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The Effect of Understanding Phrase-Meaning Relationship through Digital Storytelling on Academic Achievement and Retention[1]

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Abstract

The purpose of the current study is to reveal the effect of teaching the phrase-meaning relationship through digital storytelling on academic achievement and retention in teaching Turkish grammar. The study employed the mixed method. In the quantitative part of the study, the factorial design, one of the experimental designs, and in its quantitative part, the case study was simultaneously used. The study group of the current research is comprised of 40 8th grade students attending two different classes. As the data collection tools, a personal information form, an academic achievement test and an open-ended question form (OEQF) and a semi-structured interview form administered to the experimental group students were used. In the analysis of the qualitative data, descriptive statistics such as arithmetic means, standard deviations, percentages and frequencies were used. The normality of the data distribution was tested through skewness and kurtosis coefficients and these coefficients were found to be between +1 and -1. Moreover, the z statistic calculated by dividing the skewness coefficient by its own standard deviation was tested. As an additional proof to the normality of the distribution, Shapiro Wilk test was administered; and the equality of the variances was tested with Levene test. In the within and between-groups comparisons of the pre-test and post-test achievement scores of the experimental and control groups and their retention test scores, two-way variance analysis was used. The data collected through the OEQF and interviews conducted with the experimental group students were analyzed by using the content analysis and descriptive analysis techniques. The current study concluded that the instruction given to the experimental group students for them to understand the phrase-meaning relationship by using the digital storytelling more positively affect the secondary school 8th grade students' academic achievement and retention of what they have learned when compared to the current means of instruction given to the control group students.

Key Words: Digital storytelling, phrase-meaning relationship, elements of a sentence, grammar teaching, academic achievement, retention.

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Introduction

Giving importance to functionality in education will enable students to associate what they have learned with life and make them a part of their lives, which will lead to permanent learning as well as improvement in students' academic achievements. The principle of "relating to life", one of the basic principles of Turkish education, draws attention to training for this purpose. Accordingly, it seems to be important to organize the educational activities by taking into consideration the functionality. For this reason, as in all areas of education, it seems to be good to identify a teaching strategy relying on meaningful learning and relating what has been learned to the real life in grammar teaching. Another issue that should be considered is the necessity of organizing educational and instructional activities by using technology as the effect of technology in our lives increases with each day. In today's world, where we live in close interaction with technology, the materials to be used in educational and instructional settings must meet the interests and needs of the students, address their different senses, and develop them in terms of knowledge, skills and intellectual capacities. Given the delineations above, the importance and necessity of grammar teaching centered on meaning and information technologies become evident.

When how the theories of grammar teaching have been implemented in Turkey is examined, it seems to be clear that the behaviorist approach widely used for many years to make students memorize the structures of the language through repetition did not help them develop their language skills. Moreover, this teaching approach has led students to view grammar as a boring set of rules and to develop a negative attitude towards grammar. With the constructivist language approach, more emphasis is placed on the development of mental skills and social skills as well as language skills and it is aimed to create individuals who are thinking, researching, questioning, and having problem solving skills and also using Turkish properly, beautifully and effectively (Güneş, 2013a, 2013b). As in all areas of education, it is very important to determine a teaching strategy based on comprehension in grammar teaching and through which what has been learned can be related to real life. Given that the constructivist approach aims to promote students' linguistic, mental and social skills, students should be enabled to discover the meanings and functions of information learned; thus, to relate it to the real life by conducting suitable in-class and out-of class activities. In this respect, the constructivist language teaching approach is similar to the functional language teaching approach. The use of methods bringing the functional aspect of grammar to the fore will make it possible to achieve positive and permanent outcomes in grammar teaching (İşcan, 2007). While the competence "communicating in the mother tongue", which should be mastered by every individual, is being defined in the 2018 Turkish Curriculum, the need for understanding and using the language is also pointed out (MEB, 2018). In this connection, we can say it that an approach focusing on comprehending and relating what has been learned to the real life can contribute to the effective occurrence of grammar teaching because as grammar provides the basis for the development of language skills, it must be taught

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accurately and effectively. Only considering the form in grammar teaching is not enough for effective teaching to occur. Larsen Freeman (1991, 1997) stresses that in grammar teaching, besides form, meaning and usage should be strongly emphasized; they should be taught in an integrated manner as grammar is a unity of meaningful structures. In other research exploring this issue (Coşkun, 2015; Dalbagno, 2016; Khan, 2007; Kurudayıoğlu, 2014; Larsen Freeman & Anderson, 2013; Nunan, 1998, Şaf, 2010), it has also been argued that grammar teaching centered on meaning and usage as well as form positively affects the learning process.

One of the subjects on which the greatest problems are experienced in grammar teaching is the sentence structure. The main reason behind these problems is teaching the grammar terms corresponding to the elements of a sentence through rote memorization without explaining the meanings of the elements and how they are brought together to create a meaningful unity. However, teaching the grammar subject of sentence structure by focusing on the phrase-meaning relationship will arouse students' interest in the course and allow them to relate what they have learned to the real life. The existing research has revealed that creation of meaning-phrase relationships contribute to the development of students' language skills (Işık, 2012), help them conduct an in-depth analysis of the sentence and determine the meaningful units more accurately (Coşkun, Uysal, & Özkaya, 2017), enable students to explore the deep structure, to establish language-thought-imagination relationship and to uncover the richness of the language (Coşkun, Özkaya, & Uysal, 2017; Özkaya & Coşkun, 2017). Moreover, Polat (2014) emphasized that as in prose writing, in the analysis of the sentences constituting a poem, it is of great importance to create connections between the meaning and structure. In grammar classes directed to teaching sentence structure, focusing only on terms such as subject, verb, object, adverbial clause, indirect object is inadequate in terms of inculcation of linguistic awareness in individuals because language is made up of meaningful units. Individuals who can recognize units carrying primary or secondary meaning can easily detect the subject, object, time, place, means (Coşkun, 2015). The whole of the meaningful elements located in the foundation of a sentence constitutes the deep structure (Hengirmen, 2007). Analysis of the linguistics units in terms of meaning makes it possible to discover the relationships not seen on the surface but found in the deep structure (Üstünova, 2010).

Sentence analysis progressing from meaning to term refers to the exploration of which meaning the elements of a sentence have and from which aspect they complement the sentence and then to the discovery of grammar terms corresponding to these meaningful units. Depending on the meaning they have in a sentence, concepts such as "time, cause, manner, direction, togetherness, means, amount, purpose" correspond to the term "adverbial clause". The meanings expressed by the terms "subject" and "object" in a sentence are "the one affecting" and "the one being affected". The concepts "being directed to, being present and leaving" correspond to the term "indirect object". If the concepts of "being directed to, being present and leaving" are related to place, they can be called

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"place" (to cinema, in the wardrobe, from İstanbul, etc.). As the other elements in a sentence are determined by relating them to the verb, the main element "verb" to which other elements are connected is called "heart" on the basis of the meaning it holds (Coşkun, Özkaya ve Uysal, 2017; Coşkun, Uysal ve Özkaya, 2017; Özkaya ve Coşkun, 2017). Progression from meaning to term in sentence analysis makes it possible to comprehend the meanings of the elements making up the sentence as well as to learn the names of the terms corresponding to the elements. A sentence analysis progressing from meaning to term can be exemplified as follows:

Last night / my mother / broke / the vase in the living room.			
Time adverbial (the time when the action is done)	*the one affecting*	*heart*	*the one being affected*
	Subject	*verb*	*object*
	(doer, the one that does the action)	(the verb indicating action done)	(The one being affected from the action of the subject)

As can be seen in the sample sentence given above, students are first made to discover from which aspects of meaning the elements in a sentence complement the sentence and then the grammar term corresponding to the meaningful unit is determined. Through such an approach, while the meaning is brought to the fore to establish and develop language skills, at the same time, students can be trained to answer questions requiring them to find the names of terms in exams. Teaching the subject of sentence structure through progression from meaning to form will enable students to grasp language skills and to establish meaning-term relationship (Özkaya & Coşkun, 2017).

In language classes built on the phrase-meaning relationship, it is important to enrich the instructional environment by using methods and techniques promoting students' in-class interactions and developing their thinking skills. Presentation of the topic through stories from the real life helps students to relate the topic to their own lives. Digital storytelling allows the presentation of a story in a context in such a way as to appeal to different senses, which makes it suitable for the mastery of the phrase-meaning relationship. There are many definitions made for digital storytelling allowing the integration of stories with digital technologies and the presentation of a story in such a way as to cater to different senses. The common aspects of these definitions are that digital storytelling is performed in an interactive digital environment through the presentation of texts, sounds, images and music in the form of short videos (Figa, 2004; Meadows, 2003; Miller, 2004; Ohler, 2006; Tatum, 2009).

