

Effect of Mind Mapping Technique on Learning Success in Teaching Substantive Verbs in Turkish Language Education

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ABSTRACT

In the current study, the effect of mind map technique on the teaching success of substantive verbs is researched. To this end, pretest, post-test paired control group design was used. The study group of the study consisted of 48 students in 7/A and 7/B classes in a secondary school affiliated to the Directorate of National Education in the Province of Balıkesir. In the research, a pretest was applied to evaluate the level of knowledge on the acquisition of "S/he uses substantive verbs in accordance with their functions". Following the pretest application, mind map technique regarding the above- mentioned acquisitions in line with daily plans was administered in the experimental group; however, four weeks of practice was applied through the activities in the textbook using the lecturing method and, then, post-test was administered to determine the learning level. After 21 days from the post-test, permanence test was applied. Based on the research findings, to what extent the above- mentioned technique contributed to the teaching of substantive verbs was intended to be revealed. Mann- Whitney U Test was utilized to analyse the pretest scores of experimental and control groups; Dependent Variables T Test to analyse pretest, post-test scores of experimental group and Wilcoxon Signed- Rank Test to analyse the difference between pretest and post-test scores of the control group. Furthermore, Mann- Whitney U Test was used to analyse the difference between post-test scores of the experimental and control groups; dependent Variables T Test to analyse the post-test scores of experimental group and permanency test scores and Wilcoxon Signed- Rank Test to analyse the post-test scores of the control group and permanency test scores. The results showed that the use of mind map technique contributed to the student achievement, learning permanence, and the teaching of substantive verbs. It has been thought that the inclusion of this technique in the lessons by Turkish language teachers will increase the success of the course and the learning permanence. From a wider perspective, it will contribute positively to student's literacy skills.

Key words: Mind Map, Grammar, Substantive Verb, The Teaching of Turkish Language

INTRODUCTION

Language teaching encompasses multifaceted processes addressing different skills such as listening, speaking, reading and writing. Grammar makes significant contributions to developing the skills to discover, understand and express the functions of language. Through the teaching of grammar, the skills and knowledge, at the subconscious level, related to the grammar of the mother tongue that student have intuitively learnt are raised to the level of consciousness and the students are encouraged to understand and explain their feelings and thoughts more precisely and completely. Therefore, grammar teaching is necessary to support literacy skills. Otherwise, the child who is not able to grasp grammatical codes of his/her mother tongue is likely to have difficulty in comprehension and expression and encounter certain obstacles in literacy skills. Research by the European Union

supports this idea and shows that grammar teaching is effective in improving literacy skills (Banguoğlu, 1990; Demirel, 2002; Güneş, 2013; Onan, 2005; Onan, 2012, Tompkins, 1998). Başkan (2019) examined the relationship between students' grammar proficiency and writing skills and concluded that the proficiency in grammar has a significant effect on writing skills in a positive way. This shows that grammar education is necessary to support literacy education. Likewise, in Turkish language curriculum, grammar is addressed with an approach that supports reading, listening, speaking and writing skills (MEB, 2019).

Grammar is the set of regularities determined by the studies aimed at observing, classifying and recognizing the structures of the language used by individuals in the processes of comprehension and explanation, rather than the rules of a certain language applied within the framework

of the rules established by linguists. The problems concerning the method applied in the teaching of grammar are the problems that are encountered in the field that need to be addressed. The methods and techniques applied generally lead the students to memorization and prevent them from comprehending the relationship between linguistic structures, causing the acquired knowledge and skills to be forgotten within a short while (Aksan, 2015; Çifci, 2004; Erdem, 2011; Heyet, 2009; Karahan, 2010; Korkmaz, 2007; Şahin, 2001).

