Concept Mapping in Turkish Grammar Instruction:
A Quantitative and Qualitative Research Study[1]

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Abstract: The purpose of this research study is to determine the effect of the concept mapping technique when used in Turkish grammar lessons upon the achievement of lower secondary school (which is part of the primary education system in Turkey) students. The sample in the present study consists of 95 students consisted of 95 students who were studying either in private or state lower secondary schools in Istanbul in a 'Parts of Speech Achievement Test,' which has been developed by researchers. The reliability of this test was established with Cronbach's alpha (0.821). Mann Whitney U and Wilcoxon Tests were used for the data analysis. Furthermore, some lessons of the experimental group were video-recorded and those students were interviewed. The results of the research denote that concept maps enhance the success of students in Turkish grammar compared to more conventional methodology and that they enhance student participation and motivation. Some suggestions concerning the technique of concept mapping in Turkish schools have also been put forth.

Key words: Turkish grammar instruction · Concept mapping technique · Lower secondary school students (Students from the second part of Turkish primary education schools)

INTRODUCTION

First language acquisition, which is acquired informally from the day a child is born, assumes a formal character via life at school. First language education within the instructional process in primary education teaches the structures of the patterns the student already knows and uses on the one hand and aims at the correct use of the expressional richness of the language in a way that enables one to communicate effectively on the other.

The rules and concepts concerning language are very important in order for individuals to successfully perform activities involving oral and written expression. Concepts are expressed through language and used in interpersonal communication. Language, which is the means of expression of concepts, possesses some concepts which belong to its own structure as a system of communication. The possession of the concerned concepts assists individuals in performing the communicative function of language.

Grammar instruction includes the practices involving the development of existing awareness of the language through the instruction of the first language children have already been using. From this perspective, grammar instruction exercises a function in the development of the four basic skill areas. But, when the existing applications in Turkish primary education schools (Turkish primary education schools consist of primary school and lower secondary school) are considered, grammar lessons do not fulfil their purposes in a proficient manner. Within this context, the use of conventional methodologies, which are more teacher-centred than student-centred and which involve rote learning both reveal the insufficiency of the existing practices and the requirement for the employment of more novel methodologies.

Instruction centred on abstract rules and concepts are included in the grammar lessons. The tendency to memorise grammar concepts and definitions which occur in students is a hindrance for permanent learning. One of the techniques which can be used in the acquisition of the concepts and inter-conceptual relationships is concept maps. The concept map is a technique which permits a visual representation of concepts concerning a topic and reveals the relationships among them as a whole.

As research in Turkey has made clear, concepts maps, which have been widely used in educational fields

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such as physics [1], chemistry [2], biology [3], science [4,5] and mathematics [6,7], have not yet become popular in grammar instruction.

Concept mapping is a technique involving the generation, organization and analysis of qualitative data. It helps groups to organize complex and diverse ideas into an understandable and coherent framework [8]. Expressing the concepts and the relationships among them visually through drawings, contributes to meaningful learning.

The evidence provided by the students show that concept mapping allows for an organised approach to learning, from the known to the unknown, from the core concept to the subordinate, illustrating how knowledge can be organised for cognitive retention through an analytical approach. As now recognised by the facilitators participating in the module delivery, concept mapping provides excellent planning tools for making the process of knowledge explicit and easy to construct and integrate [9].

Undoubtedly, we may develop new concept relationships in the process of drawing concept maps, especially if we seek actively to construct propositional relationships between concepts that were not previously recognized as related: Students and teachers constructing concept maps often remark that they recognize new relationships and hence new meanings as a result. In this sense, concept mapping can be a creative activity and may help to foster creativity [10].

Concept mapping provides a new perspective on developing course material, thereby allowing instructors to improve course content, challenge prior convictions and become more effective educators. More importantly, students are encouraged to accept responsibility for their own learning, develop intellectual curiosity and acquire an effective learning strategy that will serve them for their lifetime [11]. Furthermore, mind mapping facilitates the organisation and recalling of knowledge in students' minds.

