

The Effects of Graphic Organizers on Reading Comprehension Achievement of EFL Learners

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Abstract

Graphic organizers (GOs) are visual frameworks assisting students in the comprehension of a text. Studies in literature have mostly focused on L1 readers and there is a lack of empirical research about the instructional effects of GOs on L2 readers. The purpose of this research is to investigate the effects of GOs on reading comprehension achievement of EFL learners. An experimental design with a control group was used in the study. 50 intermediate level EFL learners in the preparatory classes of School of Foreign Languages at Dokuz Eylül University formed the group of participants for the study. The participants were given the Reading Comprehension Achievement Test before the treatment. GOs were studied with the experimental group in reading selected passages. The same reading materials were studied in the control group without the instruction of GOs. After a twelve-week treatment, both groups were given the Reading Comprehension Achievement Test again. After the statistical analysis, it was found that there was a significant difference in the reading comprehension achievement of the groups in favor of the experimental one. The results have revealed that the instruction of GOs in EFL reading courses helps learners in the comprehension of reading materials in English.

Key words: *Graphic organizers, reading comprehension, EFL learners.*

Grafik Örgütleyicilerin Yabancı Dil Olarak İngilizce Öğrenenlerin Okuduğunu Anlama Başarıları Üzerindeki Etkileri

Özet

Grafik örgütleyiciler bir metnin anlaşılmasını kolaylaştıran görsel şemalardır. Alanda yapılan çalışmaların genellikle ana dil okurları üzerinde yoğunlaştığı ve grafik örgütleyicilerin yabancı dilde okuma eğitimi üzerinde etkilerini araştıran deneysel çalışmaların eksik olduğu görülmektedir. Bu araştırmanın amacı grafik örgütleyicilerin yabancı dilde okuduğunu anlama başarıları üzerindeki etkilerini belirlemektir. Çalışmada kontrol gruplu deneysel desen kullanılmıştır. Dokuz Eylül Üniversitesi, Yabancı Diller Yüksekokulu'nda İngilizce hazırlık eğitimini sürdüren, orta düzey İngilizce bilgisine sahip 50 öğrenci çalışmanın yürütüldüğü katılımcı grubunu oluşturmaktadır. Deneysel işlemde önce her iki gruba da Okuduğunu Anlama Başarı Testi verilmiştir. Deney grubunda seçilen okuma metinleri grafik örgütleyiciler yoluyla işlenmiş, sonrasında metinle ilgili sorular yanıtlanmıştır. Kontrol grubunda ise okuma yapılmış ve soru yanıtlama ile dersler tamamlanmıştır. 12 hafta süren deneysel işlemlerin ardından gruplara Okuduğunu Anlama Başarı Testi yeniden verilmiştir. Yapılan istatistiksel çözümlenmelerde deney grubunun kontrol grubundan daha yüksek bir sonuç aldığı ve her iki grup arasındaki farkın deney grubunun lehine istatistiksel olarak anlamlı olduğu saptanmıştır. Sonuç olarak, grafik örgütleyicilerin kullanımının öğretilmesinin yabancı dil olarak İngilizce öğretiminde okuduğunu anlama üzerinde etkilerinin olumlu olduğu görülmüştür.

Anahtar Sözcükler: *Grafik örgütleyiciler, okuduğunu anlama, yabancı dil olarak İngilizce öğrenenler.*

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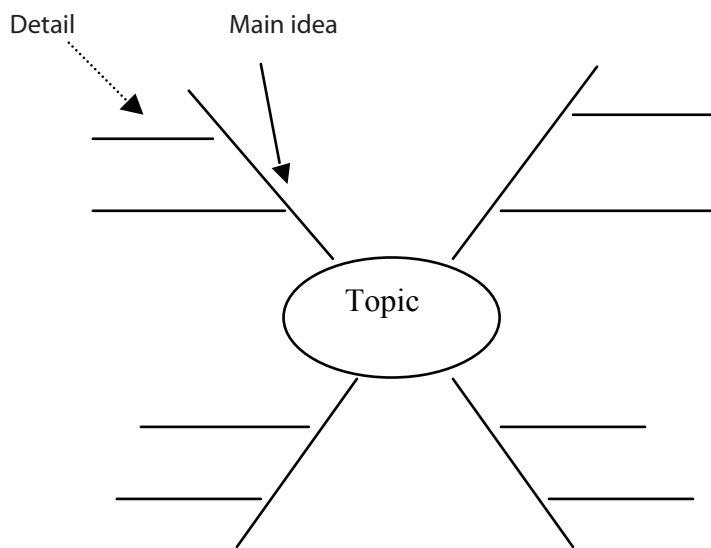
Introduction