It has been seen that as the perceptions regarding how learning occurs change, these are reflected in grammar teaching. According to behaviourist theory, learning was considered in the context of a simple stimulus- response. Therefore, memorization and repetition were indispensable elements of teaching grammar. Today, it has been seen that behaviourist theory falls behind explaining the realization of learning. Nowadays, in learning, the key is not memorization; instead, it is the meaningful construction of knowledge. Chomsky advocated the cognitive approach, opposing behaviourist theory. The cognitive theory, unlike the behaviourist approach, does not explain language learning in terms of stimulus- response relationship superficially. It associates language acquisition with perceptual and mental learning principles. Instead of rules, it is related to the functions of language and attempts to generate rules concerning them, avoiding memorization (Demir and Yılmaz, 2012; Güneş, 2011; Karatay et al., 2011; Mete et al., 2022; Musaoğlu, 2004; Onan, 2017; Sarıçoban, 2004; Savaş, 2006; Selvi, 2019; Thornbury, 2013; Tura, 2018). According to Ausubel (1968), to whom meaningful learning is attributed, learning strategies reflect the inner processes of the individual. Although learning based on repetition may be effective in the short term, the information that is acquired is unlikely to be fully understood due to the inability to build association between the information and is forgotten after a while.

The afore-mentioned views on language acquisition have also directly influenced the teaching of grammar. Today, with the constructivist approach that emphasizes meaningful learning, the behaviourist theory has lost its importance. It is no longer necessary to memorize in learning, instead, to construct knowledge in a meaningful way. Along with the constructivist approach, novel methods and techniques have emerged. The mind map technique, one of those techniques, was developed by Tony BUZAN (Buzan and Buzan, 2020). The mind map technique was generated as a result of inadequacy and inefficiency of linear note- taking techniques. At the heart of the mind map technique is the association of concepts and pictures through free association and the visualization of these concepts. During the application of the technique, A3 or different sizes of oversized unpatterned paper to be used as a backdrop is positioned horizontally. A topic or main idea is determined in the middle of this paper and written in capital letters. Then, the key words or ideas associated with it are shown and noted through branches spreading from the center outward. When noting, keywords or

ideas are supported by visuals such as clip art, symbols and signs that are evoked in individual. The relationships between ideas or concepts are indicated by links or signs to be drawn between branches (Buzan, 2005; Goldberg, 2004; Parikh, 2016; Rustler, 2012).

Unlike other note- taking techniques, the mind map technique is based on the concretization of expansionist thinking that is appropriate for the functioning of the brain and on the active use of both lobes of the brain and adopts the principle of free association. Placing the keywords of the relevant information on the horizontally- positioned paper in connection with the words to which they are related ensures that the idea is concretized and the information is more meaningful. The keywords, relevant visuals and words related to the senses ensures that both lobes of the brain are actively used in conformity. Through free association, the student determines the keywords associated with the information learnt. Therefore, each mind map created on the same subject varies. Thus, at the end of the process, original works are generated by the student and creating thinking is supported. A concrete representation of the relationships of keywords with signs and connections also provides the opportunity to construct information in a meaningful way (Buzan and Buzan, 2020).

It has been shown that traditional methods and techniques used in Turkish language course fall behind acquiring the expected efficiency in teaching of grammar. It is seen that this is the case in substantive verbs teaching. Previous research indicated that the use of methods and techniques that are in line with constructivist approach ensures higher levels of benefit in supporting language skills compared to grammar (Güneş, 2013). For this reason, mind mapping, which is a teaching technique suitable for the constructivist approach, was chosen in our study. It is thought that the technique will contribute to success and permanence in teaching substantive verbs. Progress will also indirectly support literacy skills.

Objectives and Research Questions

The research question is “Does the use of mind map technique in the teaching of substantive verbs have an effect on course achievement and permanence of learning?” and answers to the following questions have been sought:

1. Are the scores of the experimental and control groups on the subject of the substantive verb similar before the implementation?
2. Is there an increase in the substantive verb success of the experimental group after the implementation?
3. Is there an increase in the substantive verb success of the control group after the implementation?
4. Are the scores of the experimental and control groups on the subject of the substantive verb similar after the implementation?
5. Is permanence ensured in the experimental group after the implementation?
6. Is permanence ensured in the control group after the implementation?

METHOD

Research Model

The present study is designed with pretest, post-test control group which is a semi- experimental research design. Semi experimental research designs follow experimental research designs in terms of scientific value. Semi experimental research designs are used in certain cases where the controls required by experimental designs cannot be ensured or even when they are not sufficient. Semi- experimental research designs should be considered as the 'the best possible' and evaluated as such. Instead of abandoning the use of this design by focusing on certain controlling difficulties, this design should be widely utilized where experimental designs are unlikely to be applied, provided that their limitations are taken into account (Campbell and Riecken, 1968; Fraenkel and Wallen, 2006; Herzog et al., 2019; Gribbons and Herman, 1996; Karasar, 2012). Random method cannot be used in paired designs. In this design, two of the groups are tried to be matched through certain variables. Paired groups are randomly assigned to the groups. However, matching does not ensure that the groups included in the research are equivalent. This is an important limitation, yet an alternative when random method is not possible (Büyüköztürk et al., 2012).