A number of theoretical and practical studies have stressed that concept mapping as an instructional strategy is effective in first language teaching. In one study in which concept mapping has been investigated as a teaching strategy for English as a second language [12], it was found that the group, consisting of 79 students who employed concept mapping, attained higher academic achievement on a statistically meaningful level than that of the individual study group; and that concept mapping is influential in the development of students' self-regulation (*self-regulation*: students' activities of motivation and behaviour for the process of learning) skills.

Other studies [13,14] support the view that concept mapping is a useful tool. Other than that, there are other studies about the use of concept mapping in instruction for listening [15] and for reading [16].

In English, the relationship between two concepts is easily expressed by writing the ver bor a preposition on a connecting line. As a concept map is read, the basic SVO structure of the sentence is established and a correct sentence is formed. On the other hand, the basic word order in Turkish is subject-object-verb (SOV). As a SOV language where objects precede the verb, Turkish has postpositions and suffixes rather than prepositions and adjectival pronouns [17]. For that reason, Turkish syntax has been regarded as essential in the implicational procedure of the study. (See Appendix 1)

This study aims to research whether the use of concept mapping technique in the instruction of grammar in Turkish courses in lower secondary schools (which is the second part of Turkish primary education) in Turkey is influential in the achievement of students and for learning concepts. Furthermore, the second purpose of the study is to determine whether lessons taught through concept mapping are different from the lessons taught through conventional methodology in terms of achievement and concept learning.

MATERIALS AND METHODS

Multiple methods, which employed both quantitative and qualitative techniques, were used in the research. Multiple methods are suitable where a controversial aspect of education needs to be evaluated more fully [18]. Often the desire to use multiple methods arises because you want to get at many different aspects of a phenomenon [19].

Quantitative data were gathered through the 'Part of Speech Conception Test.' The research has an experimental character and '*pre-test post-test experimental group trial model*' has been employed. Within this model, the existence of pre-tests contributes to knowing about the a priori degrees of affiliation of the groups and correcting the results accordingly [20]. Qualitative data have been gathered through interviews and video-recording. Qualitative researches stress the socially constructed nature of reality, the intimate relationship between the researcher and what is studied

and the situational constraints that shape inquiry [21]. In total, two primary education schools, one private and one state school whose socioeconomic levels are different, were chosen for the purposes of this research effort. Experimental and control groups have been formed from 7th graders. The levels of conceptual learning about the "Parts of Speech" in the 7th grade students (as from the second part of Turkish primary education schools) have been evaluated. The topic "Parts of Speech" was covered in conventional methodology (delivery of the lesson directly by the teacher) in the control group, whereas it was covered by concept mapping technique accompanied by conventional methodology in the aforementioned schools. Before the implementation, all groups took the 'Parts of Speech Conception Test' as pre-test and the answers given by the students have been evaluated. By the end of the practice, all groups have taken the 'Parts of Speech Conception Test' as post-test and the conceptual development of the students were studied.

Population and Sample: The universe of the research consists of all the 7th graders in one private and one state primary education school in the Uskudar district of Istanbul Province. This choice was made in order to determine whether student achievement differentiates according to their socioeconomic level. Furthermore, the sample group was chosen among 7th graders, because students in this age overlap with the formal operational stage (age 11/15) in terms of cognitive development. The sample group consists of 95 students who were studying in classes 7/A and 7/B in one private and one state school in the Uskudar district of Istanbul Province in the 2005 / 2006 Academic Year. 40% of the students (38 people) were in the private primary education school and 60% of the students (57 people) were in the state primary education school. 18,95% of the students (18 people) were in the private primary education school experimental group and 21,05% of the students (20 people) were in the control group. 31,57% (30 people) of the state primary education school students were in the experimental group and 28,43% (27 people) were in the control group.

Instruments for data gathering: A 40-question achievement test with four choices for each question to measure the topic "Parts of Speech" was devised. The acquisitions from the Turkish course were considered when the questions were being prepared. The content validity of the achievement test was checked by three experts from the subject area and Turkish teachers in the

practice schools and was found valid after relevant modifications had been undertaken. Furthermore, a total of eight students from each group studied the achievement test and points which they could not understand were note-taken by the researcher and relevant modifications were made. The reliability of the achievement test has been established with Cronbach's alpha ($\alpha = .822$, number of items: 40).

