Effect of the verbal mnemonics on students’ achievements and their attitudes

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Abstract

In this study the effects of the instruction of Science and Technology, which is based on the verbal mnemonics, on the learning products has been searched. In this study experimental method’s 1 has been used. Study has been conducted with two fifth grade classes which are equal to each other with their scientific and cognitive entre behaviour. Totally 66 pupils have participated to this study. At the control group normal educational activities have been practised as foresighted. At the experimental group education and instruction have been continued with the materials which supported and based on the verbal memory.

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1. Introduction

As a social being, human is always in a relationship with the environment. The human tries to learn about the environment and to be oriented to it. The effort of human to understand the living environment is as old as the history of human. In this process human tries to understand the changes and developments around first. Today these changes and developments occur dizzily. So information is not stable but always positive. In such a system, the individual should be in a position that can produce solutions for the problems of the developing world, question and that can make the human active rather than existing learning. Otherwise the stored, stable knowledge of the individual can take the individual only to a certain extent. Thus the need for education is inevitable in terms of facilitating the orientation of the individual to the environment.

When many definitions on education are analyzed, it can be seen that term terminal behavior often takes place in many of them. For the achievement of terminal behaviors stated in these definitions, planned and programmed implementations are required. Curriculum; is the mechanism of learning experiences provided to the learner though the planned in and out of the school (Demirel 2008). Curriculum can be defined as “a dynamic integrity comprising the targets planned to be observed on the individual and the regular education and testing conditions that can realize them” (Sönmez, 1993).

Learning is the permanent changes occurring on the behaviors as a result of interaction (experience) of the individual, according to his maturation level, with the environment (Büyükaragöz, Çivi, 1997: 38). According to another definition, learning is the changes occurring on the behaviors of the individual as a result of the changes
occurred on the mental structures of the individual (Eggen, Kauchak, 1999). Teaching which means the guiding of education is the whole of the processes applied for the realization of learning and the development of the behaviors required for the individual (Büyükar argöz, Çivi, 1997). In the number of the studies related to the planning of teaching process, an increase has been observed. Especially the studies in the area of cognitive psychology take more place than the studies in the area of behavioral psychology. According to modern approaches learning in this process; is a more complicated process than the relation of stimulant-reaction relation. This process comprises the cognitive processes including the comparison of previous information with the new obtained with stimulants, storing of the information obtained in the memory and then recalling of this information (Ülgen, 1997; Senemoğlu, 2007).

According to the information processing theory, human gets the information from the outer world, processes, changes its form and content, stores, recalls when required and creates reactions (Ulusoy ve diğ., 2006). The theorist of information processing defines learning as the process in which the stimulants got from the environment are made meaningful, stored, recalled for using and converted into behavior (Fidan, Erden; 1993). Human mind resembles to computers in terms of this function.

The statement “people are like data processors” is summarized by the information processing process itself. According to information processing theory, learning includes processing the structure in the cognitive symbols with the cognitive processes (Mayer, 2008: 168).

Information processing theory mainly aims to answer the following four questions:

- How is the new information taken from the outer world?
- How is the new information processed?
- How is the new information stored in the long term memory?
- How is the stored information recalled? (Senemoğlu, 2007: 266)

Scientists have tried to understand the functions and working of the mind within the scope of these four questions.

Two main components of the information processing theory draw attention. The first one is the sensory reception, short term memory (working memory) and long term memory which are storing units. The second one is the cognitive processes. Cognitive processes are internal, mental actions that allow the information to be transferred from one structure to another.

It can be said on memory and learning that left hemisphere abilities have been focused on and adequate importance has not been given to activities such as dreaming, fantasy, music and art. Thus one of the most important features of memory has been neglected. To restore the memory, the use of special memory support techniques developed by ancient Greeks in respect of activating all brain skills (by inspiring from Greek memory goddess Mnesmosyne) and called mnemonic, can be useful. Memory supports facilitating learning and recalling of the learned, are actualy methods that have been used for thousands of years. For example, it has been known that the use of loci method, one of the most effective memory supporting methods during rhetoric teaching was taught in Romans period (Ün, 1984; Higbee, 1996 Bel ezza, 2004; Svan tesson 2004).

It is also possible to compose the memory supports by coding the verbal symbols. In these techniques arrangements are made with the help of intonation. Memory supports composed of verbal symbols are divided into two groups:

- First letter arranging strategies
- Rhyme composing strategies

When the studies performed on related field are analyzed, it has been seen that memory supports contribute to the learning of new concepts and recalling of learned information. In this research, the effect of Science and Technology teaching based on verbal memory supports on the products of learning has been analyzed.

2. Method

2.1. Participants
The research was performed on the 5th grade students of Hasanpasa elementary school in Sultanbeyli county of Istanbul in 2009-2010 education years. Five classes in the school had been analyzed, 4th grade year end marks of these classes had been examined and the ages of the teachers and years of their experiences in education had been compared before the application. In the result of these comparisons, it was determined that 5/A and 5/B classes are close to each other in terms of this data. In the findings obtained in the preliminary tests performed before the application, it was concluded that the two groups were equal. 32 students were selected from 5/A as the control group and 34 students from 5/B as the experiment group at random.

2.2. Experimental Process

Achievement test and attitude scale was performed on control and experiment groups as preliminary tests. These applications were performed by the researcher before the start of education activities. Learning-teaching process related to the given courses was performed by the researcher in the control and experiment groups.