Study Group

The study group of the study consisted of 48 students in 7/A and 7/B classes in a secondary school affiliated to the Directorate of National Education in the Province of Balıkesir. The researcher works in this school, therefore, convenient sampling method was used in the present research. Convenient sampling method is a sampling method in which the researcher prefers the study group, which allows saving time, effort and cost for collecting data (Büyüköztürk et al., 2012).

Due to the fact that the subject of substantive verbs was included in the 7th grades as required by the curriculum, the present study was carried out with 7th grade students. Within the framework of the principle of easy- accessibility, 7/A and 7/B classes that were formed as natural groups were determined as study groups. The main principle for experimental studies is the random placement of subjects in groups. Nevertheless, there may also be experiments where random assignment is not possible or such a process is not allowed. For example, it may not be possible for the school administration to allow the researcher to create new groups of students from different classes. In this case, the researcher can work on existing groups and experimental study can be conducted by selecting two of the existing groups (Büyüköztürk et al., 2012). Random method was employed for the students in 7/A and 7/B classes and 7/A class was determined as the experimental group and 7/B as the control group.

Data Collection Instruments

In the study, the achievement test on the substantive verbs prepared by the researcher was used as a data collection instrument. It is appropriate to utilize knowledge tests when it

is intended to reveal what individuals know about a certain subject, to what extent they know, from which channel they learn it and when they learnt it for the first time (Balcı, 2010).

The researcher prepared an achievement test for the acquisition of "*S/he uses substantive verbs in accordance with their functions*" (MEB, 2019, p.46) included in 7th grade curriculum and it was used as pretest, post-test and permanency test. In order to determine the grammar subject for which the mind map technique is to be used, the study by Topal and Çifci (2021) entitled "The Difficulty Level of 7th Grade Turkish Language Course Acquisitions" was utilized. In the research, in which questionnaire was used, it was found that Turkish teachers had difficulty in having their students acquiring the acquisition of "*S/he uses substantive verbs in accordance with their functions*" (MEB, 2019, p.46) included in 7th grade curriculum. Therefore, the questions in the pretest, post-test and permanency test consisted of questions regarding this acquisition.

The achievement test comprised of matching, fill in- the- blanks, multiple choice and open- ended questions. The multiple choice questions in the prepared tests were selected from EBA (Education Information Network) and ODSGM (The Directorate of Measurement, Evaluation and Examination Services). Split- half reliability was used for the reliability concerning internal consistency. In this method, reliability is estimated for the entire test based on the correlation between the scores obtained from the two identical (parallel) forms of the test (Büyüköztürk et al., 2012). The reliability coefficient for the entire test was calculated by the formula described by Spearman- Brown (Özer Özkan, 2019). Following the analysis, it was seen that the reliability coefficient of the test was 0.82 and internal consistency was ensured.

The scoring was made by two field experts other than the researcher in line with the prepared rubric. The necessary corrections were made on the rubric prepared by the researcher by consulting three field experts in the field of Turkish language education.

The Krippendorff's Alpha coefficient was computed for the reliability between raters. The Krippendorff's Alpha coefficient is a statistical measure of the extent of agreement among raters. It is less affected by the number of raters compared to other statistics. This statistical measure can be used where there are two or more independent raters and can be applied to different types of data (Bıkmaz Bilgen and Doğan, 2017). The analyses showed that the Krippendorff's Alpha coefficient was $\alpha=1$ and the reliability between raters were compatible. It was found that there was no differentiation between independent raters due to the fact that the scoring was made in line with the rubrics and the matching, fill in- the- blanks, multiple choice and open- ended questions in the tests were not suitable for interpretation.