The aim was to determine the ideas of the experimental group students about concept maps through an interview form used in the research. A *'Standardised open-ended interview'* has been used in the research. This approach consists of a set questions carefully worded and arranged with the intention of taking each respondent through the same sequence and asking each respondent the same questions with essentially the same words [22]. This approach reduces the partiality and subjectivity of interviewer. As asking the same questions in a systematic order to all subjects minimises the impacts and his / her subjective judgements and comparison and analysis of the data gathered through that approach is easier [23]. As used in the study, a *'Standardised open-ended interview'* is said to permit comparability between responses, it relies upon structure while a calculate number of people are interviewed so that we are representative of the population for the purposes of generalization [24].

Researchers who work with videos have access to many non-verbal clues [19]. Therefore, some of the lessons of the experimental group were video-recorded and subsequently evaluated qualitatively. Before being video-recorded, students were informed that the data would be gathered for a scientific study and that the recordings would not be used elsewhere whatsoever and thereby it was taken for granted that they ignored the recordings. Video-recordings took place over three weeks and in the end the recordings were copied on Video Compact Disc (VCD).

Processing the data: Qualitative analysis techniques were used for the data analysis of the "Parts of Speech Conception Test," and the data analysed through the SPSS 11.5 packet program. The results of the achievement were scored out of 100 and each correct answer was given 2.5 points.

The normality of the variable distribution was investigated in order to determine which tests to apply. A Shapiro Wilk Test indicated that not all variables were normally distributed and therefore non-parametric tests were used in the further data analysis.

The pre-test scores of the experimental and control group were compared and analysed with a Mann Whitney U test. The same was done for the post-test scores. In addition the difference between pre and post-test scores were analysed with a Wilcoxon signed-rank test for paired samples.

The data for the video-recordings was compiled through the *'summative recording'* technique, which is based on the limitation of the material to collect in the stage of data gathering [25]. The *'Summative qualitative contents analysis'* technique was used for interpretative purposes. The target of summative qualitative contents analysis is the reduction of the material to certain points. Within the reduction, it is aimed at obtaining the core-content via signifying abstraction which allow the picture of the main material [25]. Video-recordings were evaluated many times and certain generalisations concerning student behaviour/responses and the dialogues between teacher and student were reached. Increasing level of abstraction is limited with the volume of the material, thereby certain semantic units (opinions, etc.), i.e. similar points, are integrated on one another and combined in summative qualitative analysis. Besides, certain central passages are preserved as they are and they are given in dialogue form [25].

The transcriptions of the interviews were analysed. Content analysis concerning the evaluations of the students was re-inforced. Content analysis is first the conceptualisation of the data collected and then their organisation logically in accordance with the arising concepts and thereby determining the theme which explains the data [23]. As for the kinds of content analysis *'categorical analysis'* was used. Dividing a certain message into units and then forming the units into categories according to the criteria determined beforehand is called "categorical analysis" [26].

Although researchers choose to organize their final data in a variety of ways, one method that has suited many of us is to establish a set of categories that arise from and make sense of our specific data [27]. First data are coded in categorical analysis. The coding is generated in accordance with the concepts which arise during the coding in addition to the concepts determined beforehand. Codes are symbols, usually numbers, which are used to identify particular responses or types of responses in questionnaire or similar instruments [28]. Consequently, categories (themes) which explain codes in general level were determined and findings were interpreted [23].

FINDINGS

According to Table 1, there is no meaningful difference between the row averages of the pre-test scores belonging to the experimental and control groups of private primary education school: The row average of the experimental group is 19,39; the row average of the pre-test scores of the control group is 19,60 (U=178,000; p>.05). The fact that there is no meaningful difference between the pre-test scores of the experimental group and control group demonstrates that the pre-knowledges of the group were in the same level before the implementation.

According to Table 2, there is no meaningful difference in the row averages of state primary education school experimental group and control group: The row average of the experimental group pre-test scores is 26,28; the row average of the control group pre-test scores is 32,02 (U=323,500; p>.05) The fact that there is no meaningful difference between the pre-test scores of the experimental group and control group shows that the two groups are similar.