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Involvement of different senses in the process of learning enhances retention. While establishing the phrase-meaning relationship, students' awareness of the life is also raised as they can see the roles and effects of the meanings possessed by the elements in the real life. In this way, students can detect the elements that make their lives meaningful by observing their surroundings. This fosters students' thinking, questioning and relating skills as well as their observation skills. The use of digital storytelling in education positively affects students' academic achievement and attitudes towards the course (Demirer, 2013; Göçen, 2014; Nam, 2017; Sever, 2014; Yang & Wu, 2012). Yang and Wu (2012) found that digital storytelling method develops students' critical thinking skills. When the relevant literature is reviewed, it is seen that digital storytelling not only enhances students' language skills (Baki, 2015; Balaman Uçar, 2016; Ciğerci, 2015; Çıralı, 2014; Kulla Abbott, 2006; Özer, 2016; Tabak, 2017; Yamaç, 2015), it is also very effective in different disciplines such as physics education (Kahraman, 2013), science education (Torun, 2016; Ulum, 2017), social studies education (Demirer, 2013), fine arts education (Ayvaz Tunç, 2016), values education (Yürük, 2015), pre-school education (Başdaş, 2017; Gözen & Cırık, 2017), adult education (Prins, 2017) and in different populations such as teachers (Gordon, 2011; Karakoyun, 2014), pre-service teachers (Gakhar, 2007; Göçen, 2014; Göçen Kabaran & Aldan Karademir, 2017; Shelton, Archambault, & Hale, 2017; Yavuz Konokman, 2015). However, in the relevant literature, there is no research investigating the effect of digital storytelling on grammar teaching providing the basis for the development of language skills.

When the existing research on grammar teaching has been reviewed, it is seen that meaning-centered instruction and making use of information technologies have led to positive effects on the development of grammar. The limited amount of research focusing on meaning in grammar teaching (Coşkun, Uysal, & Özkaya, 2017; Coşkun, Özkaya, & Uysal, 2017; Işık, 2012; Özkaya & Coşkun, 2017; Polat, 2014; Şaf, 2010; Uysal & Bardakçı, 2014) has pointed out that for permanent learning to occur, students need to internalize what they have learned by relating them to the real life and this is only possible through an approach primarily focusing on meaning and that such an approach can generate positive impacts on the development of students' thinking and language skills. Moreover, in the existing research, making use of information technologies and visual tools in grammar teaching has been found to be to positively affecting students' achievement and attitudes and activation of more than one sense has been found to be leading to increasing retention (Abu Naba'h, 2012; Akbaba, 2007; Akkaya, 2011; Durukan, 2011; Özkoyuncu, 2016; Saeedi & Biri, 2016; Yağcı, 2002).

However, in the relevant literature, no study addressing both meaning and information technologies together has been encountered. The current study seems to be original as it investigates information technologies and meaning in tandem by means of digital storytelling. As it is a two-dimensional study integrating meaning with technology, the current study is believed to make some contributions to the literature.

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The purpose of the current study is to elicit the effect of making students understand the phrase-meaning relationship by means of digital storytelling on academic achievement and retention in Turkish grammar teaching.

Within the framework of this general purpose, answers to the following questions were sought:

1. Is there a significant difference between the use of digital storytelling and the current method in the teaching of the phrase-meaning relationship to the middle school eight grade students within the context of teaching sentence structure in the learning area of grammar of Turkish language course in terms of achievement level and retention?

2. What are the misconceptions held by the middle school eight grade students instructed by means of digital storytelling about the phrase-meaning relationship and those of the students instructed by means of the current method?

3. What are the students' opinions about the instruction given through digital storytelling for teaching them the phrase-meaning relationship?

Method

Research Model

In the current study, the mixed method was employed. The mixed method is a research method in which quantitative and qualitative data are collected and analyzed together (Creswell, 2011; Johnson & Onwuegbuzie, 2004; Punch, 2014; Teddlie & Tashakkori, 2015). When the current research is evaluated in terms of the issues important in the determination of which mixed method design to use, in the group of mixed designs in which the quantitative and qualitative data are simultaneously processed, greater priority is assigned to the qualitative data and the quantitative data are embedded into the qualitative design. In the relevant literature, there are many design classifications (Greene & Caracelli, 1997; Johnson & Onwuegbuzie, 2004; Leech & Onwuegbuzie, 2009; Morse, 1991; Teddlie & Tashakkori, 2015). For the design of the current study, the embedded mixed design from the classification by Creswell and Plano Clark (2015) was found to be suitable. This design called the embedded design is used in situations in which a single data set is not adequate; different research questions require different data sets (Creswell & Plano Clark, 2015) and generally for the purpose of supporting the experimental and relational quantitative research with qualitative data (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2014). In the qualitative dimension of the study "the factorial design", one of the experimental designs and in the quantitative dimension, "the case study", were simultaneously used.

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The factorial design used in the quantitative dimension is a type of design allowing the simultaneous investigation of the effect of two or more independent variables (factors) on the dependent variable separately and in combination (Balcı, 2004; Büyüköztürk et al., 2014; Christensen, Johnson, & Turner, 2015; Fraenkel & Wallen, 2008). Factorial designs can be classified as between-groups, within-groups and mixed designs (Büyüköztürk et al., 2014). For the current study, from among these factorial designs, the mixed design was selected. In the mixed design, there are at least two independent variables whose effect on the dependent variable is examined. One of them defines different experimental operations and the other defines repeated measurements made at different times (Büyüköztürk et al., 2014; Christensen et al., 2015). In the design used in the quantitative part of the study, students' academic achievement is taken as the dependent variable. The digital storytelling-based instruction applied to the experimental group to teach them the phrase-meaning relationship, the current instruction applied to the control group and the pre-test, post-test and retention test administered at different times are taken as the independent variables of the current study.

The case study design making up the qualitative part of the study is a qualitative approach in which the researcher describes a case or cases by collecting detailed information about a case or cases from multiple data sources such as observations, interviews, documents (Creswell, 2015; Merriam, 2013; Seggie & Bayyurt, 2015). Within the context of the current study, the misconceptions of the experimental and control group students about the subject of the study and the experimental group students' opinions about the effect of the implementation process were examined and these cases were described.

Study Group

The study group of the current research is comprised of the middle school 40 eight graders attending two different classes in a middle school in the city of Mugla within the fall term of 2016-2017 school year. The reason for the selection of eight graders for the current study is that the subject of sentence structure is in the grammar learning area of the Turkish Language course curriculum of eight graders. Students were randomly assigned to the experimental and control groups. Of the participating students, 52.5% (n= 21) are girls and 47.5% (n= 19) are boys.

In the current study, the match between the experimental group and the control group was ensured with the pre-test scores they took from the academic achievement test. In the experimental group, there are 21 (9 girls and 12 boys) and in the control group there are 19 (12 girls and 7 boys) students.

Data Collection Tools

Academic Achievement Test: An academic achievement test was developed by the researcher to measure the participating students' achievement in the subject of sentence structure.

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While developing the test, first the Turkish language course curriculum was examined, and the learning outcomes set in relation to the subject located in the grammar learning area were determined. The table of indicators in relation to distribution and content of the subject was formed and in the selection of the questions, the questions asked in the centralized exams of former years and various question banks were utilized. In this way, a total of 35 questions were selected and submitted to the review of three field experts and an educational sciences expert. In line with the feedbacks taken from the experts, some changes were made on the wording of some questions and thus the final form of the achievement test was given. The test was piloted on 50 eight grade students attending middle schools in the city of Muğla in 2015-2016 school year. As a result of this implementation, the KR-20 reliability coefficient of the 35-item test was calculated to be .80. After the piloting, item analyses and test analyses were conducted on the test items. Seven questions were discarded from the test whose item discrimination values were found to be lower than (Rjx) .25 as a result of the calculation of item discrimination index and item difficulty and thus, a final 28-item achievement test was obtained. As a result of the analysis, the KR-20 reliability coefficient of the 28-item test was found to be .83.

The obtained twenty-eight questions substances in academic achievement test subject and measuring the value ranges are shown in Table 1.

Table 1. The Range of Values of the Academic Achievement Test Items and the Subjects Measured by Twenty-Eight Questions

Question	Subject	Difficulty Value	Mean discrimination value	Question	Subject	Difficulty value	Mean discrimination value
1	Subject	.86	.26	**15**	Divide a sentence into its elements	.62	.52
2	Adverbial clause	.74	.43	**16**	Verb	.38	.47
3	Sequence of elements	.60	.45	**17**	Subject	.68	.50
4	The element emphasized in a sentence	.84	.35	**18**	Sequence of elements	.70	.47
5	Object-Indirect object-Adverbial clause	.82	.24	**19**	Verb	.56	.27
6	Sequence of elements	.50	.37	**20**	Object	.70	.39
7	Indirect object	.70	.40	**21**	The element emphasized in a sentence	.68	.37
8	Subject	.28	.28	**22**	Divide a sentence into its elements	.54	.50
9	Indirect	.74	.50	**23**	Adverbial	.76	.42

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	object				clause		
10	Subject	.72	.35	**24**	Indirect object	.78	.40
11	The element emphasized in a sentence	.76	.36	**25**	Verb	.54	.43
12	Divide a sentence into its elements	.62	.53	**26**	Object	.48	.52
13	Object	.46	.32	**27**	Divide a sentence into its elements	.62	.43
14	Verb	.78	.39	**28**	Sequence of elements	.70	.51

According to the data in Table 1, the mean item difficulty value (Pj) of the academic achievement test was found to be .64; mean discrimination value (Rjx) was found to be .40. These values show that the academic achievement test is applicable.