The opinions of five experts were consulted to ensure the content validity of the test. Lawshe's method was used for assessing content validity. It is important to determine whether the items in the scales are sufficient to address and collect the expert opinion and the phenomenological and/or judicial data required. In this regard, various techniques have been

developed to determine the content validity. The Lawshe's method is remarkable thanks to its simplicity and usefulness. In this method, it is aimed to convert the data obtained by calculating the content validity rates and content validity indices into quantitative data (Yeşilyurt and Çapraz; 2018). The content validity rate is computed for each item and their mean gives the researchers the content validity index. In case the number of experts are between 5 and 7, the content validity index (CVI) is required to be higher than 0.99 in order to the content validity to be significant at $\alpha=0.05$ (Yurdugül, 2005). In accordance with the expert opinions received, the items with a content validity rate of less than 0.99 were eliminated and the scale was finalized. The content validity indices of remaining items are 1. It was revealed that the scale was significant at $\alpha=0.05$ level and the content validity was ensured (CVI > 0.99).

Data Collection

Daily plans were prepared by the researcher for teaching and administering the technique to the students to be applied in the course. Three field experts were consulted for the content validity of the daily plans prepared. Through the feedback from the experts, necessary corrections were made on the plans and the plans were made prepared for implementation.

The implementation process of the research is 6 weeks in total, as two lesson hours weekly. In this process, the first two weeks in the experimental group are allocated to the teaching of the technique and sample applications. Then, an achievement test regarding the acquisition of "*She uses substantive verbs in accordance with their functions*" (MEB, 2019, p.46) was applied to the students as pretest. Following the pretest application, mind map technique regarding the above-mentioned acquisitions in line with daily plans was administered in the experimental group; however, four weeks of practice was applied through the activities in the textbook using the lecturing method and, then, post-test was administered to determine the learning level. After 21 days from the post-test, permanence test was applied.

Data Analysis

The data obtained from the research were analysed through SPSS (Statistical Package for Social Sciences) for Windows 17.0. Percentages and means were used as descriptive statistical methods for assessing the data.

The achievement tests applied to the students as pretest, post-test and permanency tests were scored by two field experts in addition to the researcher. Scoring was carried out in accordance with the rubrics. For scoring, the mean of the scores of the questions by the two field experts was computed.

The Shapiro- Wilk Test was used to determine whether the obtained data showed normal distribution. The Shapiro- Wilk Test is a powerful test that assesses the assumption of normality. Since the number of participants in the experimental group was less than thirty people, this

test was decided to be used. Ahad et al. (2011) state that the Shapiro-Wilk Test give strong results when the number of sample is not high.

Mann-Whitney U Test was employed to determine whether there was a significant difference between the total scores of the pretest of the experimental and control groups and to reveal whether there was a significant difference between the total scores of the post-test of the experimental and control groups. The Mann- Whitney U Test is a non- parametric alternative to t- test and allows deciding whether the distributions of two independent sample measurements differ significantly from one another. This test is generally applied in case of breaking of the homogeneity count of the sample variances of the t- test (Balci, 2010).

The Dependent Samples T test was used to determine whether there was a significant difference between the total scores of the pretest and post-test of the experimental group and to reveal whether there was a significant difference between the post-test and permanency test of the experimental group. The Dependent Samples T Test can be used to compare the scores of two measurements applied to the same group. In such a measurement, pretest and post-test are administered to the research group and interpreted on these test results (Cansoy and Türkoğlu, 2019).

Wilcoxon- Signed- Rank Test was used to determined whether there was a significant difference between the total scores of pretest and post-test of the control group and whether there was a significant difference between the total scores of the post-test and permanency test of the control group. The same test was applied to measure the significance between the pretest and post-test scores of the control group. "*The Wilcoxon- Signed- Rank Test is used to test whether the distributions of the scores of the two associated samples show significant difference*" (Balci, 2010, p. 259).

FINDINGS

The total of 48 students participated in the study. Of all the participants, 24 (50%) were in the experimental group and 24 (50%) were in the control group. 45.8% (11) of the students in the experimental group were male and 54.2% (13) were female. Of the students in the control group 54.2% (13) were male and 45.8% (11) were female (Table 1). In the research, naturally-formed groups were used.

In order to determine which analysis methods are used for the data obtained in the study, it was investigated whether the data were distributed normally. Shapiro- Wilk Test was carried out since the students in the experimental and control groups were under thirty people.