A number of researchers have agreed that written texts have structures beyond sentences. These structures may be cause-effect, problem-solution, comparison-contrast or classifications. Seeing this structure helps the reader to comprehend the text correctly. Graphic organizers (GOs) are visual frameworks assisting in seeing structures of a text and thus help its comprehension. Jones, Pierce and Hunter (1988-1989: 20) simply defined the term graphic organizers as “visual illustrations of verbal statements”. A well-designed

graphic organizer reflects the main points in a text, their relations with each other, and help comprehension of the text holistically (Jones, Pierce & Hunter, 1988-1989).

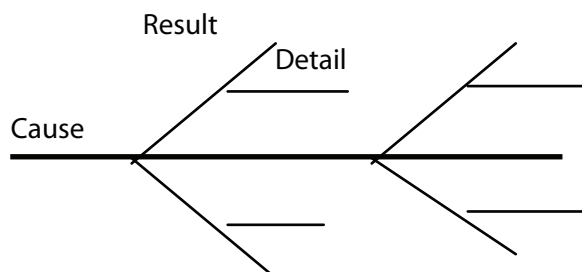
GOs can be generic or specific. They can be versatile so that they can be used for similar text structures. However, some of them do not work with some texts. They can also be presented in many shapes and sizes (Grabe & Stoller, 2001). The most commonly used GOs are shown in Figures below:

Spider maps are for the texts that describe a topic.



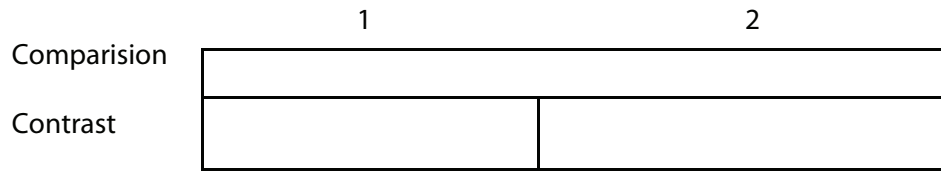
Fishbones are mostly used to show cause and effect relationship.

Figure 1: Spider map



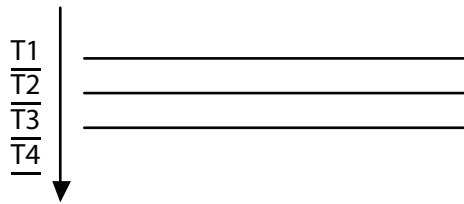
Comparison and contrast type of GO shows the similarities and differences.

Figure 2: Fishbone



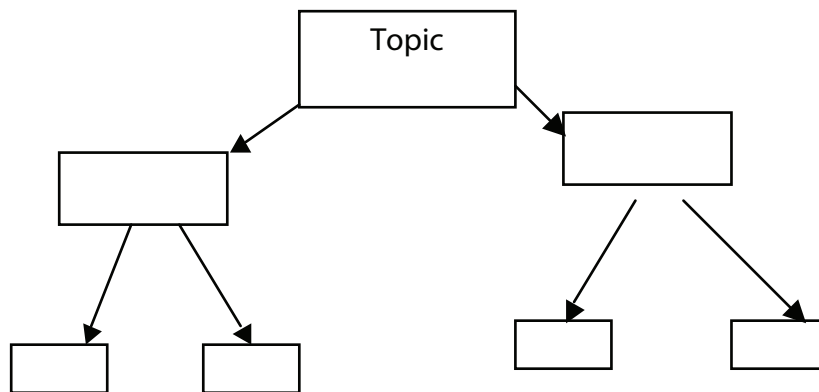
Continuum GO is used for structures showing time lines.

Figure 3. Comparison and contrast



Network trees may show a hierachy, branching procedures, classification, causes of a fact.

Figure 4: Continuum



Problem and solution GO are used to represent a problem and solutions in attempts to solve that problem.