Open Ended Question Form: In order to detect the students' misconceptions on the sentence structure and to support the findings obtained from the academic achievement test, an open-ended question form (OEQF) was developed by the researcher. In order to establish the content validity of OEQF, the learning outcomes of the subject of sentence structure in the Turkish Language course curriculum and the explanations made for these learning outcomes were taken into consideration. The questions in OEQF, were prepared in accordance with the stages "understand", "apply" and "analyze" in Bloom's new taxonomy. In this way, while the students' misconceptions about the subject of sentence structure were being determined, they were enabled to use their higher order thinking skills. Three more questions were added to the open-ended question form initially including four questions as a result of the review made by two field experts and one educational sciences expert; thus, the number of the questions in the form increased to seven. The first and second questions in OEQF aim to elicit whether the students can recognize the element emphasized in a sentence. As such, the students were asked to underline the auxiliary element stressed in the first question and to underline the basic element stressed in the second question and to write their names. The aim of the third question is to elicit whether the students have understood the basic elements of a sentence; the aim of the fourth question is to elicit whether they have understood the auxiliary elements of a sentence. To this end, the students were asked to select one of the words given to them and to use it as a subject of a sentence they would create within the context of the third question and as an object of sentence they would create within the context of the fourth question. The aim of the fifth question is to determine whether the students can divide a sentence into its elements accurately. To this end, the students were given two sentences and asked to separate them into their elements. The aim of the sixth and seventh questions is to determine whether the students can generate sentences in compliance with the given sequence of elements. For this purpose, the students were asked in the sixth

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question to create a sentence in which the elements are sequenced as "subject-indirect object-object-verb" and they were asked in the seventh question to generate a sentence in which the elements are sequenced as follows "subject-object-adverbial clause-verb".

Student Interview Form: A semi-structured interview form was developed by the researcher to elicit the experimental group students' opinions about the use of the digital storytelling method in the Turkish language course and about the formation of the phrase-meaning relationship. There were six questions in the initial interview form and then on the basis of the feedbacks received from two field experts and two educational sciences experts, three more questions were added, thus the total number of the questions became nine. The questions 1, 2, 5, 6 and 7 aim to elicit the students' opinions about the digital storytelling method. In this connection, the first question was asked to the students to determine how they felt about the method; the second question was asked to elicit their opinions about the effect of the method on achievement; the fifth question was asked to elicit their opinions about whether the method should be preferred to teach grammar subjects; the sixth question was asked to elicit their opinions about whether the method should be preferred to teach Turkish classes and the seventh question was asked to elicit their opinions about whether the method should be preferred to teach different courses. The questions 3, 4 and 8 aim to elicit the students' opinions about learning the subject of sentence structure by bringing meaning to the fore; that is, through the phrase-meaning relationship. In this regard, the third question was asked to determine the effect of bringing meaning to the fore on learning; the fourth question was asked to determine whether what has been learned is related to the real life and the eighth question was asked to determine the difficulties experienced during learning. The ninth question was asked to determine the students' suggestions for different activities to be used during the instruction apart from the ones having already been implemented.

Implementation Process

At the beginning of the study, Muğla Sıtkı Koçman University Ethics Committee Approval was obtained with regard to the implementation process and the data collection tools to be used. Prior to the implementation, the data collection tools developed in the current study were administered to the study group within the fall term of 2016-2017 school year to determine the current state of the students as pre-tests. In the determination of the experimental and control groups, the students' pre-test scores taken from the academic achievement test were taken into consideration and as a result of the independent samples t-test, no significant difference was found between the mean achievement scores of the groups ($t(38)= .17$; $p> .05$). The activities and instructions were carried out by the researcher within a four-week period in which according to the curriculum the subject of sentence structure would be taught in the classroom by the teacher. Two class hours each week and thus a total of eight class hours were allocated to the implementation. The reason for conducting the implementation in

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this time period is that in the curriculum, this is the period of time allocated to the teaching of the subject of sentence structure. In the control group, the lessons were delivered according to the current curriculum and the instructions given in the teacher's book and the activities in the student's book and in the Education Information Network. As there is no activity in the workbook for general revision, in the fourth week in which the general revision is expected to be done, a group writing activity was performed. There is no difference between the lessons taught in the experimental and control groups in terms of the subject and learning outcomes. The only difference between the two groups is that the activities conducted in the experimental group were directed to teaching of the phrase-meaning relationship by means of digital storytelling which brought meaning to the fore. In the experimental group, the activities were structured on the basis of establishing the phrase-meaning relationship by using cards matching, group writing, acting out and station activities which were designed to reinforce the learning outcomes addressed in the digital stories, to enhance students' in-class interactions and to promote their thinking skills. The activities were sequenced in line with the themes of the digital stories that would be presented in the four-week period. In this way, connections were established between the stories the students watched and the activities they were engaged in, thus, consistency was ensured. After the completion of the implementation, the measurement tools developed in the current study were administered to determine the improvements in the achievement levels of the experimental and control group students as post-tests. Student interviews were conducted following the administration of post-tests with all the experimental group students in the teacher's room. The students were individually interviewed; the questions in the semi-structured interview form developed by the researcher were directed to the students. The students' consents were gained and then the interviews lasting ten minutes on average were tape-recorded. The data that were tape-recorded were coded according to the students' names and entered into computer environment. Four weeks after the completion of the implementation, the measurement tools developed in the current study were administered to the experimental and control group students once more to determine the retention.

Data Analysis

Quantitative Data Analysis: In the analysis of the quantitative data, descriptive statistics such as arithmetic means, standard deviations, percentages and frequencies were used. In the determination of the experimental and control group students, their pre-test achievement test scores were taken into consideration. From parametric tests, the independent samples t-test was used to determine whether there is a significant difference between achievement pre-test mean scores of the groups. Two-way variance analysis (two-way ANOVA for mixed measurements) for between-groups and within-groups comparisons of the academic achievement pre-test, post-test and retention test was used. Prior to the analysis of the data, the assumptions of the two-way ANOVA test were tested. In this regard, first outlier analysis was conducted. In the determination of the outliers, z values ($z < 3$) were calculated. The z values for the academic achievement pre-test were found to be ranging from

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1.61 to 2.40; for the academic achievement post-test they were found to be ranging from 1.55 to 1.75 and for the retention test they were found to be ranging from 1.70 from 1.86. The normality of the distribution was tested with skewness and Kurtosis coefficients and these coefficients were found to be between +1 and -1. Moreover, then the z statistic obtained by dividing the skewness coefficient into its own standard error was checked. This value was found to be 1.96 in 95% confidence level, indicating that the distribution is not overtly skewed from the normal distribution (Büyüköztürk, 2016). This value was found to be .52 as the lowest and 1.68 as the highest for the achievement test. Thus, the distribution was accepted to be normal. Moreover, as the additional evidence to the normality of the distribution, Shapiro Wilk test was administered as the sampling size is smaller than 50 (Büyüköztürk, 2016) (pre-test: P experimental= .10, P control= .38, post-test: P experimental = .39, P control = .04, retention test : P experimental= .10, P control = .01 p> .05); it was found that the pre-test, post-test and retention test data of the experimental group were normally distributed while the post-test and retention test data of the control group were not normally distributed. However, when all the methods used to decide on the suitability of the achievement test scores for the normal distribution and the number of the students making up the study group are taken into consideration, the distribution can be considered to be normal. Homogeneity of the variances was tested with the Levene test and the variances were found to be equal for all the variables. Furthermore, how much of the total variance of the dependent variable is explained by the independent variable was tested with the effect size. When the partial eta-squared ($\eta 2$) is in the range $.01 \leq \eta p2 < .06$, it shows a small effect size, in the range $.06 \leq \eta p2 < .14$, it shows medium effect size and in the range $\eta p2 \leq .14$, it shows high effect size (Green & Salkind, 2005). The eta-squared values showing the effect size within the current study were analyzed considering these ranges.

Qualitative Data Analysis: The qualitative data of the current study were entered into NVivo 10 program package and analyzed through the content analysis and descriptive analysis techniques. The content analysis technique allows the systematization of the codes obtained through the detailed analysis of the data by converting them into categories and themes (Seggie & Bayyurt, 2015). The descriptive analysis on the other hand allows the presentation of the organized and interpreted data with the support of direct excerpts (Karataş, 2015). Within the context of the current study, the descriptive analysis was conducted by including direct excerpts and then the content analysis was carried out to perform an in-depth investigation of the data presented with the support of direct excerpts, to combine codes, to form themes and categories and to describe the relationships between them. While conducting the content analysis, the inductive method was adopted; the data were coded through an in-depth analysis and then categories and themes were formed by combining the codes. In this way, a categorical analysis was employed in the current study and at the same time, the data were subjected to a frequency analysis based on their frequencies. In the analysis of the data obtained from OEQF, a grading key was constructed showing the correct responses to the questions

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asked to the students and how many points should be assigned to each correct unit. According to this key, each of the correct response is to be given one point. The students' responses were assessed on the basis of this key and the total numbers of correct responses of the experimental and control group students to the pre-test, post-test and retention test were determined and interpretations were made on the basis of the correct responses. The main goal of OEQF was to determine the students' misconceptions through the content analysis on the basis of their correct responses and to find their reasons. In the current study, first a table that makes it possible to see the general numbers of the correct answers given by the groups as a whole was constructed. Then, a content analysis was conducted on the students' false answers to determine the reasons behind their misconceptions regarding the subject of sentence structure. From the students' responses to OEQF, pre-test, post-test and retention test, their misconceptions were coded and categorized; both between-groups and within-groups comparisons were made for the obtained findings. The data collected from the semi-structured interviews conducted with the experimental group students were first grouped under the related unit of analysis (question). Then, these codes were combined under certain categories. The units of analysis (questions) for which codes and categories were determined were related to each other according to their contexts; thus, the themes representing the students' opinions were attained. In this way, the coding key including the students' opinions was developed. The codes derived from both OEQF and student interviews were analyzed in relation to their frequencies. In order to establish the reliability of the study, the grading and coding keys and 20% of the data collected from OEQF and student interviews were submitted to review of two field experts. The researcher and the experts' using a same code for the students' statements was considered to be agreement and their using a different code was considered to be disagreement. Thus, the reliability of the analyses conducted was calculated by using the formula [Agreement/(Agreement+Disagrement)x100] (Miles & Huberman, 1994). As a result of this analysis, the current study found that there is no disagreement related to coding and grading keys between the researcher and the experts. The agreement (reliability) was found to be 98.00% and 95.80 between the researcher and the two experts for the data derived from OEQF and student interviews, respectively. The level of agreement for both of the measurement tools was found to be higher than 80%, showing that the coding is reliable (Miles & Huberman, 1994). In the presentation of the qualitative data, the experimental group students were coded as D1, D2, D3…, D21 and the control group students were coded as K1, K2, K3.., K19, and students' statements are directly quoted.

