



The Comparison between the Effectiveness of Two Educational Methods of Learning by Summarizing, and Learning through Teaching on the Comprehension Male Students

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Abstract

The present study was conducted to compare the effectiveness of two educational methods of learning by summarizing, and learning through teaching on the comprehension of sixth grade elementary male students. This was an applied study and the research design was experimental with a pre-test and post-test approach and the control group. The study population included all sixth grade male students at Allameh Tabataba'i School, who were studying in the academic year of 2018-2019. The random available sampling method was used in this study. The total number of students were 59, all of which were participated in the study and divided into three different groups by random convenience sampling method. Then, the first experiment group members (15 subjects) were trained in 8 learning sessions through teaching method. The subjects in the second experimental group (15 subjects) were trained in 8 learning sessions by summarizing method. The control group (n = 29) received no training. Two researcher-made questionnaires were designed to assess the comprehension level of the students. The data were analyzed using analysis of covariance in the SPSS software. Emphasizing the findings of the research, it can be argued that both learning methods had a favorable effect on the students' comprehension, and increased the students' comprehension level. Based on these findings, one can conclude that these two educational methods have a great impact on increasing the comprehension of sixth grade elementary students.

Keywords: Comprehension, elementary students, summarizing, teaching

Introduction

In drafting the National Education Document of the Islamic Republic of Iran, it is highly important to pay attention to the principle of educational justice and individual differences of students, especially in terms of learning abilities (Tousi, 2006). Psychology, as the science of studying behavior, is nowadays at the service of education more than ever to optimize the learning and education process. If we look at the ups and downs of psychology history to this day, we realize that the emergence of every approach and its changes have been aimed to study human behavior and this behavior is mainly a result of the principle of

learning. The purpose of any educational activity is to create learning (Seif, 2001).

Some consider learning to be a particular skill, while others see it as transferring scientific concepts from an individual to another. The teacher or instructor plays a key role in these definitions and the student does not show much activity, which impairs the meaningful learning matter (Huang et al., 2018). The behaviorists define learning as a change in the observable and measurable behavior, and from the perspective of the Gestalt psychology, learning is about acquiring new insights or changing the past insights (Myers, 2018). What these two definitions have in common is the issue of change. The most complete available definition of learning is provided by Hilgard and Marquise (as cited in Shabani, 2015), which is the process of relatively permanent changes

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in one's potential behavior through experience. What distinguishes this definition is the inclusion of the issues of process, relatively sustainable change, potential behavior, and experience, which are briefly analyzed in each case (Shabani, 2015).

Learning through the method of summarizing involves reproducing the main ideas of a lesson in one's own language. The students reproduce the main ideas of a lesson in their own language like when they are asked to study a history lesson and write a summary sentence in their own language for each paragraph that illustrates the important idea of each paragraph. Summarizing involves selecting the main ideas of the lesson, organizing them in a more concise cognitive format, and integrating them with prior knowledge through the reproduction of the material in the individual's own language. The effect of summarizing will reach its maximum level when the students receive instructions on how to summarize the content effectively. Summarizing can be used as a note-taking strategy for learning from a text or an educational lecture, or for topics in the social sciences and humanities as well as stories. As stated by Pressley, Symons, McGoldrick, & Snyder (1995), summarizing refers to the "Family of Strategies" that both teachers and learners can use them in a variety of ways. Also, according to the Wittrock's Generative Learning Theory (introduced in 1974 & 1989), summarizing is an effective learning strategy since it forces the student to be engaged with generative processing (Fiorella & Mayer, 2015; Nandhini & Balasundaram, 2013).