According to Table 3, there is a meaningful difference in the row average of post-test scores of the experimental and control groups within the private primary education

Table 1: Mann whitney test values (pre test scores for the experimental and control group in primary education)

The groups	N	X	Row average	Row total	Z	U	p
Experimental Group	18	24.28	19.39	349.00	-0.059	178.000	0.953
Control group	20	24.20	19.60	392.00			
Total	38						

Table 2: Mann whitney test values (pre-test scores for the experimental and control group in primary education)

The groups	N	X	Row average	Row total	Z	U	p
Experimental Group	30	22.67	26.28	788.50	-1.318	323.500	0.188
Control group	27	24.63	32.02	864.50			
Total	57						

Table 3: Mann whitney test values (post-test scores for the experimental and control group in primary education)

The groups	N	X	Row average	Row total	Z	U	p
Experimental Group	18	71.83	27.08	487.50	-3.995	43.500	0.000
Control group	20	40.55	12.68	253.50			
Total	38						

Table 4: Wilcoxon test values (pre and post-test scores for the experimental group in primary education)

Pre-test Post-test	N	Row average	Row total	Z	p
Negative row	0	0.00	0.00	-3.726	0.000
Positive row	18	9.50	171.00		
Equals	0	-	-		
Total	18				

Table 5: Wilcoxon test values (pre and post-test scores for the control group in primary education)

Post-test Pre-test	N	Row average	Row total	Z	p
Negative row	9	5.00	45.00	-1.767	0.077
Positive row	9	14.00	126.00		
Equals	2				
Total	20				

Table 6: Mann whitney test values (post-test scores for the experimental and control group in primary education)

The groups	N	X	Row average	Row total	Z	U	p
Experimental group	30	52.30	39.17	1175.00	-4.880	100.000	0.000
Control group	27	30.70	17.70	478.00			
Total	57						

Table 7: Wilcoxon test values (pre and post-test scores for the experimental group in primary education)

Pre-test post-test	N	Row average	Row total	Z	P
Negative row	0	0.00	0.00	-4.706	0.000
Positive row	29	15.00	435.00		
Equals	1				
Total	30				

school in favour of the experimental group: the row average of the post-test scores of the experimental group (27, 08) is higher than the row average of the post-test scores of the control group (12, 68) (U=43, 500; p<.01).

When the results were studied, it became apparent that there was development in the level of learning concepts in each group. But it was seen that the row average of the post-test scores of the experimental group who study through concept mapping was higher than the row average of the post-test scores of the control group. The result denotes that concept mapping rather than conventional methodology enhances achievement in grammar instruction.

The Wilcoxon Test values, which denote whether concept mapping has a meaningful influence in learning grammar concepts before and after the implementation within the private primary education school are given in Table 4. The results of the analysis show that there is a meaningful difference between the pre-test and post-test scores of the students who participated in the research (z=-3, 726; p<.01). Considering the row total of the differing scores, the observed difference is in favour of the positive rows, i.e. the post-test.

According to those results, it could be ascertained that grammar instruction through concept mapping has a significant influence on developing students' grammar concepts.

The Wilcoxon Test was used in order to determine whether the influence of conventional methodology produced a meaningful change in students' learning grammatical concepts before and after the implementation. The results of the analysis show that that the level of learning concepts in those students who participated in the study increased, but there is no statistically meaningful change between the pre-test and post-test scores (z=-1, 767; p>.05).

According to Table 6, there is a meaningful difference in the row average of post-test scores of the experimental and control groups within the state primary education school in favour of the experimental group: the row average of the post-test scores of the experimental group (39, 17) is higher than the row average of the post-test scores of the control group (17, 70) (U=100, 000; p<.01).

The achievement in concept learning in both experimental group and control group in state primary education school had increased in the last implementation, when compared with the first implementation. But the row average of the post-test scores of the experimental group who study through concept mapping is higher than the row average of the post-test scores of the control group for whom conventional methodology is used. Considering the result it is possible to say that concept mapping enhances learning concepts in grammar instruction more than conventional methodology does.