Findings

Findings Obtained from the Academic Achievement Test

Within the context of the current study, it was aimed to determine whether there is a significant difference between the use of digital storytelling and the current method to teach the phrase-meaning relationship within the context of the subject of sentence structure to the middle

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school eight grade students in the learning area of grammar of Turkish language course in terms of achievement level and retention. To this end, the achievement test was administered to the students as pre-test, post-test and retention test. The achievement pre-test, post-test and retention mean scores and standard deviations of these scores taken by the experimental and control group students from the achievement test are given in Table 2.

Table 2. The Experimental and Control Group Students' Mean Scores and Standard Deviations of these Scores Taken from the Achievement Pre-test, Post-test and Retention Test

		Pre-test		Post-test		Retention test	
Group	N	$\overline{X}$	S	$\overline{X}$	S	$\overline{X}$	S
Experimental	21	42.52	20.18	60.66	23.01	61.38	20.90
Control	19	41.47	18.74	55.31	25.31	48.63	27.27

As can be seen in Table 2, while the experimental group students' academic achievement pre-test mean score was found to be 42.25, this mean score increased to 60.66 in the post-test and 61.38 in the retention test. While the control group students' academic achievement pre-test mean score was found to be 41.47, this score increased to 55.31 in the post-test and then decreased to 48.63 in the retention test. Thus, it can be said that the experimental group students' achievement scores increased more in both the pre-test and retention test when compared to the control group.

The results of the two-way ANOVA conducted to determine whether the changes observed in the control and experimental group students' academic achievement pre-test, post-test and retention test mean scores are significant are presented in Table 3.

Table 3. ANOVA Results for the Experimental and Control Group Students' Academic Achievement Pre-test, Post-test and Retention Test Scores

Source of the Variance	Sum of Squares	sd	Mean Squares	F	p	ηp2
Between-Groups	3298.20	39				
Group (D/K)	682.65	1	682.65	9.91	.003	.207
Error	2615.54	38	68.83			
Within-groups	10881.91	66.28				
Measurement (Pre-test-Post-test-Retention)	5770.40	1.60	3475.90	49.69	.000	.567
Group Measurement	698.60	1.60	420.81	6.01	.006	.137
Error	4412.86	63.08	69.95			
Total	14180.11					

*(p< .05)

As can be seen in Table 3, the experimental and control group students' academic achievement test mean scores varied significantly from pre-test to retention test; that is, the common effect of the factors of being in different treatment groups and of repeated measurements on the students' academic achievement was found to be significant (F= 6.01; p< .05). This finding shows that

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different instructions given to the experimental and control group students yielded different effects on increasing the students' academic achievement. The effect size is medium (ηp2= .13). Thus, it can be contended that the instruction given to the experimental group students is more effective than the instruction given to the control group students in terms of improving their academic achievement.

Moreover, as can be seen in Table 3, a significant increase occurred in the experimental and control group students' academic achievement pre-test, post-test and retention test scores (F= 49.69; p< .05). This finding shows that there is a statistically significant difference between the experimental group students' pre-test mean score ($\overline{X}$ = 42.52), post-test mean score ($\overline{X}$ = 60.66) and retention mean score ($\overline{X}$ = 61.38). There is also a statistically significant difference between the control group students' pre-test mean score ($\overline{X}$ = 41.47), post-test mean score ($\overline{X}$ = 55.31) and retention test mean score ($\overline{X}$ = 48.63). Thus, we can say that the instructions given to the both groups were effective in improving the students' academic achievement. Here, there is a strong effect for both of the groups (ηp2= .56). However, when the significant difference between the means of the total scores obtained from the experimental and control group students' achievement scores is examined (F= 9.91; p< .05), it is seen that this difference is in favor of the experimental group. The effect size of the between-groups difference is strong (ηp2= .20).

The increases in the experimental and control group students' academic achievement pre-test, post-test and retention test scores can be clearly seen in Figure 1:

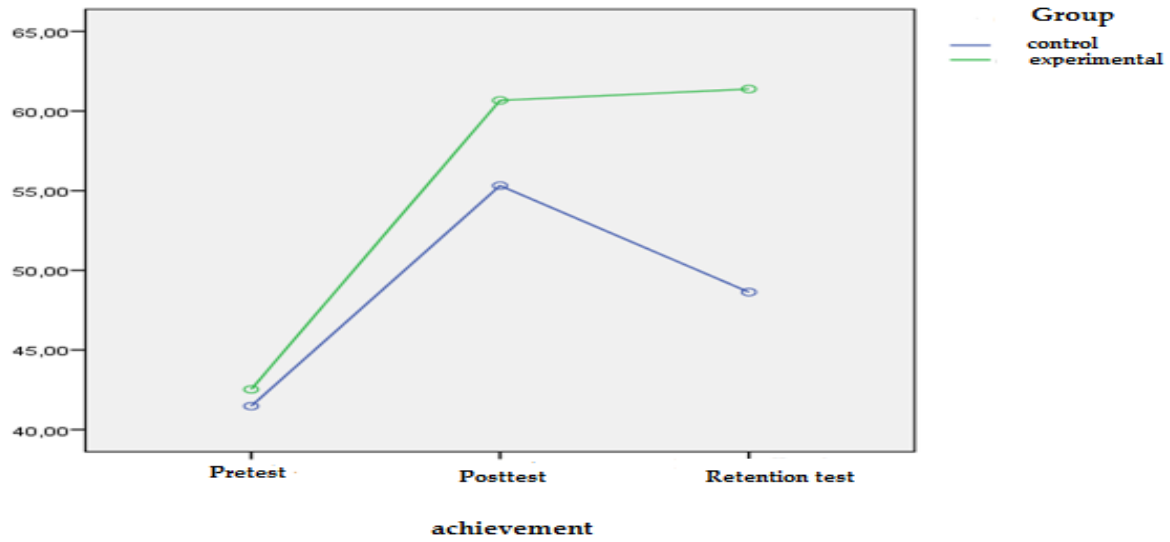

Figure 1. Increases in the Experimental and Control Group Students' Achievement Pre-test, Post-test and Retention Test Scores

As can be seen in Figure 1, the experimental group students' pre-test mean score was found to be 42.52 and the control group students' mean score was found to be 41.47. The post-test mean score of the experimental group students taught the phrase-meaning relationship with digital

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storytelling was found to be 60.66 while that of the control group students taught with the current method was found to be 55.31. Thus, the amount of increase in the experimental group students' mean achievement score was found to be 18.14 points, while the amount of increase in the control group students' mean achievement score was found to be 13.84. This shows that the amount of increase observed in the experimental group is higher than that observed in the control group. When the mean scores obtained from the retention test administered four weeks after the implementation were examined, the mean retention score was found to be 61.38 for the experimental group and 48.63 for the control group. This shows that the experimental group students' retention mean score increased by .72 more than their post-test mean score. The scores of the experimental group students consistently increased. This shows that the instruction delivered to the experimental group students through digital storytelling to teach the phrase-meaning relationship results in a long-term positive influence on the students' achievement. The retention test mean score of the control group however dropped by 6.68 points to 48.63 when compared to the post-test mean score. This may show that the current instruction delivered to the control group students to teach the phrase-meaning relationship loses its effect over time. When all the process is taken into consideration, the amount of increase in the mean score of the experimental group students in the period extending from pre-test to retention test is 18.86 points. In the control group on the other hand the amount of increase is 7.16 points. This shows that the instruction given through digital storytelling to teach the phrase-meaning relationship results in a more positive effect on student achievement when compared to the current instruction applied to the control group.

Findings Obtained from the Open-Ended Question Form

In order to determine whether there is a significant difference between the use of digital storytelling and the current method in the teaching of the phrase-meaning relationship to the middle school eight grade students within the context of teaching sentence structure in the learning area of grammar of Turkish language course in terms of achievement level and retention, OEQF consisting of seven questions were administered to the students as pre-test, post-test and retention test. The data obtained from OEQF were analyzed for each individual question and then the codes including the students' misconceptions were constructed. Then a general evaluation was made to compare the misconceptions of the control and experimental group students found in the pre-test, post-test and retention test. The codes created in relation to the misconceptions on the basis of the experimental and control group students' responses to OEQF are presented in Table 4.