Table 1. Frequency and percentages of the students in experimental and control groups

| Groups | Experimental Group | | Control Group | |
|----------------|--------------------|--------|---------------|--------|
| | Male | Female | Male | Female |
| Frequency (f) | 11 | 13 | 13 | 11 |
| Percentage (%) | 45.8 | 54.2 | 54.2 | 45.8 |
| Total | 24 | | 24 | |

When the normality results in Table 2 were examined, it was found that the total scores of the pretest, post-test and permanency test of the experimental group showed normal distribution ($p > .05$). However, when the total scores of the pretest, posttest and permanency test of the control group was investigated, normal distribution was not observed ($p < .05$). Therefore, it was decided to use parametric test in the analysis of the data regarding the 2nd and 5th research questions, where both data groups were normally distributed, by referring to the expert opinion. On the contrary, in the analysis of the data concerning the 1st, 3rd, 4th and 6th research questions, where one or both of the groups were not normally distributed, non-parametric tests were decided to be used.

The Findings of the First Research Question

In this section, the answer to the question of “Is there a significant difference between the pretest total scores of the experimental and control groups?” has been sought.

As seen in Table 3, it was found that there was no significant difference between the total scores of the pretest of the experimental and control groups ($U=263.500$; $p > .05$). Therefore, it can be said that the experimental and control groups are equivalent groups and that their level of readiness prior to the application is similar. The mean of the total pre-test scores of the participants in the experimental group was $\bar{X}=14.25$; however, the mean of the total pretest scores of the participants in the experimental group was $\bar{X}=25.52$.

The Findings of the Second Research Question

In this section, the answer to the question of “Is there a significant difference between the pretest and post-test scores of the experimental group?” has been sought.

The Dependent Samples T Test was used to determine whether the use of the mind map technique in the teaching

Table 2. Shapiro-wilk test of the total scores of the pretest of the experimental and control groups on substantive verbs

| | Statistic | df | Sig. | Skewness | Kurtosis |
|--------------|-----------|----|-------|----------|----------|
| Experimental | | | | | |
| Pretest | 0.940 | 24 | 0.166 | 0.229- | -1.216 |
| Post-test | 0.968 | 24 | 0.614 | 0.527- | -0.050 |
| Permanency | 0.968 | 24 | 0.622 | 0.535 | 0.074 |
| Control | | | | | |
| Pretest | 0.803 | 24 | 0.000 | 1.825 | 3.349 |
| Post-test | 0.801 | 24 | 0.000 | 1.601 | 2.082 |
| Permanency | 0.855 | 24 | 0.003 | 1.262 | 0.814 |

Table 3. Mann- whitney U test values regarding the total scores of the experimental and control groups on substantive verbs

| Groups | N | \bar{X} | Mean Rank | Sum of Rank | Z | U | p |
|--------------|----|-----------|-----------|-------------|--------|---------|-------|
| Experimental | 24 | 14.25 | 23.48 | 563.50 | -0.506 | 263.500 | 0.613 |
| Control | 24 | 18.87 | 25.52 | 612.50 | | | |
| Total | 48 | | | | | | |

of the substantive verbs showed a significant difference in the increase in the success of the students of the experimental group. As a result, it was seen that there was a significant difference between the total scores of the pretest and post-test of the experimental group on the substantive verbs ($t=-13.752$; $p < .05$). Based on the findings, it was revealed that the use of mind map technique on the teaching of sub-stantive verbs improved student achievement (Table 4).

The Findings of the Third Research Question

In this section, the answer to the question of “Is there a significant difference between the pretest and post-test scores of the control group?” has been sought.

According to Table 5, when the difference between the pretest and post-test scores were examined in the control group where the substantive verbs were taught by lecturing method, it was found that there was an increase in the success in the control group ($Z= -2.675$; $p < .05$).

The Findings of the Fourth Research Question

In this section, the answer to the question of “Is there a significant difference between the pretest scores of the experimental and control groups?” has been sought.

According to Table 6, it was observed that there was a significant difference between the total scores of the post-test of the experimental and control groups, which were equivalent in the first place, in favour of the experimental group. The mean of the students in the experimental group was $\bar{X}=63.66$; however, the mean of the students in the control group was $\bar{X}=24.45$ ($U= 53.500$; $p < .05$).

The data obtained revealed that the teaching of substantive verbs through the mind map technique was significantly effective compared to the lecturing method, one of traditional teaching methods, in the increase in the success of the subject.