Learning through teaching involves raising the individual's level of perception of the teaching subjects, which have been already taught to others through the teaching process. For instance, after reading a scientific text, a student may enhance his perception level of the subject by explaining its important concepts to other students. Thus, the students teach others the studied lessons. To take an example, when students are asked to study a multimedia lesson on the scientific process, and then explain it to other students. Asking the students to teach, encourages them to select the most relevant information from the lesson and organize them into a coherent structure format and also integrate them with prior knowledge. According to the framework proposed by Bark and Schul (1980, as cited in Shabani, 2015), learning through teaching consists of three distinct stages that each step is presented to provide specific learning benefits. Based on a study by Resco and Chi (2007), teachers in general benefited from the advantages of attending the classmate teaching programs such as teaching to different age

groups and two-way (mutual) teaching; however, the impact of such programs can vary considerably (as cited in Fiorella & Myer, 2015; Fiorella & Myer, 2013).

The study by Pressley et al. (1995) showed that successful students use more summarizing strategies when studying, which greatly help them in remembering the contents. In this regard, Salem Safi et al. (2010) also suggest that factors such as utilized sources, study habits, learning motivation, place of study, time of study, and knowledge of study methods affect the learning process. Proper study methods reduce the study time and increase the rate of learning and help keep the content in memory for a longer time and make it easier to remember the contents.

According to Seif (2001), those learning tools of study methods are better that are also classified as memory processes into three major categories of replication and review, expansion and development, and organizing. If a student knows what to do and what skills to learn, he will overcome the difficulties despite all the external shortcomings. Different strategies will lead to different learning outcomes and different levels of success. The students who acquire some skills are more likely to succeed and consequently will insist on doing the tasks and achieving success (Seif, 2016).

Therefore, given the above content and the individual differences in learning as well as an increase in the prevalence rate of reading and learning problems in primary school students, it seems crucial and important to address which learning method can improve the comprehension skill, and in general, the reading performance and the academic progress of the students. Due to the lack of enough studies, whether domestic and foreign, in this area and the unclear precise boundary between learning by teaching and learning by summarizing, it was decided to address this issue in this research and attempted to find if there is a significant difference between the two educational methods of learning through summarizing and learning through teaching in affecting the comprehension of Allameh Tabatabai's sixth grade male students.

Method

This is an applied research in terms of objective, and an experimental research with pre-test, post-test with a control group in terms of research methodology. In this study, the dependent variable, namely the students' comprehension level, was measured before and after the implementation of the independent variable, which was the educational course of learning by teaching and learning by summarizing.

Participants

The study population consisted of all male students of the sixth grade of Allameh Tabataba'i School in Tehran during the academic year of 2018-2019. We used the random convenience sampling method in this study. The total number of students in Allameh Tabataba'i's sixth grade elementary school accounted for 59, all of whom were participated in the study. All 59 students were studied and divided into three different categories using the lottery method as follows: 15 students in the first experimental group, 15 in the second experimental group, and 29 students in the control group.

Instruments

Two researcher-made comprehension tests were used to measure the participants' comprehension level of the subjects of the selected texts. The texts used to

evaluate the students' comprehension in the pre-test and post-test were selected from world modern knowledge book series, "History of Money" and "The Genesis of the Universe and the Galaxy", suitable for the sixth grade age group. The test of these texts was made based on the specifications of the comprehension test of the content of these texts.

Procedure

The primary form for initial implementation was applied firstly. After collecting data and making final corrections, the final form of comprehension test was developed and implemented on the studied sample. The subjects of the first experiment group were trained in 8 learning sessions through teaching method, while the subjects in the second experimental group were trained in 8 learning sessions by summarizing method. The control group received no training. The brief contents of these sessions are as follows:

Table 1.

The Summary of the Content of Each Training Session by Learning through Summarizing

Session 1	Introducing and interacting with the subjects, motivating them and explaining the aims of the research, implementation methodology, the importance of understanding and applying the strategies of learning through summarizing
Session 2	Familiarizing the subjects with the summarizing method as one of the learning methods and the basic techniques of summarizing method and giving a brief explanation of how to find the main ideas of the text
Session 3	Teaching how to remove unnecessary subject material and the removal of additional subject material
Session 4	Teaching how to write a word instead of a list of items
Session 5	Writing a word instead of parts of an action or practice
Session 6	Teaching how to find the famous sentence
Session 7	Teaching how to create the famous sentence if no famous sentence existed
Session 8	Summarizing, repeating, and reviewing contents that has been taught in previous sessions and addressing possible problems

Table 2.