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Table 4. Codes for the Misconceptions Derived from the Experimental and Control Group Students' Responses to OEQF Pre-test, Post-test and Retention Test

Codes Derived from the Responses to the 1st and 2nd Questions	fd	fk	Codes Derived from the Responses to the 3rd and 4th Questions	fd	fk	Codes Derived from the Responses to the 5th	fd	fk	Codes Derived from the Responses to the 6th and 7th Questions	fd	fk
Underlining the correct element but naming it wrongly	3	7	Using the selected element as a different element	34	22	Taking different elements into the same category and naming them wrongly	26	39	Using the wrong element	32	33
Wrongly indicating the stressed element without underlining any of the elements	3	0				Taking different elements into the same category and not being able to name	0	1	Accepting a single element as more than one element	8	10
Underlining the correct element but not being able to name it	0	2				Wrongly disintegrating into the elements and wrongly naming them	11	18	Not being able to construct a sentence in the correct order	16	6
Underlining the wrong element	10	2				Wrongly disintegrating into the elements and not being able to name them	0	1			
Underlining the wrong element and wrongly naming	3	3				Naming wrongly	22	11			
Underlining the wrong element and not naming	5	4				Not being able to name	5	0			
Taking different elements into the same category and naming wrongly	7	5				Not being able to determine any element correctly	9	3			
Taking different elements into the same category and	5	2									

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not being able to name them								
Being able to disintegrate into its elements but not being able to indicate the stressed element	7	12						
Wrongly disintegrating into elements and not indicating the stressed element	4	16						
Total	47	53	34	22	73	73	56	49

In Table 4, the definitions of the codes assigned to the misconceptions determined through the students' responses given to OEQF are presented. The coding of the misconceptions determined for each question can be exemplified on a code for each question as follows: In the 1st and 2nd questions aiming to determine whether the stressed element in the sentence has been understood, the students coded as K9, K18, D17, D21 underlined the correct element as the stressed element in the sentence yet named the element wrongly and in this connection the code "underlining the correct element but naming the element wrongly" was obtained. In the 3rd and 4th questions aiming to determine whether the main and auxiliary elements of the sentence have been understood, the students asked to select one of the words given to them and to make a sentence in which the word is used as the subject "3rd question) and the object (4th question). In the 3rd question, the students coded as K1, K13, D2, D4 used the word they selected as the object instead of the subject and in the 4th question, the students coded as K7, K9, D2, D7 used the word they selected as the subject instead of the object, the code "using the selected word as a different element" was obtained. In the 5th question aiming to determine whether the students can disintegrate the sentence into its elements correctly, the students coded as K2, K4, D1, D5 underlined more than one element thinking that they are the same elements and thus named them wrongly and, in this regard, the code "taking different elements into the same category and naming them wrongly" was obtained. In the 6th and 7th questions aiming to determine whether the students can make sentences according to the sequence of the elements given, the students coded as K5, K11, D7, D10 used an element not present in the given sequence of the elements and thus the code "using the wrong element" was obtained.

As can be seen in Table 4, the total frequencies of the misconceptions derived from the experimental and control group students' responses to the pre-test, post-test and retention test are close

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to each other. However, the reason behind this closeness is that the frequencies of the experimental and control group students' not responding are different. While the number of no response by the experimental group students in the 1st and 2nd questions aiming to determine whether the stressed element in the sentence has been understood in only 1, it is 4 in the control group. While the number of no response by the experimental group students in the 3rd and 4th questions aiming to determine whether the main and auxiliary elements have been understood is 3, it is 10 in the control group. While the number of no response by the experimental group students in the 5th question aiming to determine whether the students can disintegrate the sentence into its elements is 78, it is 135 in the control group. While the number of no response by the experimental group students in the 6th and 7th questions aiming to determine whether they can make sentences complying with the given sequence of the elements is 32, it is 65 in the control group. Given the number of no response, it is clear that the control group students' rate of response to the questions in OEQF is lower than that of the experimental group students. As no response cannot be considered a misconception, we can say that though the number of the questions responded by the control group students is lower than that of the experimental group students, they seem to have equal numbers of misconceptions, and thus, it seems that the experimental group students have fewer misconceptions than the control group students.

The experimental and control group students' numbers of correct answers to the OEQF pre-test, post-test and retention test are shown in Table 5.

Table 5. The Experimental and Control Group Students' Numbers of Correct Answers to the OEQF Pre-test, Post-test and Retention Test

	1st question		**2nd question**		**3rd question**		**4th question**		**5th question**		**6th question**		**7th question**		**Total**	
	C (f)	**F (f)**	**C (f)**	**F (f)**	**C (f)**	**F (f)**	**C (f)**	**F (f)**	**C (f)**	**F (f)**	**C (f)**	**F (f)**	**C (f)**	**F (f)**	**C (f)**	**F (f)**
Pre-test																
Ex	7	14	10	11	10	11	14	7	59	109	48	36	47	37	195	225
Con	3	16	4	15	15	4	8	11	42	110	51	25	34	42	157	223
Post-test																
Ex	13	8	13	8	17	4	17	4	118	50	67	17	68	16	313	107
Con	9	10	14	5	14	5	14	5	81	71	58	18	54	22	244	136
Retention test																
Ex	18	3	16	5	18	3	13	8	113	55	71	13	64	20	313	107
Con	11	8	11	8	16	3	15	4	62	90	60	16	59	17	234	146

In Table 5, the experimental and control group students' total numbers of correct and false answers are given for individual questions and in total. In the pre-test, the experimental group students' absolute rate of success was found to be .46 while that of the control group students was found to be .41. From these values, it is seen the absolute rate of success for both of the groups is around .40. When the data obtained from the OEQF pre-test were examined, we found that the number of correct answers to the 1st and 2nd questions, which is in the stage of understand, is smaller than the number of correct answers given to the 3rd and 4th questions related to determination of the elements and 6th and 7th questions related to sentence order, which are at the stage of apply. This might be

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because of the students' lack of information about the third learning outcome of the subject of sentence order; that is, determination of the stressed element in a sentence, In the 3rd and 4th questions related to the use of main and auxiliary elements in a sentence, which is covered by the first and second learning outcomes, the students were asked to produce sentences in which the subject would be used as the main element and the object would be used as the auxiliary element. When compared to the other elements of a sentence, the subject and object are elements more frequently encountered by students. The students' previous learnings about nouns and types of nouns may have contributed to their correct answer to this question. As the determination of the stressed element in a sentence is addressed for the first time within the context of the subject of sentence structure, it can be seen as normal for some students' not having information about it. In the post-test and retention test, the number of correct responses given to the 3rd and 4th and 6th and 7th questions was found to be higher than that of the correct responses given to the 1st and 2nd questions. This might be because of the fact that the students have better understood and internalized how to determine the main and auxiliary elements covered by the first and second learning outcomes than how to determine the stressed element covered by the third learning outcome and that they themselves constructed the sentences and could more easily responded to the implementation-oriented questions. Though there is not much difference between the experimental group students' and the control group students' pre-test responses to the 5th question, which is in the stage "analyze", requiring the disintegration of a sentence into its elements, the difference widened in the post-test and retention test. The stage "analyze" is the highest stage in OEQF. In this stage, higher achievement attained by the experimental group than the control group shows that the instruction including the use of digital storytelling is more effective than the current instruction in terms of nurturing students' higher order thinking skills.

As can be seen in Table 5, prior to the implementation, the experimental group's number of correct answers is 195 while the control group's number of correct answers is 157. In the post-test, the experimental group's number of correct answers was found to be 313 in total while it is 244 in the control group. Thus, while the increase in the experimental group students' number of correct answers is 118, it is 87 in the control group. This shows that the number of correct answers in the experimental group increased more than that in the control group. When the numbers of the correct answers found in the retention test administered four weeks after the completion of the implementation were examined, the number of the correct answers in the experimental group was found to be 313, it was found to be 234 in the control group. This shows that there is no decrease in the experimental group students' number of correct answers in the retention test when compared to the post-test. The fact that there is no loss in the number of correct answers in the experimental group indicates that the instruction given through digital storytelling to make the students grasp the phrase-meaning relationship is influential on the long-term retention of the learned information. The number of the control group students' correct answers decreased by 10% to 234 in the retention test when compared

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to the post-test. This decrease in the number of the control group students' correct answers may mean that the current instruction delivered to the control group tends to lose its effect in the long-term. When all the process is considered, it is seen that the increase in the number of the experimental group students' correct answers during the period extending from the pre-test to the retention test is 118 while it is 77 in the control group. This shows that the instruction given through digital storytelling for teaching the phrase-meaning relationship is more effective in eliminating misconceptions and retention of the learned information than the current method.

The findings obtained from OEQF support the quantitative findings which show that the experimental group students' academic achievement test scores are higher than those of the control group students.

Findings Obtained from the Student Interviews

In order to elicit the students' opinions about the instruction given through digital storytelling to make the students grasp the phrase-meaning relationship, one-to-one interviews were conducted with the experimental group students (n= 21); nine questions found in the interview form developed by the researcher were directed to the students. The findings obtained from the student interviews are presented below:

When the students' opinions about the feelings aroused by the digital storytelling method (*1st question)* were examined, we found that nineteen students expressed positive opinions, one student expressed negative opinions and one student expressed opinions evaluated in the others category. Some of the positive opinions expressed as follows: (D1): *"I felt happy. The lessons were more enjoyable."*; (D11): *"There was no rule, it was very enjoyable to study in this way, it was not boring. In this way, it was easier for me to remember what I have learned because I could immediately remember the plot of the story. I liked this."*. As a result of the analysis, on the basis of the students' positive opinions, the following codes were reached "enjoyable (f.5)", "interesting (f.3)", "nice (f.3)", "different (f.3)", "more freedom (f.1)", "better retention (f.1)". While most of the students expressed positive opinions (f.19), one student expressed negative opinions as follows (D18): *"In my opinion, it would be better if my teacher told the story himself/herself."* Thus, it can be claimed that the digital storytelling method was found to be inadequate by this student for understanding the subject and this aroused negative feelings on this student. Thus, the code "inadequacy of storytelling" was reached. One student (D17): expressed his/her opinions as follows: *"It is sometimes positive, sometimes negative because when a student feels concerned about an extracurricular issue, nothing makes him/her interested."*. Thus, besides how interesting the method is students' mood during the lesson can be effective in developing positive attitudes towards the course. In this connection, the code "change of mood" was obtained.