Figure 5: Network tree

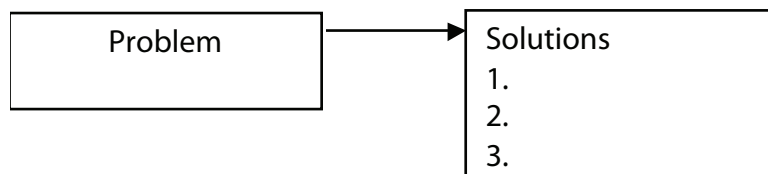


Figure 6: Problem and solution

The visuals above are adopted from Jiang and Grabe (2007), Kang (2004), and from the website <http://www.ncrel.org/sdrs/areas/issues/students/learning/lr1grorg.htm>. There are other GOs such as series of events chain, cycle, human interaction outline, venn diagram, and storyboard. The teacher should read the text carefully and decide on the best GO that represents the structure. Doing this with students using think-aloud activities may also help students to improve their reading comprehension.

While constructing a GO for a text, the learners go through it and find the title, sub-titles, illustrations and summaries. Then s/he starts to ask her/himself questions like these: "Are concepts presented in a hierarchy? Does the text suggest a timeline of information? Does the author compare and contrast two or more concepts? Is the text an explanation of something? What signal words are apparent?" (Jones, Pierce, & Hunter, 1988-1989:25). These questions lead the learner to choose the most appropriate graphic presentation of the text such as compare and contrast matrix, spider map, and process and sequence. The student then decides on what is important in the text and how the ideas are related. S/he decides on the most appropriate GO. S/he reads the text again and complete the GO. Finally, s/he revises it to check if there is any missing information (Jones, Pierce, & Hunter, 1988-1989). As Grabe and Stoller (2002: 221) mentions "it is worthwhile to train students to use simple graphics through a series of exercises that will move them from teacher-generated graphics, to teacher-guided student graphics and finally to student-generated graphics". As Grabe (1997: 10) states "getting students to produce useful visual representations of text structure is not an easy undertaking and requires considerable practice". Therefore, teachers should plan instruction of GOs very carefully to achieve the best results.

Teacher guidance and clear instruction help learners to form GOs and thus comprehend a reading text. Jones, Pierce, and Hunter (1988-1989) explains the steps in instruction process. First, the teacher should present a good example of a completed graphic outline which is similar to the type of GO that s/he is going to teach. Second, s/he should model how to

construct a GO. While doing this, the decision making process should be discussed clearly. Providing procedural knowledge is the third step. Students are informed about why they should use that type of GO and conceive their responsibilities in their own learning process. Fourth step is coaching students. Here, students work in as a whole class and then in smaller groups. They discuss about their GOs and see each other's work. Feedback of the teacher is crucial here. Finally, students should be allowed to outline their GOs individually. Following these steps, students are supposed to overview a reading material and choose the best fit GO to present the main points in a given text individually.

Merkley and Jefferies (2000-2001) suggested some points to be taken into consideration for effective instruction of GOs. Teachers should verbalize links between the concepts represented by the GO. They should let students participate in the process. In addition, connecting new learnings with prior learning is important to understand text structure. Any opportunities should be utilized to reinforce analysis of texts. In order to achieve these points, teachers should know what steps a learner takes while constructing GOs.

GOs can be used before, during or after reading. Robinson et al. (2003) found that presenting GOs before the text would be optimal in directing learners' attention to the links in the text. In another study by Spiegel and Barufaldi (as cited in Jiang and Grabe, 2007) it was reported that when the students themselves constructed GOs for the text structures, they retained information better. Alvermann (1981) stated that the GOs were effective when readers had to reorganize information in the text. These findings show that GOs may be used in all phases of reading process.

There are some other attempts to improve text comprehension during reading process. Using outlines is one of them. "An outline is a systematic listing of a concept with its subordinate concepts and their attribute values" (Robinson & Kiewra, 1995: 455). Although outlines are easy to construct and a good way of organizing information, they may complicate comprehension of relations among concepts in a written text. Outlines may

discourage learners to integrate information. However, GOs may help to overcome this difficulty as they provide associating concepts with each other (Robinson & Kiewra, 1995). In their research Robinson and Kiewra (1995) who studied with university students enrolled in an undergraduate educational psychology course concluded that the students in their experimental group who studied texts with the help of GOs, learnt hierarchical and coordinate relations better than the students in the outline group. Participants of their study also stated that GOs are more reader friendly than outlines.