In the control group the courses were given in the scope of the activities stated in the elementary education program. In-course activities are composed of the activities taking place in the current guide books. Besides, similar activities were used with the experiment group. In the experiment group, course plans were made including verbal memory supports. The courses were continued with the plans prepared by the researcher. In these plans, the verbal memory supports were presented sometimes at the end of the course and sometimes following the newly learned concepts, according to the subject field and type of the information presented.

2.3. Data collection tool

In the research, Science and Technology Course Achievement Test and Attitude Scale for Science and Technology Course were used as data collection tool. Validation and reliability studies were performed about the achievement test and the test was composed of 25 clauses. Likert type scale, composed of 20 clauses and developed by Akinoglu (2001), for Science and Technology Course was used as attitude scale.

3. Results

In this part, assessment instruments and data obtained from researches were analyzed through suitable statistical methods. Findings will be presented as tables.

| Grade          | Test    | N  | X     | ss   | Shx | t Test |
|----------------|---------|----|-------|------|-----|--------|
|                | Pre test| 32 | 44,63 | 11,77| 2,08 |        |
|                | Post test | 32 | 53,63 | 18,17| 3,21 |        |
| Control Group  | Pre test| 34 | 44,82 | 12,79| 2,19 | -2,30  |
|                | Post test | 34 | 63,30 | 18,54| 3,18 | 33,000 |
| Experiment Group | Pre test | 34 | 44,82 | 12,79| 2,19 |        |
|                | Post test | 34 | 63,30 | 18,54| 3,18 | 33,000 |

In the table, results of the t test performed to determine whether the achievement test grades of control and experiment group students differ according to the preliminary test- final test variable are seen. In the result of the matched group t test, the difference between the averages is considered as statistically significant. The said difference occurred in favor of the final test.
Table 2. Comparison of achievement test and final test grades of experiment and control groups

| Grade                  | Groups  | $N$ | $\bar{X}$ | $s$ | $S_b\bar{X}$ | $t$ | $Sd$ | $p$ |
|------------------------|---------|-----|------------|-----|--------------|-----|------|-----|
| Achievement test       | Control | 32  | 53,63      | 18,17 | 3,21         | -2,14 | 64  | 0,036 |
|                       | Experiment | 34  | 63,29      | 18,54 | 3,18         |       |      |      |
| Final test grades      | Control | 32  | 53,63      | 18,17 | 3,21         | -2,14 | 64  | 0,036 |
|                       | Experiment | 34  | 63,29      | 18,54 | 3,18         |       |      |      |

As it is seen in the table, the final test grades on the achievement tests of control and experiment groups are compared. Results of the t test performed to determine whether the final test grades of control and experiment group students differ according to the control and experiment group variable are seen. In the result of independent t test, the difference between the arithmetic averages of the groups is considered as statistically significant ($t=-2,14; p<0,05$). The said difference occurred in favor of the students in the experiment group.

Table 3. Comparison of the final test grades of attitude scale of experiment and control groups

| Grade                  | Groups  | $N$ | $\bar{X}$ | $s$ | $S_b\bar{X}$ | $t$ | $Sd$ | $p$ |
|------------------------|---------|-----|------------|-----|--------------|-----|------|-----|
| Attitude test          | Control | 32  | 76,97      | 12,51 | 2,21         | -2,26 | 64  | 0,027 |
|                       | Experiment | 34  | 85,06      | 16,24 | 2,78         |       |      |      |
| Final test grades      | Control | 32  | 76,97      | 12,51 | 2,21         | -2,26 | 64  | 0,027 |
|                       | Experiment | 34  | 85,06      | 16,24 | 2,78         |       |      |      |

As it is seen in the table, the final test grades on the attitude scale grades of control and experiment groups are compared. Results of the t test performed to determine whether the final test grades of control and experiment group students differ according to the control and experiment group variable are seen. In the result of independent t test, the difference between the arithmetic averages of the groups is considered as statistically significant ($t=-2,26; p<0,05$). The said difference occurred in favor of the students in the experiment group.

4. Conclusion

Due to the spiral program applied in elementary education programs, students develop the information of the same learning domain more in the next education term. In this study it is seen that the average of the grades achieved by the students in preliminary test level are considerably high. The high level of averages also shows that the information to be learned overlaps with the information remembered from the previous year. Consequently the attainment of certain information by the students who previously did not have the same information caused a significant increase between the preliminary and final tests in the control and experiment groups of the students. When the achievement test final test grades related to the Unit “Let’s Learn about the World of Living Creatures” of Science and Technology course of the experiment and control group students were compared, a significant difference was seen in the favor of experiment group. It is possible to say that this difference occurred as a result of the different teaching techniques applied in the experiment group.

Through the applied verbal memory supports, it became easy to recall the learned information. Science and Technology course, especially the related unit includes many verbal concepts. It was thought that memory supportive strategies would be effective in the learning of this verbal information. Erden and Akman (1996) have stated that memory supports can facilitate the learning of verbal information.

In the analysis of the attitudes, it is possible to say that attitudes are a complex process and takes time to change. This feature should not be neglected for elementary grade students. The changes of applied technique, method or teacher take effect on the student from the first day and affect the student. In the event that the class teacher is changed, the student gets prepared to the lesson more carefully if he/she does not encounter with a very important problem. This situation is showed by the class teachers clearly with the attending of branch teacher in 4th and 5th grade. In the result of the research, an increase, even small, even if it is not considered as significant in the control group students, can be considered as the result of the change of the teacher. But
this result which occurred in favor of the experiment group students can be explained by the further applied techniques and memory supportive strategies.

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