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When the students' opinions about the effect of the digital storytelling method on their achievement (*2nd question)* were examined, we found that fifteen students expressed positive opinions, while six students expressed opinions considered in the "others category". There is no student expressing negative opinion on this issue (D1): *"I was able to solve more problems; positively affected my achievement.";* (D12): *"It affected positively, I was able to understand how such issues are observed in our life."*; (D19): *"Its effect was nice. As I had fun, I learned better."* As a result of the analysis, on the basis of the students' positive opinions about the effect of the digital storytelling method on their achievement, the codes "learning better (f.4)", "facilitating learning (f.3)", "better retention (f.3)", "increasing achievement (f.2)", "solving more questions (f.1)", "making observation (f.1)" were reached. Though high majority of the students (f.15) expressed positive opinions, two students stated that (D4): *"First I felt a bit confused. After I have understood the subject, I felt better."*; (D15): *"It first made me a bit confused, then I realized that I had understood better."* In light of the opinions of these two students, we can argue that the use of digital storytelling first caused some confusion in the students, thus, made learning more difficult for them; yet, after they had become familiar with the method, it became easier and more convenient for them to learn. On the basis of these opinions, the code "first negative and then positive effect code" was reached. Four students seemed to be of the opinion that digital storytelling had neither positive nor negative effect on their learning by stating; (D1): *"It did not have much effect.*"; (D16) "*It did not affect much, in fact.";* (D20): "*In think it didn't change.";* (D21): "*In my opinion, it was the same."* On the basis of these opinions, the code "ineffective" was reached. The students did not express any opinions indicating that digital storytelling negatively affected their achievement.

When the students' opinions about whether they would prefer the digital storytelling method for the teaching of other grammar subjects to be taught in the future (*5th question*) were examined, it was found that 15 students expressed positive opinions, 2 students expressed negative opinions and 4 students expressed opinions evaluated in the category of others. (D1): *"Yes, because it was more enjoyable."*; (D2): *"Yes, I want, it makes it easier to learn.";* (D5): *"Yes, I remember better."*. As a result of the analysis, on the basis of the positive opinions expressed by the students about the use of digital storytelling for the teaching of other grammar subjects in the future, the categories "better understanding (f.8)", "making learning easier (f.5)", "enjoyable (f.2)", "better retention (f.1)" were obtained. While most of the students (f.15) expressed positive opinions, two students (D16, D18): expressed negative opinions about the use of digital storytelling for the teaching of other grammar subjects in the future; yet, they put forward no reason for their negative opinions. On the basis of these negative opinions, the code "not wanting" was obtained. Three students indicated that not all but some of the grammar subjects can be taught with this method by stating (D10): *"It changes depending on the subject to be taught. Some grammar subjects are easier to learn by talking.";* (D17): *"It can be sometimes used for teaching some subjects because if you use it frequently, you can get bored."*;

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(D21): *"Some subjects can be taught. For example, it can be good for the teaching of ambiguous sentences. We learn it better."* On the basis of these opinions, the code "partially "depending on the subject)" was obtained. One student (D4): stated *"It does not make any difference. We are studying the same subject in both of the methods."*. On the basis of this opinion, the code "undecided" was reached.

When the students' opinions about whether they prefer to use the digital storytelling method as a method of delivery of Turkish lessons in the future (*6th question*) were examined, it was found that 18 students expressed positive opinions, 1 student expressed negative opinions and two students expressed opinions evaluated in the category of others. Some of the positive opinions are as follows: (D10): *"I want. It is more enjoyable, I can understand better and more easily.";* (D21): *"Yes, the topics related to life can be taught better in this way. We can use it in our daily life, we can learn better."*. On the basis of the positive opinions expressed about the use of digital storytelling in the delivery of future Turkish lessons, the following codes were derived; "better understanding (f.10)", "making learning easier (f.6)", "enjoyable (f.2)", "better retention (f.1)", "relating to life (f.1)". While most of the students expressed positive opinions (f.18), only one student (D16) stated: *"Yes, they can be delivered but some people may not understand like me."*. On the basis of the opinion of this student, the code "not comprehensible" was obtained. Two students on the other hand stated that they prefer its use in the delivery of some lessons but not all and emphasized that for this method to be effective, students' attention is of vital importance as follows; (D17): *"Sometimes. When watched carefully, they can be really good, I think";* (D18): *"It can be in some lessons. When a lesson gets boring, it can be used to arouse students' interest in some part of it."* On the basis of these opinions, the code "partially (depending on students' state of attention/in some part of the lesson)" was obtained.

The students' opinions about whether the digital storytelling method should be used as a method of instruction in other courses *(7th question)* were examined, it was found that 19 students expressed positive opinions and 2 students expressed negative opinions. On the basis of the positive opinions expressed about the use of the digital storytelling method as an instructional method in other courses, the codes "mathematics (f.7)", "science (f.7)", "English (f.7)", "revolution history (f.4)", "social studies (f.2)", "all the courses (f.1)" were obtained. While most of the students (f.19) expressed positive opinions, two students (D18, D20): expressed negative opinions about the use of the method as an instructional method in other courses; yet, they did not provide any reasons for their negative opinions. Thus, on the basis of their opinions, the code "not wanting" was obtained.

When the students' opinions about the effect of teaching the subject of sentence structure by bringing the meaning to the fore through the establishment of the phrase-meaning relationship on their learning *(3rd question)* were examined, it was found that 18 students expressed positive opinions and 3 students expressed negative opinions. Some of the positive opinions are as follows: (D10): *"It made the meaning deeper in the sentence, which somehow made my learning easier."*; (D17): *"It created a*

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good effect because we could not remember later when we memorized the questions but now we focus more on meaning, leading to better retention.". As a result of the analysis, the following codes were obtained on the basis of the students' positive opinions about the effect of teaching the subject of sentence structure by bringing the meaning to the fore through the establishment of the phrase-meaning relationship on their learning "making learning easier (f.16)", "better learning (f.2)". While most of the students (f.18) expressed positive opinions, 3 students stated (D1, D16): *"It made me confused."*; (D18): *"It made it more difficult for me."* On the basis of these opinions, the codes "creating confusion" and "making learning more difficult" were obtained.

When the students' opinions about their use of what they have learned in the lessons by relating them to the real life *(4th question)* were examined, it was found that that 17 students expressed positive opinions and four students expressed negative opinions. Some of the positive opinions expressed by the students are as follows: (D3): *"Yes, I can use it. I am observing the environment and questioning the meaning of what I have seen."*; (D5): *"Sometimes. While I am walking, I am making observations."*; (D10): *"Sometimes. For example, when I go to market place, while buying some fruits and vegetables, we must think about weights."*As a result of the analysis, on the basis of the students' positive opinions about the use of what they have learned in the lessons by relating them to the real life, the code "using (f.17)" was obtained. While most of the students (f.17) expressed positive opinions, 4 students (D6, D18, D20, D21) expressed negative opinions about the use of what they have learned in the lessons by relating them to the real life; yet, they did not state any reasons for their negative opinions. On the basis of their opinions, the code "not using" was obtained.

When the students' opinions about the difficulties they experienced during the instruction *(8th question)* were examined, it was found that while only 1 student expressed positive opinions, 18 students expressed negative opinions. Two students on the other hand did not express any opinions. One student stated that he/she did not experience any difficulties related to learning throughout the process (D20): *"All of them were easy, I did not have any."* On the basis of his/her opinions, the code "not having difficulty" was obtained. Eighteen students stated that they had experienced difficulties. Some of the students' opinions about the difficulties experienced as follows: (D1): *"As I was used to the terms, at first I found it strange to use words such as place, time instead of adverb of place and adverb of time."*; (D17): *"I had some difficulties in relation to new names. I had some difficulties as I first tried to memorize them. Then it became easier as I started to understand."* As a result of the analysis, on the basis of the negative opinions of the students, the following codes were obtained "feeling confused in naming (f.8)", "subject-object distinction (f.3)", "adverbial clause (f.2)", "object (f.2)", "passive subject (f.1)", "the distinction between object and adverb of place (f.1)", "being different (f.1)".

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When the students' suggestions for the alternative activities aside from the ones having been used in the study *(9th question)* were examined, it was found that while 7 students stated that the activities were enough, 14 students made suggestions for alternative activities. As a result of the analysis, on the basis of the students' opinions, the following codes were obtained; "finding the activities enough (f.7)", "playing games (taboo, silent film etc.) (f.4)", "using sports (f.2)", "making whole class sentence analysis (f.1)", "assigning project works (f.1)", "using tales, jokes and songs (f.1)", "making observations (f.1)", "acting out (f.1)", "shooting a film together (f.1)".