The fact that the group average of the post-test scores of the students in the experimental group was significantly higher than that of the students of the control group indicated that the students trained with mind map technique were more successful in gaining the acquisition of “S/he uses substantive verbs in accordance with their functions” (MEB, 2019, p.46) compared to the control group, indicating that using mind map technique on the teaching of substantive verbs improves success.

The Findings of the Fifth Research Question

In this section, the answer to the question of “Is there a significant difference between the post-test total scores of the experimental and control groups?” has been sought.

Dependent Samples T Test was carried out to determine whether mind map technique had a significant effect on the permanency of the teaching of substantive verbs. After 21 days, following the post-test implementation, the same test was applied to the students again. The scores obtained from this test were used as the scores of the permanency test. As a result of the analysis, no significant difference was found between the scores of the post-test and permanency test ($t=0.624$; $p>.05$). The mean of the post-test scores of the students was $\bar{X}=63.66$; however, that of permanency test was $\bar{X}=63.5$ (Table 7).

The Findings of the Sixth Research Question

In this section, the answer to the question of “Is there a significant difference between the post-test and permanency test scores of the experimental group?” has been sought.

Table 4. Dependent samples T test values regarding the total scores of the pretest and post-test of the experimental group on substantive verbs

| | N | \bar{X} | ss | t | df | p |
|--------------------|----|-----------|----------|---------|----|-------|
| Experimental Group | | | | | | |
| Pretest | 24 | 49.0833 | 8.53764 | -13.752 | 23 | 0.000 |
| Post-test | 24 | 57.5833 | 19.90776 | | | |

Table 5. Wilcoxon test values regarding the total scores of the pretest and post-test of the control group on substantive verbs

| Post-test, Pretest | N | Mean Rank | Sum of Rank | Pretest \bar{X} | Post-test \bar{X} | Z | p |
|--------------------|----|-----------|-------------|-------------------|---------------------|--------|-------|
| Negative Ranks | 7 | 8.07 | 56.50 | | | -2.675 | 0.007 |
| Positive Ranks | 17 | 14.32 | 243.50 | 18.87 | 24.45 | | |
| Ties | 0 | - | - | | | | |
| Total | 24 | | | | | | |

Table 6. Mann- whitney U test values regarding the total scores of the post-test of experimental and control groups on substantive verbs

| Groups | N | \bar{X} | Mean Rank | Sum of Rank | Z | U | p |
|--------------|----|-----------|-----------|-------------|--------|--------|-------|
| Experimental | 24 | 63.66 | 34.27 | 822.50 | -4.840 | 53.500 | 0.000 |
| Control | 24 | 24.45 | 14.73 | 353.50 | | | |
| Total | 48 | | | | | | |

Table 7. Dependent samples T test values regarding the total scores of the post-test and permanency test of the experimental group on substantive verbs

| | N | \bar{X} | ss | t | df | p |
|------------|----|-----------|-------|-------|----|-------|
| Post-test | 24 | 63.66 | 19.91 | 0.624 | 23 | 0.539 |
| Permanency | 24 | 63.50 | 19.73 | | | |

Table 8. Wilcoxon test values regarding the total scores of the post-test and permanency test of the control group on substantive verbs

| Post-test Permanency Test | N | Mean Rank | Sum of Rank | Post-test \bar{X} | Permanency Test \bar{X} | Z | p |
|---------------------------|----|-----------|-------------|---------------------|---------------------------|-------|-------|
| Negative Ranks | 10 | 6.25 | 62.50 | | | -2.63 | 0.009 |
| Positive Ranks | 1 | 3.50 | 3.50 | 24.45 | 22.08 | | |
| Ties | 13 | - | - | | | | |
| Total | 24 | | | | | | |

When the post-test and permanency test scores of the control group were examined, it was seen that there was a significant negative difference between them ($Z=-2.631$; $p<.05$). The mean score of the post-test of the students was $\bar{X}=24.45$; however, the mean score of the permanency test $\bar{X}=22.08$ (Table 8).

When the data were examined, it was found that the use of mind map technique on the teaching of substantive verbs contributed to the permanence of learning compared to the lecturing method.