The Summary of the Content of Each Learning Session by Teaching Method

Session 1	Introducing and interacting with the subjects, motivating them and explaining the aims of the research, implementation methodology, the importance of understanding and applying the strategies of learning through teaching
Session 2	Familiarizing the subjects with the teaching method as one of the learning methods and the basic techniques of teaching method
Session 3	Teaching how to select the most relevant information from the lesson to include in one's descriptions
Session 4	Training how to organize the selected contents from the text in a coherent structure
Session 5	Training how to integrate the selected and organized contents from the text and explain them aloud to the classmates
Session 6	Teaching the interaction between the student as a teacher with other students as well as answering to other students' questions
Session 7	Practicing educational content from previous sessions and applying the teaching method to only one classmate
Session 8	Summarizing, repeating, and reviewing content that has been taught in previous sessions and addressing possible problems

The descriptive statistics (calculation of center-tendency indices and variability indices) and inferential statistics (covariance analysis) were used to analyze the data. In addition, the SPSS software was used to perform various steps of statistical computation and data analysis.

Findings

After conducting preliminary studies and formulating research design and hypotheses, the researcher tested her hypotheses through collecting evidence using valid

and reliable tools; after analyzing the results, it becomes clear that the research hypotheses are rejected or confirmed. In the present section, the data collected from the studied subjects through the comprehension questionnaire were analyzed using appropriate statistical techniques and the research hypotheses were tested. To this end, the descriptive statistics indices were used to describe and classify the collected data. Also, the multivariate analysis of covariance was used to test the hypotheses.

Table 3.

Descriptive Statistics Indices of Comprehension in Terms of the Experimental Variable Levels

Tests	Groups	Minimum	Maximum	Sample Mean	Standard Deviation	Standard Error	Skewness
Pre-test	Control	13	28	21.83	3.67	0.68	-0.046
	Teaching	17	28	22.00	3.23	0.83	-0.01
	Summarizing	16	28	22.00	3.34	0.86	-0.07
Post-test	Control	21	29	25.24	2.23	0.41	0.09
	Teaching	28	35	32.07	2.09	0.54	-0.65
	Summarizing	27	33	30.00	1.81	0.47	0.33

As can be seen in Table 3, the descriptive statistics indices of comprehension are clear. The mean and standard deviation of comprehension of teaching group in the post-test (32.07) have increased compared to the pre-test (22). The same can be said about the method of summarizing as the mean of comprehension in the pre-test has been 22, which has increased to 30

in the post-test. The important point in the information in the table above is that the mean of variable of comprehension in the experimental groups (teaching – summarizing) has increased in the post-test compared to the pre-test; but the standard deviation has decreased.

Table 4.

The Statistical Indices of Levene's Test with the Assumption of Equality of the Post-test Variances in the Experimental and Control Groups

Levene's test	Degree of freedom of the numerator	Degree of freedom of the denominator	Significance level
0.493	2	56	0.614

The post-test variance equality in the experimental (teaching – summarizing) and control groups is measured by the Levene's test. When the significance level of the test is greater than 0.05, the assumption of equality of variances is confirmed and the researcher is allowed to use the multivariate analysis of covariance test. According to the results of Table 4, as the

significance level of Levene's test in the post-test of the examined variable is greater than 0.05, then, the assumption of equality of variances is confirmed. Therefore, we can firmly conclude that there is no significant difference between the variances of comprehension variable in the post-test.

Table 5.