The models representing the students' opinions about the teaching of the phrase-meaning relationship through the use of digital storytelling were drawn in NVivo 10 program package. The models drawn are presented in Figure 2, Figure 3 and Figure 4:

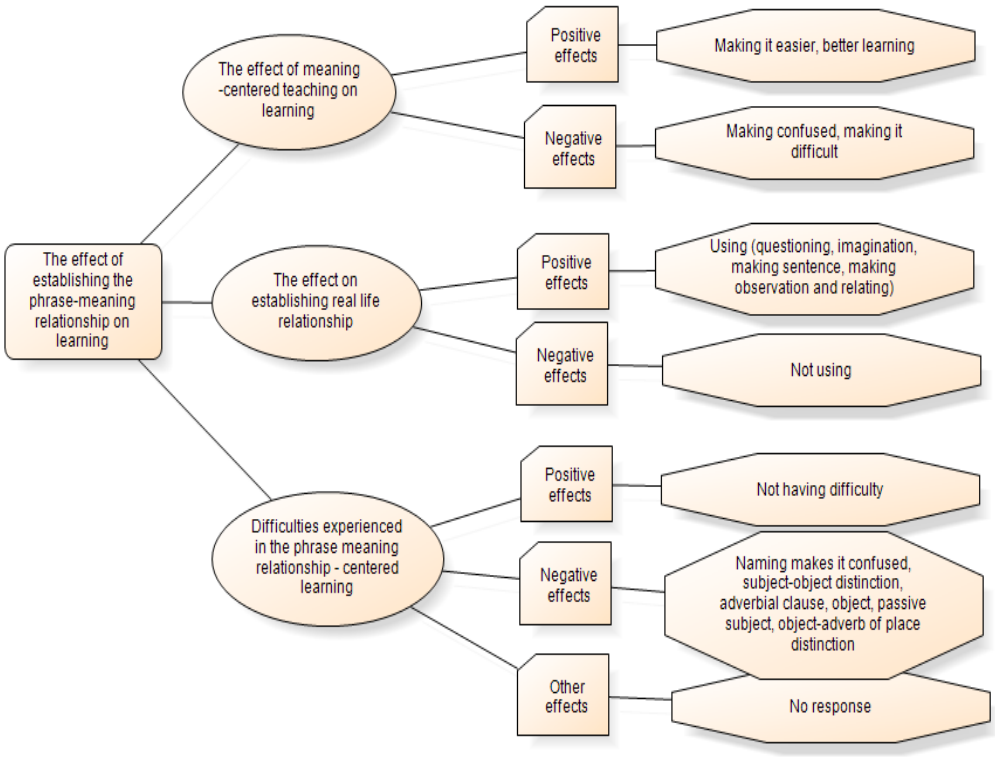

Figure 2. Students' Opinions about the Effect of Establishing the Phrase-Meaning Relationship on Learning

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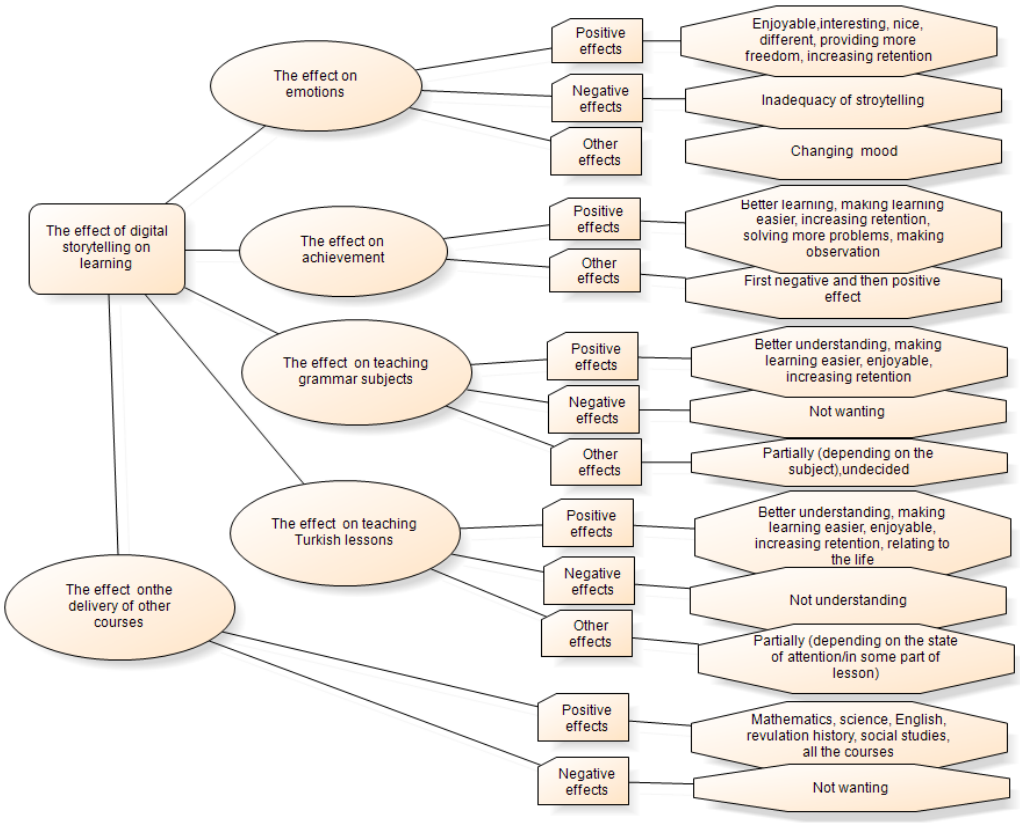

Figure 3. Students' Opinions about the Effect of Digital Storytelling on Learning

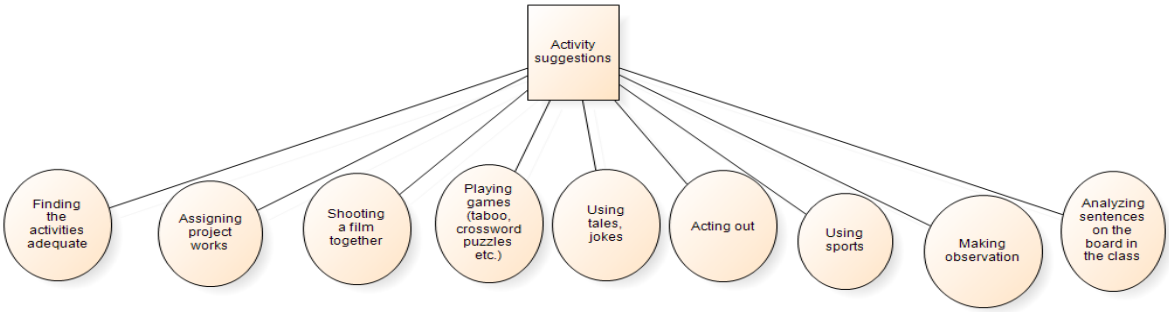

Figure 4. Students' Activity Suggestions

In Figure 2 and Figure 3, codes, categories, analysis units and themes constructed on the basis of the students' opinions are shown. Here, the octagon figure shows the codes; the note card figure shows categories under which the codes are combined; ecliptic figure shows analysis units (related questions) and the rectangle figure shows the themes. In Figure 4, the round figure shows the codes derived from the students' suggestions for activities and the square figure shows the analysis unit (the related question) for which these codes were determined.

When the students' opinions are subjected to a general evaluation, it can be seen that the students have positive opinions in general about both the digital storytelling method and the teaching

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of sentence structure by bringing the meaning to the fore through the phrase-meaning relationship; thus, they have developed positive attitudes towards them. Moreover, the students are also of the opinion that digital storytelling and the teaching focusing on making the phrase-meaning relationship understood had positive effects on their achievement. The students' negative opinions did not cover the whole learning process; rather, they experienced problems mostly stemming from their unfamiliarity with this new method. The students stated that their learning became more enjoyable and easier as they solved their problems through relating what they have learned to the real life by conducting implementations and making observations. In general, the students suggested alternative activities that would relate their lessons to the real life. Thus, we can argue that the students' liked the meaning-centered teaching by establishing the phrase-meaning relationship and that they would like more activities from the real life to be incorporated into lessons.

The findings derived from the students' opinions support the quantitative findings indicating that the experimental group students' academic achievement test scores are higher than those of the control group students.

Results, Discussion, and Suggestions

Results and Discussion

The current study aimed to determine the effect of making students understand the phrase-meaning relationship through digital storytelling on academic achievement and retention. The analyses conducted have revealed a significant difference between the experimental group and control group students' academic achievement levels and we concluded that the instruction given to make students understand the phrase-meaning relationship through digital storytelling makes greater contribution to the students' learning than the current method. Similar findings were also obtained from the open ended question form (OEQF) administered to determine the students' misconceptions and to support the findings obtained from the academic achievement test. When the results obtained by the experimental and control groups from the OEQF pre-test, post-test and retention test were examined, we saw that the misconceptions of the control group students decreased more than those of the control group students. This shows that instruction given to make the students understand the phrase-meaning relationship through digital storytelling is more effective than the current method in terms of eliminating the students' misconceptions and retention of the learned concepts. This result obtained from OEQF supports the quantitative findings showing that the experimental group students' achievement test scores are higher than those of the control group students.