The Wilcoxon Test values which denote whether concept mapping has a meaningful influence in learning grammar concepts before and after the implementation within the state primary education school are given in Table 7. According to the results of the analysis, there is a statistically meaningful difference between the pre-test and post-test scores of the students who participated in the research (z=-4,726; p <.01). Considering the row total of the differing scores, the observed difference is in favour of the positive rows, i.e. the post-test.

Those results denote that the grammar instruction through concept mapping has a positive influence on enhancing students' achievement.

The Wilcoxon Test results concerning the scores of the control group students before and after the

Table 8: Wilcoxon test values (pre and post-test values for the control group in primary education)

Post-test Pre-test	N	Row average	Row total	Z	P
Negative row	11	8.50	93.50	-1.861	0.063
Positive row	14	16.54	231.50		
Equals	2				
Total	27				

Table 9: Mann whitney U test values (pre-test scores in primary education)

School	N	X	Row average	Row total	Z	U	p
Private primary Education school	38	24.34	49.09	1865.50	-0.318	1041.500	0.750
State primary Education school	57	23.60	47.27	2694.50			
Total	95						

Table 10: Mann whitney U test values (post-test scores in primary education school)

School	N	X	Row average	Row total	Z	U	p
Private Primary Education School	38	55.37	59.57	2263.50	-3.341	643.500	0.001
State Primary Education School	57	42.07	40.29	2296.50			
Total	95						

implementation are shown in Table 8. According to the Table, there is a difference to a certain point. However, the difference is not statistically meaningful (z=-1, 861; p<.05).

According to Table 9, there is no statistically meaningful difference between the row averages of private primary education school pre-test scores and state primary education school pre-test scores: The row average of the pre-test scores of the students in private primary education school is 49,09 and the row average of the pre-test scores of the students in state primary education school is 47,27 (U=1041,500; p>.05).

The findings above show that the pre-knowledge of the sample group chosen among both schools was of an equal level. However, it has been seen that the pre-test average in private education school is higher than the pre-test average in state primary education school.

According to Table 10, there is a statistically meaningful difference between the row averages of the post-test scores of private education school and that of state primary education school in favour of the private primary education school: The row average of post-test scores of private primary education school (59,57) is

higher than the row average of the post-test scores of the students in state primary education school (40,29) (U=643,500; p<.01).

The fact that the students in the private primary education school experiential group have a higher level of achievement than those experimental group students who studied in the state primary education school could be explained by the higher level of preparedness for learning due to higher educational standards they have received in their prior education and could be explained by their familiarity with the use of contemporary methodologies rather than conventional methodologies.

Findings concerning the video-recordings: The teacher show the students a text in which there are sentences including adverbs. Students meticulously studied the text[2]

(5th December, 2005; 2 minutes and 28 seconds)

Teacher: Girls and boys let us study the highlightened words within the sentences and say their common features.

(The whole class meticulously studies the text. Having waited for a while the teacher asks the students the same question.)

Nazan: Sir, they precede the predicates and determine them.

Teacher: Yes, they precede predicates and precede mainly the verb.

Cihan: Sir, they precede adjectives and adverbs, too.

Teacher: Yes, that is it. Now let us study the highlightened words in terms of meaning, what do they indicate?

Ismail: Time...

Cengiz: Place, direction...

Teacher: Yes, girls and boys, look at the concept map. (The whole class studies the definition of adverb in the concept map carefully.) That is to say, adverbs 'are the words which strengthen or limit the meanings of adjectives, verbs and the words similar to itself in terms of time, place, direction, quantity and in terms of question.' Now let us say the most important feature of adverbs. What is it?

Sinem: They do not receive inflectional suffixes...

Teacher: All right, do adverbs receive derivational suffixes?
(Students discuss among themselves.)

On showing the text which includes the sample sentences concerning the relevant part of speech prepared by the researcher at the beginning of the lesson, the teacher promoted more active consciousness in the common features of the highlighted characters. Students studied the sentences with the utmost care. The participation in the lesson is at a very high level. The purpose at this stage was to get students to determine the common features of the words through the discovery learning strategy. Consequently, the concept map was treated again and the whole adverb issue is covered. In this way, it is observed that the teacher activates the students interest by using a question and answer technique in addition to concept mapping.