The Statistical Indices of Kolmogorov-Smirnov Test (with the Assumption of Normality of Distribution of Error Scores)

Normal Parameters	Mean	0.000
	Standard Deviation	0.965
Maximum difference level	Absolute	0.063
	Positive	0.049
	Negative	-0.063
Kolmogorov-Smirnov		0.063
Significance level		0.2

The results of the normality of error scores distribution in the studied variables are reported in Table 5. According to the results of this table, as the significance level of Kolmogorov-Smirnov test in reading comprehension is greater than 0.05, thus, the

zero hypothesis (the normality of the error scores distribution) is confirmed.

Research Hypothesis: The educational methods (teaching, summarizing, and without teaching) are effective on the comprehension level of sixth grade elementary male students.

Table 6.

The Inferential Statistics Indices Used to Calculate the F-test

Sources of change	Sum of squares	Df	Mean of squares	F test	Significance level	Eta squared
Pre-test effect	32.39	1	32.39	8.33	0.006	0.132
Experimental variable	519.97	2	259.99	66.87	0.000	0.709
Error	213.85	55	3.89	---	---	---
Modified total changes	772.95	58	---	---	---	---

According to the results of Table 6, as the F value calculated for the effect of experimental variable (8.33) is higher than the critical value of F with degrees of freedom of 2 and 55 and the significance level of $P < 0.01$, thus, the null hypothesis is rejected in the case of this variable. Given the rejection of the null hypothesis, we can conclude with 99% confidence that there was a significant difference between the two educational method of teaching, summarizing, and the control group in the studied sample. There was a significant difference between the control and

experimental groups in the post-test, in the mean values of comprehension of sixth grade elementary male students at. According to Kuhn (1988, as cited in Rezaie, 2014), the Eta squared indicates the effect size. In his opinion, when the effect size exceeds 0.14, its value is high.

The result of F test suggests that there is a significant difference between the mean values of comprehension according to the educational method. The Bonferroni test was used to determine the paired comparisons.

Table 7.

The Comparison of Mean Values of Comprehension Based on the Educational Method as Pairwise through the Bonferroni Test

Variable	Group	Mean	Comparison of means	Mean difference	Standard error	Significance level
Comprehension	Control	25.26	Control Teaching	-6.79	0.63	0.001
	Teaching	32.05	Teaching Summarizing	-4.72	0.63	0.001
	Summarizing	29.98	Teaching Summarizing	2.07	0.72	0.02

The comparison of the mean comprehension according to the educational method in the table above can be mentioned in the form of three sub-hypotheses:

A. The comparison of mean comprehension of educational methods of teaching group with the summarizing group:

According to the results of Table 7, since the significance level of the Bonferroni test in this comparison is smaller than 0.05, then, the hypothesis is rejected. Given the rejection of the null hypothesis, we can conclude that there is a significant difference between the mean of the comprehension of the

teaching method and summarizing method. The following table provides additional information to compare the educational methods of teaching with summarizing in the pre-test and post-test of the comprehension variable through the independent t-test.

Table 8.

The Inferential Statistics Indices Used to Calculate the Independent t-test

Variable	Component	Levene test for equality of variances		Mean difference	Standard error	Independent t-test	df	Sig
		F	Sig.					
Comprehension	Pre-Test	0.00	1.00	0.00	1.20	0.00	28	1.000
	Post-Test	0.22	0.65	-2.07	0.71	-2.90	28	0.007

According to the results of Table 8, as the calculated absolute value of t of the comprehension in the post-test is greater than the critical value (t with a degree of freedom of 28 and a significance level of $P < 0.05$), then, the null hypothesis is rejected. Given the rejection of the null hypothesis, one can conclude with 95% confidence that there is a significant difference between the mean comprehension values of teaching method and summarizing method. It should be noted that the results of the independent t test are consistent with the results of the Bonferroni test. This difference is not significant for the pre-test.