The results obtained from the academic achievement test and OEQF show that the instruction given to make the students understand the phrase-meaning relationship through digital storytelling had a positive effect on academic achievement. When the experimental group students' opinions about the effect of the method on their achievement were examined, we saw that the students

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most strongly emphasized that the method made better learning possible. The factors making the students believe that the method had positive effects on their learning were stated to be its making better learning possible, making learning easier, enhancing retention, enabling students to relate what they have learned to their real lives and thus enabling them to solve more problems and to make more observations. We think that there are two reasons for this positive effect. One of them is internalization of what has been learned through focus on meaning rather than rote-learning. In the existing research (Coşkun, Özkaya, & Uysal, 2017; Işık, 2012; Özkaya & Coşkun, 2017; Polat, 2014; Şaf, 2010; Uysal & Bardakçı, 2014), the researchers are of the opinion that the traditional approach preferred instead of the meaning-centered approach remains inadequate in fulfilling the objectives set in the program; that grammar teaching focusing on meaning and usage besides form affects the learning process positively; that teaching the subject of sentence structure, which is a source of confusion for many students, as terms used are usually confusing, through an approach involving progression from meaning towards term allows the inculcation of basic and advanced language skills and establishing the phrase-meaning relationship; that making sentence analysis considering the meaning makes it possible to discover the deep structure of a sentence, to establish language-thought-imagination relationship and to uncover the richness of the language. These results reported in the literature support the finding of the current study pointing out that the instruction given to make the students understand the phrase-meaning relationship through digital storytelling is more effective than the traditional method in terms of increasing achievement. One of the reasons for the experimental group students' being more successful than the control group students is the organization of the educational and instructional activities in compliance with the requirements of the age by utilizing information technologies and provision of multi-dimensional learning environment. In other studies (Abu Naba'h, 2012; Akbaba, 2007; Akkaya, 2011; Durukan, 2011; Özkoyuncu, 2016; Saeedi & Biri, 2016; Yağcı, 2002), it has also been revealed that the technology-assisted grammar teaching using visual materials is more effective in increasing academic achievement than the traditional method.

In the current study, in order to make use of information technologies to increase students' interest and achievement, the digital storytelling method, which allows the integration of stories with information technologies and the presentation of the subject within a context of a story in such a way as to appeal to different senses, was used. In research focusing on the use of the digital storytelling method in education, it has been found that this method makes positive contributions to the development of students' academic achievement (Demirer, 2013; Göçen, 2014; Nam, 2017; Özerbaş & Öztürk, 2017; Sever, 2015; Yang & Wu, 2012). This shows that this method is effective in increasing the academic achievement of different groups. Moreover, in this research, we also concluded that the digital storytelling method has some positive effects on the development of language skills (Baki, 2015; Balaman Uçar, 2016; Ciğerci, 2015; Çıralı, 2014; Kulla Abbott, 2006; Özer, 2016; Tabak, 2017; Yamaç, 2015). These findings concur with the finding of the current study

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showing that the digital storytelling method is more effective than the traditional method in terms of enhancing the students' academic achievement.

In the interviews conducted in the current study, the students made suggestions for alternative activities that would make relating what had been learned to their real life possible. Thus, it was concluded that the students liked the meaning-centered learning by establishing the phrase-meaning relationship and wanted more activities to be included in classes to relate what had been learned to the real life. The findings derived from the students' opinions support the quantitative findings showing that the experimental group students' academic achievement test scores are higher than those of the control group students.

One of the purposes of the current study is to investigate the retention level. When the experimental group and control group students' achievement scores taken from the pre-test to the retention test were examined, we found that when compared to their pre-test scores, both of the groups increased their post-test scores but this increase also continued in the retention test for the experimental group while the control group students experienced a drop in the retention test. The fact that no decrease was observed in the experimental group students' achievement scores throughout the whole process shows that the instruction given to the students to make them understand the phrase-meaning relationship through digital storytelling has long-term positive effects on the students' achievement. The same hold true for the results derived from OEQF. The instruction delivered to the experimental group students to make them understand the phrase-meaning relationship through digital storytelling seems to be effective in the long-term retention of the learned concepts. During the instruction delivered to the experimental group students, taking meaning to the center and appealing to different senses of students through digital storytelling are factors contributing to the retention of the learned information.

Teaching the subject of sentence structure on the basis of the phrase-meaning relationship makes it possible for students to discover the possibilities of a language and relate what they have learned to the real life. By relating to the real life, students can find opportunities to use what they have learned in their real life; thus, learning becomes more permanent. Khan (2007) stated that teaching grammar rules via the deductive approach enabled the students to get high marks from the exams in the short-term but caused problems as what was thought was not related to the real life. In the current study, the experimental group students stated that they were able to use what they had learned in the real life by questioning, imagining, making observations and relating to the real life. Students' relating what they have learned in the class to the real life by constructing them in their minds is the basic tenet of the constructivist approach. In this regard, the students in the current study were able to relate what they had learned in the class to their real lives as a result of greater emphasis put on meaning and the phrase-meaning relationship in their instruction. Relating what has been

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learned in the class to the real life can be made possible by bringing the real life to the class through the practice-oriented activities and technology-enhanced activities such as digital storytelling (Kurudayıoğlu & Bal, 2014). The digital storytelling method allows the presentation of the text enhanced with sounds, graphs, act-outs and music and the creation of a multimedia-learning environment in the class.

A large amount of research has been conducted on the creation of a multimedia environment in education. The dual coding theory developed by Paivio is based on the processing, coding and retention of information according to the structural and functional characteristics of the system of verbal and non-verbal coding. According to this theory, presenting oral and visual content together makes learning more efficient. The use of more than one channel in the coding increases the effect on the permanence of the learning (Aldağ, 2005; Aldağ & Sezgin, 2002). In the research conducted on the subject, researchers have found that the use of information technologies that enable the creation of multimedia in which binary coding is made has a significant effect on academic achievement and retention. In his research on the relationship between the use of information technologies and memory, İmren (2015) found a positive relationship between the use of multi-media and working memory. Çıralı (2014), in his research, concluded that digital storytelling is more effective on the visual memory than on the current teaching, although there is no significant difference. The conclusion that the storytelling method based on information technologies provides a more lasting learning than the current teaching was also reached by Kahraman (2013).

Digital storytelling was created by blending the storytelling method with information technologies. Therefore, the two components have a role in the method's impact on permanent learning. Dağıstan (2015) found that the storytelling method, one of the memory-enhancing strategies, has significantly affected the vocabulary achievement and retention of the learned words. The storytelling method is effective in the realization of permanent learning as it allows the construction and transmission of what is required to be taught within a text context. In language teaching, creation of contexts and making use of texts for this purpose are of great importance. The teaching of grammar within a context and the importance of the quality of the texts to be selected for this purpose have been emphasized in the literature (Çeçen, 2007; Derman, 2008; Şenol, 2013; Kanat, 2016). In the study conducted by Özkoyuncu (2016), it was concluded that the use of information technologies, which is the other component of digital storytelling, increased the retention of the learned information more than the current instruction in grammar teaching.

As a conclusion, the instruction delivered to make students understand the phrase- meaning relationship by means of digital storytelling was found to be more effective in terms of increasing the middle school 8th graders' academic achievement and retention than the current method.

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Suggestions

Practice-oriented Suggestions

- Grammar subjects should be taught through enrichment with meaning-centered methods and techniques by relating them to the real life rather than on the basis of abstract rules and students should be encouraged to question what they have learned and to use and relate them to the real life.
- The current research only focused on the phrase-meaning relationship within the context of the subject of sentence structure of Turkish grammar. Other grammar subjects can be taught by relating them to the real life by means of digital storytelling.
- The students were found to have experienced some difficulties in the initial stage of the process as the digital storytelling method used in the process was unfamiliar to them and different from the methods they were used to. Thus, for students to get acquainted to the method, they can be given more time and practice.
- The digital stories used in the current study were prepared by the researcher and shared with the students in the classroom environment. Activities can be organized for students to develop digital stories and present them.
- When the students' activity suggestions for the course were examined, we saw that they mostly suggested activities that would enable them to relate what they have learned to the real life. In this connection, students can be enabled to relate what they have learned to the real life through extracurricular social activities.

Suggestions for Researchers

- In the current study, two 8th classes in Cumhuriyet Middle School in the city of Muğla were selected as the study group. The study group can be expanded by including classes from different schools. In this way, more data can be obtained about between-groups differences.
- The current study investigated the effect of the instruction given to the students to make them understand the phrase-meaning relationship by using digital storytelling on their academic achievement and retention. The effect of the use of meaning-centered instruction and the digital storytelling method on academic achievement, attitude and retention can also be tested within the context of teaching subjects in other courses such as science, social studies, English and history.
- In the existing research, positive effect of the digital storytelling method has been reported on writing and reading skills. In the current study, the effect of the method on grammar teaching providing the basis for all the basic language skills was explored. The effect of this method on speaking and writing kills can be researched.
- A meta-analysis study can be conducted on the effect of the digital storytelling method on the development of language skills.

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- Given that the digital storytelling method address many senses such as visual and auditory simultaneously, different methods and techniques can be developed for students experiencing difficulties in relation to one or some of these senses while studying the phrase-meaning relationship.
- Given that the digital storytelling method is interesting and increasing achievement, seminars and in-service training programs can be organized in cooperation with the Ministry of National Education to make this method more widespread among teachers.
- Meaning-centered digital stories directed to teaching of all the subjects and objectives in the curriculum can be prepared and made available to all teachers over a network within a context of a project so that grammar subjects can be related to the real life and taught more easily.

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