The teacher's question about whether adverbs receive derivational suffix created a discussion platform among students. Concept mapping to beneficial for learning and in supporting sustained small-group discussion of scientific ideas [29].

Additionally, those students who participated in the discussion operate at the highest cognitive level in a co-operative learning atmosphere. Within this context, concept mapping is thought to contribute to the generation of a social learning atmosphere.

The teacher wanted the students to find diverse examples in addition to the sentences prepared beforehand while he covers the lesson. At that moment it was observed that students were cognitively engaged in discussing among themselves and the teacher examines the students through diverse sentences. Consequently, the assessment process was stopped having covered the units of the issue gradually:

(5th December 2005, one minute and 33 seconds)

Teacher: Who wants to make sentences with place and direction adverbs?
(The students are discussing among themselves and they ask the point to the teacher.)

Bilge: Sir, why does not 'She has studied a little' become the adverb of quantity?

Teacher: Yes, it can be, 'a little' has not received a derivational suffix and it indicates quantity.

Serkan: Sir does the bow in the sentence 'The arrow has left the bow' become an adverb? (the translated Turkish sentence includes bow + inflectional suffix and the way sentence is made in Turkish differs from the way it is made in English)

Teacher: We talked that adverbs were not to receive inflectional suffix a short while ago. How quick you forgot. (Writing on the blackboard) Consider the adverb in the sentence 'The car turned to the left,' let me see... (the translated Turkish sentence includes left + inflectional suffix and the way sentence is made in Turkish differs from the way it is made in English)
(The students are discussing the issue in the classroom.)

Ayşen: 'To the left' does not become an adverb sir, because it has an inflectional suffix... And the meaning has not changed, either.
(There is the siren of the fire-engine outside. The whole class orients outside completely.)

Emir: 'Now' in the sentence 'the fire engine is passing now' becomes and adverb of time does not it sir?

Teacher: Yes...

In the implementation phase, it was observed that students brought their knowledge concerning grammar into the field of practice in the sentences they use in their daily lives. The efficiency of the students in the control group to use the relevant parts of speech in sentences has been found to be higher than that of the control group.

The crucial point in the video-recording concerned is that students concentrated their interest on the concept map, they studied them carefully and their motivation for the lesson was very high. Hence, in the interview data, the students said that their interests had been higher when concept mapping had been used and that the lesson had been easier and more comprehensible. The two findings support each other.

The Findings from the interviews: The data from the student interviews have been evaluated qualitatively. The codes were obtained through the evaluation and categories were generated through generalisation. As the student opinions and codes are extremely comprehensive in nature, they have not been cited here.

Table 11: The Categories Concerning the Data Through the Interviews

Categories
• Contributing to the learning process,
• Developing a positive attitude towards Turkish course,
• Maintaining permanence in learning,
• Positive structural features of concept maps,
• Maintenance of retention and recalling of knowledge,
• Enhancing lingual development,
• Motivation and participation,
• Determining the individual learning level,
• Performing learning activities,
• Motivation for the lesson,
• Providing instances for repetition,
• Facilitating learning,
• Utility in verbal courses,
• Utility in quantitative courses.

When the categories in Table 11 are considered in tandem with student opinions and codes, the following results become apparent: the students mentioned that 'Parts of Speech' as covered in a way which differs from other grammar lessons contributed to the learning process in terms of "easier comprehension, quicker learning, learning more, being practical and easy." Moreover, this novel method enabled the students to develop a positive attitude towards the Turkish course, not to get bored and to comprehend the lesson more easily. The students emphasised that concept maps maintained permanence in learning in that they consisted of shapes which could be studied again when desired.

According to the perception of the experimental group students, the concept maps used in the grammar lessons resulted in easy enjoyable quick learning; they have positive structural features such as "showing the inter-conceptual relationships, giving the concepts through examples, being simple and instructive, having brief explicit expression." Furthermore, concept mapping develops students' ability to make full and correct sentences, thereby contributing to their linguistic development in addition to facilitating the recall of knowledge reinforcing it.

The students individually drew concept maps at the end of the lesson or as homework assigned activity in the implementation process. These drawings contributed to student motivation and participation. They provide students with instances to notice their errors and mistakes and help students develop useful skills.