B. The comparison of mean comprehension of teaching educational method with the control group:

According to the results of Table 8, since the significance level of the Bonferroni test in this comparison is less than 0.05, then, the null hypothesis is rejected. Given the rejection of the null hypothesis, it can be concluded that there is a significant difference between the mean comprehension of the teaching educational method and the control group.

C. The comparison of mean comprehension of summarizing educational method with the control group:

According to the results of Table 8, since the significance level of the Bonferroni test in this comparison is less than 0.05, then, the null hypothesis is rejected. Given the rejection of the null hypothesis, it can be suggested that there is a significant difference between the mean comprehension of the summarizing educational method and the control group.

Discussion and Conclusion

Statistical analyses showed that training by teaching method had an impact on the students' comprehension level. These findings are in line with the studies done by Khadivi, Aqdasi, and Samdian (2012), Dunlosky et

al. (2013), and Derossis et al. (2004). In explaining this finding, one can say that reading and comprehension skills are among the most important learning needs of students. Comprehension, including understanding the texts and interpretation and inference from textbooks and non-textbooks, introduces students to new ideas and information and teaches them how to think and live better. In this regard, the National Assessment of Educational Progress of US has conducted some studies on reading comprehension, which display only 30 to 40 percent of fourth to sixth grade students are above average regarding the reading and comprehension skills. Therefore, it seems obvious that the students without reading skills cannot understand the concept of the text independently and autonomously at first. For the same reason, the inability to read and comprehend hinders academic progress more than other specific learning problems in different areas. Derossis et al. (2004) mentioned in their study that the major problems of students in the area of studying habits as time management, planning for reading, and the ability to read and comprehend. Hence, through education by teaching method, we can enhance reading and comprehension skills in students so that they can be able to study the subjects more accurately and learn the content in a more desirable way. For in training by teaching method, the teacher helps the student understand the contents, and if the content is difficult for him, the teacher reduces the amount of unclear material to the student by emphasizing learning through teaching to make it easier for the student to understand the contents. Obviously, these trainings will increase the learners' motivation to learn more and the combination of these factors helps them improve their academic performance.

The statistical analyses revealed that the education by summarizing method is also effective on their comprehension. These results are consistent with the findings of Cartwright (2002), Haghverdi et al. (2010), Ali Bakhshi and Zare (2010), as well as Sharifi and Rahmati (2012). In explaining these results, we can argue that one way to create interest and motivation in learners is to improve learning conditions and increase the quality level of teaching methods since the learners will achieve more success in learning by this method and this success achievement increases their interest and motivation to learn new things. In this regard, based on Sharifi and Rahmati's research (2013), one of the most important problems of the educational system to be addressed is the lack of formal teaching of note-taking skills to pupils and students. According to studies conducted on human memory, after about twenty minutes, humans forget almost 40 percent of what they heard or read, and after 24 hours, they almost forget about 70% of the content (Reeder, 2010). Therefore, one can say that, given the widespread use of students at different levels of education of note-taking as well as its enormous impact on the teaching matter and teaching-learning process, it seems that basic teaching of note-taking and writing skills to learners of different levels can guide them to the issue that simultaneously with being a good writer, one can also be a good listener and one can take high-quality and key notes at the minimum time, which will greatly help to further understand of the read contents. This in turn has a positive impact on learning and comprehension and gives students the belief that they can handle tasks and do everything successfully, including understanding the contents and learning lessons. This leads to increased motivation in them.

Thus, relying on the results of the present study, it can be suggested to hold special courses in schools for teachers focusing on training different teaching methods, including learning through teaching and learning by summarizing professionally so that they can reduce the students' comprehension problems by properly transmitting these techniques to the students and increase their academic performance and motivation. Like other research, this research has had some limitations, including failure in fully cooperation of the sample members. Also, since these methods are practiced intuitively as usual and common methods, and without theoretical and empirical basis, training them with correct, accurate, and scientific methods encountered many problems.

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