The mean of the total scores of the pretest, post-test and permanency test of the experimental and control groups on substantive verbs are as presented in Table 9:

DISCUSSION

The use of traditional methods and techniques causes various problems in the teaching of grammar as well as listening, speaking, reading and writing skills (Güneş, 2013). Due to such reasons as limited time allocated for teaching and not requiring comprehensive preliminary work, the lecturing method used in grammar teaching leads students to memorize the information rather than to structure it. The fact that the information that is memorized is forgotten in a short while is insufficient in terms of the permanence of

Table 9. The mean of the total scores of the pretest, post-test and permanency test of the experimental and control groups on substantive verbs

| | Pretest (\bar{X}) | Post-test (\bar{X}) | Permanency Test (\bar{X}) |
|--------------|-----------------------|-------------------------|-------------------------------|
| Experimental | 14.24 | 63.66 | 63.50 |
| Control | 18.87 | 24.45 | 22.08 |

the acquired knowledge and skills. In addition, the lack of student's interest in the course due to the passivity and the negative effect of the attitude towards the course are among the other problems encountered. In addition, students only memorize the rules, preventing grammar from supporting literacy skills.

It has been seen that the above-mentioned problems are eliminated through the methods and techniques developed in accordance with the constructivist approach. In certain method and techniques based on meaningful learning, which enable students to be active rather than being passive learners and where teachers are guides rather than lecturers, it has been revealed that the knowledge and skills acquired is constructed in more meaningful way and the permanence in learning is assured. The mind map technique, which is the subject of the current study, is a technique, with its positive features, based on the constructing of the information.

The substantive verbs subject is related to syntax and semantics. According to Hunutlu (2018), if the subject of the substantive verbs is not understood, there will be difficulties in the subjects of the syntax, semantics and morphology it is related to. This negatively affects the student's literacy skills. Substantive verbs are helpful in seeing the characteristics of the predicate, separating the noun and verb sentence, determining the basic qualities of noun and verb inflexional suffixes.

The results of this study show that when the mind map technique is used, students understand the information much better and associate it with their previous learning. When the groups were compared, the experimental group students more successfully applied what they learned with the mind mapping technique in the answers they wrote. Thus, we can say that using the mind map technique in teaching substantive verbs contributes to writing skills.

In light of the research findings, in the experimental group where the mind map technique regarding the acquisition of "S/he uses substantive verbs in accordance with their functions" (MEB, 2019, p.46) was used, it was found that the learning level was higher compared to the control group. The pretest administered to both groups prior to the application indicated that the mean values of the groups were close to one another and the readiness levels were similar. However, after the application, according to the post-test scores, it was observed that there was a significant difference in favour of the experimental group. This shows that teaching through the mind map technique is more effective compared to the lecturing method in the teaching of substantive verbs.

Comparing the difference between the mean values of the pretest and post-test scores of the experimental group

and the mean values of the pretest and post-test scores of the control group, it was found that the level of learning was significantly higher in the experimental group. The fact that the part- whole relation is effectively established through the mind map technique, the knowledge is meaningfully constructed in the mind and the acquired knowledge is associated with one's past experiences by benefitting from free association during the establishment of the relations of the concepts with one another plays a pivotal role in this increase observed.

In order to examine the effect of the mind map technique on the permanence of learning, a permanency test was applied to both groups 21 days after the post-test application. As a result of the analysis of the research findings, it was found that there was a significant difference in favour of the experimental group. This difference has indicated that the use of mind map technique is more effective in transferring the acquired information to long-term memory compared to the lecturing method.

Previous research in the literature has shown that the mind map technique is also effective on other language skills. The studies carried out by Bukhari (2016), Nurlaila (2013), Tağa (2013) and Uysal (2018) have revealed that the mind map technique is effective on writing skills; the studies by Aslan (2006), İşleyen Buzlu (2019), Ede (2012) and Rizqiya, (2013) have indicated that the use of mind map technique is effective on reading skill and the study conducted by Aydın (2009) has shown that the mind map technique is effective on listening skill.

CONCLUSION

In light of all these data, it has been seen that the mind map technique, which is a teaching technique suitable for the constructivist approach, is an effective method in teaching grammar as well as basic language skills. Thanks to the use of this technique, students are able to construct grammar in their minds in a meaningful way instead of memorization, to explore the relations between concepts and to easily transfer the knowledge and skills that they acquire from short-term memory to long-term memory. Therefore, using the mind map technique in teaching substantive verbs and grammar will contribute positively to the student's literacy skills. The student's increasing grammatical proficiency will enable her to understand what s/he reads in the most accurate way and to express her thoughts more accurately in her writings through the syntactic and semantic features of her language.

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