The students approved the use of concept mapping both in verbal courses (Social Studies, English, Religious Studies and Civics) and in quantitative courses (Science, Mathematics) in terms of developing a positive attitude towards courses and facilitating learning.

DISCUSSION

The experimental groups in the private primary education school and state primary education school which used concept mapping were found to be more successful than the control groups with which a conventional methodology was used. The fact that the post-test average of the experimental groups for whom concept mapping was used at either school is higher than that of the control group for whom conventional methodology was used denotes that concept mapping enhances achievement in Turkish grammar instruction. This is in line with the findings of other researchers which show concept mapping enhances achievement compared with conventional methodology [12, 13, 16]. The fact that concept maps consist of shapes and drawings has aroused higher interest in the students than the delivery of the lesson directly by the teacher and has enhanced student achievement.

Other studies [30, 31] show that Turkish grammar instruction in Turkey has not fulfilled its goals to the required level. One of the reasons for this situation is the fact that students could not develop a learning strategy concerning grammar instruction. Concept mapping has been found to be a beneficial technique in the instruction of grammatical topics either when they are drawn by the teacher or when they are drawn by students either on a group or individual basis. Concept maps which present inter-conceptual relationships in a meaningful and visual way contribute to the instruction of abstract concepts in grammar instruction. Within this context, it could be said that teachers need to make use of techniques to stimulate intrinsic interest in the course other than by teacher-centred instructional delivery and concept mapping is a convenient technique for achieving that purpose.

The students of the private primary education school were found to be more successful than the state primary education school students. The higher student achievement in the private primary education school could be explained through the low number of students in the class.

The teaching of Turkish grammar lessons through a concept mapping strategy results in higher student participation. Students are asked to find the common properties of parts of speech proceeding by sample sentences through the discovery learning strategy in grammar lessons covered through concept mapping. Consequently, the definition of the part of speech concerned is given by revisiting the concept map. The fact that the lesson proceeds via a question and answer method maintains student interest and results in

higher participation. The results of the interviews, in which students have mentioned their motivation and participation in the lesson increased in the lessons which were covered through concept mapping technique, support the research finding. In research undertaken by Özbay [31], Turkish teachers mentioned the appropriacy of the method as the most important factor in sustaining student interest in the course). Concept mapping maintained student interest in the lesson and became influential in their motivation for the course through their visual appeal which consists of drawings and shapes.

Cognitive strategies are identified two other categories. One is cognitive strategies, which involve learners interacting and manipulating what is to be learned. Examples include replaying a word or phrase mentally to 'listen' to it again, outlining and summarizing what has been learned from reading or listening and using keywords. The other category is social/affective strategies where learners interact with other persons or 'use affective control to assist learning. This last strategy, cooperation, gives us a convenient bridge to cooperative learning. In cooperative learning, teachers teach students collaborative or social skills so that they can work together more effectively. Indeed, cooperation is not only a way of learning, but also a thema to communicated about and studied [32]. The concept mapping technique creates a discussion platform among students and contributes to cooperative learning.

In trying to determine the common properties of concepts proceeding from a discovery learning strategy through an inductive approach, it was also seen that the students engaged in discussion with each other. The teacher asks the students to find different examples in addition to the examples prepared beforehand and brought to the lesson while the lesson is being covered. In the meantime, the students are active discussing with each other. On the other hand, a discussion platform is activated, while the concept map is being drawn through the participation of the students and cooperative learning is generated. The research finding which shows that concept mapping develops students' skills of cooperative work [13] supports the findings of this study.

Concept maps which are used for assessment and evaluation increase the recall level of Turkish grammatical concepts. As for assessment and evaluation during the implementation, the endeavour for the generation of a common concept map by the drawing of three students about the previously studied 'parts of speech' was made. It was seen that the level of remembering is considerably high about the concepts concerning 'parts of speech' in the discussions among the students. The students were observed remembering Turkish grammatical concepts more easily through instruction with concept mapping in the video-recordings. Besides, the fact that students mentioned concept mapping as having contributed to permanence of learning in the results of the interviews supports these findings.

Those students having visual, auditory and kinaesthetic learning styles emphasised that concept mapping accorded with their learning styles in the research performed by Willits [33]. The students in our study approved the use of concept mapping both in their verbal courses (Social Studies, Religious Studies and Civics) and in their quantitative courses (Science and Mathematics).

In other research [34, 35] it was seen that course-books did not cover significant concepts as comprehensively as required and they were inadequate to denote inter-conceptual relationships, on the other hand, the concept maps in the course-books were quite influential in order to analyse the conceptual structure of concepts. It was determined that Turkish course-books in Turkey do not cover concept maps as much as required. Within this context, it could be said that Turkish course-books are required to include concept mapping in the sections which discuss grammatical topics.

On the other hand, more extensive research into the use of concept mapping technique in Turkish courses must be conducted in Turkish Language Teaching departments of education faculties. One way forward could be the use of computer-assisted concept map drawing software must be provided in the course of in-service training so that use of the technique becomes more wide-spread among teachers. Computer-assisted concept map drawing software such as *'Inspiration'* must be adapted into Turkish by computer programmers and their use at school in Turkey must be more common.

Studies based on the use of concept mapping could be conducted in different skill areas of Turkish (reading, listening/watching, writing and speaking) and in various grade levels of primary education. Furthermore, additional studies on the use of concept mapping for assessment and evaluation in Turkish grammar instruction should be undertaken.

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Appendix 1: The concept map concerning adverbs and drawn by the researcher (The map is preserved as in the original)
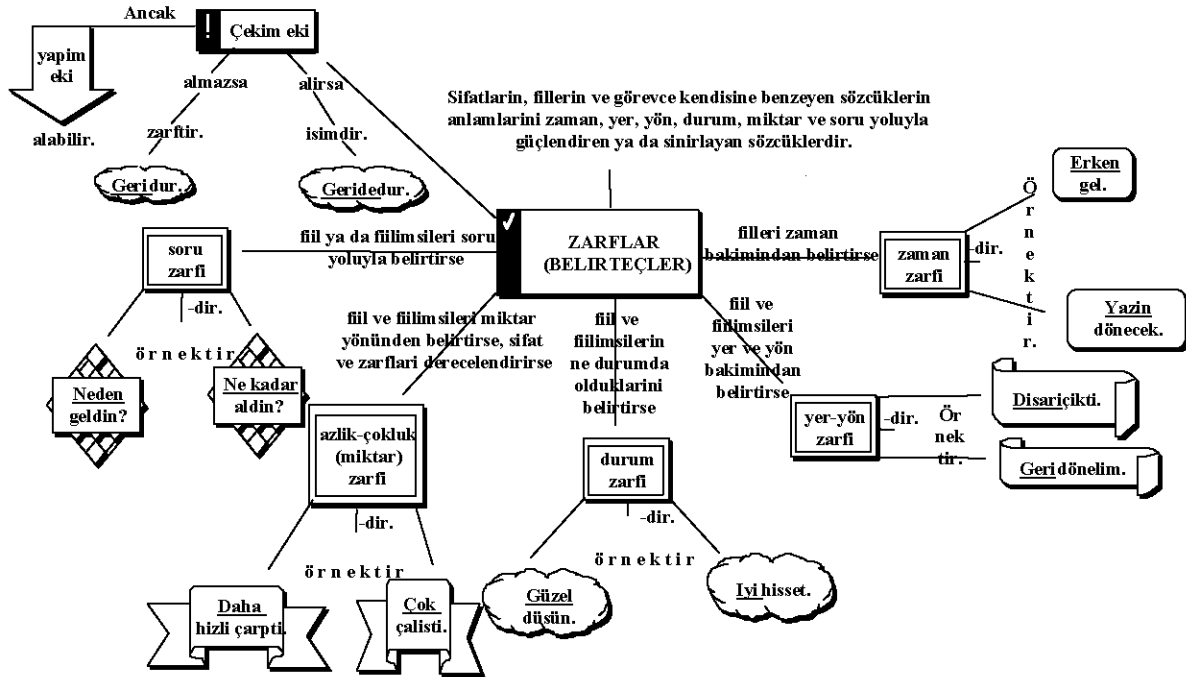
[2]The original text is in Turkish and this is a trnslation.