Pan (2005) examined the effects of the implication of schema theory, metacognition and graphic organizers in English reading comprehension. The training for the experimental group lasted for 4 months and the data was collected by reading comprehension tests and checklists of effective English reading strategies to identify the participants' preference of using strategies. According to the results, the participants in the experimental group had better scores in reading comprehension tests and they had better abilities to use effective reading strategies. It was also reported that GOs could be used to introduce important vocabulary in a text and clarify confusing points while reading a difficult text.

GOs can be used in instruction of any reading texts. Alagozlu (2011), for instance, suggested that the instruction of GOs may help to integrate literature in EFL classes. She stated that they are appropriate especially for teaching short stories as they enable learners to see different points such as characters and events in a story. She also suggested using GOs as a post reading activity so that learners can recall the information in the text. It was also underlined that use of GOs promoted critical thinking skills of students.

Robinson, Corliss, Bush, Bena, and Tomberlin (2006) tried to find out if GOs help students perform better on tests of text comprehension. The participants of their study were the students enrolled in an educational psychology course at the University of Texas. The results of their experimental study showed that students who used GOs in text comprehension scored higher in examinations

and quizzes that covered course content. They also concluded that "the GO may help teach students not only course content but also important metacognitive skills, such as identifying text structure" (Robinson et al., 2006: 110).

Teaching text structure facilitates reading comprehension. Carrell (1985) found in her experimental study that teaching text structure can facilitate ESL students' reading comprehension. Another important finding of her study was that students' reaction to the training about text structure was positive and all the participants in the experimental group became more confident ESL readers. As GOs help readers to overview the structure of a text, it may be assumed that GOs help learners to gain more confidence in reading in English.

The instruction of GOs seems to affect not only confidence but also attitudes of learners towards reading in English. Mede (2010) studied with 54 intermediate level EFL learners found that after instruction of GOs, learners' attitudes towards reading in English were affected positively. The participants of the study reported that they enjoyed reading in English as they learnt how to approach the texts and it was easier for them to remember the key points after reading instead of dealing with trivial information. Another important result of the study was that the clear and well-designed instruction of GOs helped the learners to overcome difficulties in the use of GOs. It was concluded in the study that clear guidance and instruction assisted learners in application of GOs.

The research about GOs are mostly carried out with L1 readers and those carried out with L2 readers have investigated the effects of GOs with the combination of instructing other reading strategies. In other words, there is an apparent lack of research to show if GOs serve the comprehension of reading materials by themselves, without the combination of other reading strategies. As Jiang and Grabe (2007) emphasized there was a need for empirical research which involved extended instructional training. The aim of this research was to investigate the effects of instruction of GOs on reading comprehension of EFL learners.

Methodology

As the aim of the study was to determine the effects of instruction of GOs on reading comprehension of EFL learners, an experimental design with a control group was used in this study. This was a quantitative research type. The groups were recruited by a coin flip.

Participants

50 intermediate level EFL learners enrolled in one-year preparatory program of School of Foreign Languages at Dokuz Eylul University in İzmir, Turkey participated in the study. Table 1 shows the number of the participants in each group:

Table 1. The number of participants according to their groups and genders

Groups	Total number	Female	Male
Experimental	25	15	10
Control	25	14	11
Total number	50	29	22

Table 1 displays the numbers of participants in each group with their genders. There were 25 participants in each group. There were 15 females and 10 males in the experimental group. There were 14 females and 11 males in the experimental group.

Instruments

A reading comprehension test which was developed by the researcher was used to determine the reading comprehension achievement of the participants. There were 26 multiple choice questions in the test which was pre-piloted in 276 students from the School of Foreign Languages at Dokuz Eylül University in 2007. The KR 20 Reliability of the test was calculated as 0.77, indicating that the test had a satisfactory level of reliability. The test was also reviewed by experts in curricula and English language teaching to ascertain validity.

Procedure

The study was conducted in 2010-2011 academic year. First of all, the study groups were chosen by random sampling. Then, both groups were given pre-tests. The students in the experimental group were given four hours training sessions on GOs. During these sessions, the participants were given information about the GOs and example practices were studied with the instructor. Spider maps, fishbones, comparison and contrast type of GOs, continuum, network

trees, problem and solution type of GOs, series of events chains, venn diagram, and story board were among the GOs presented in the experimental group. The control group studied the same reading material without the instruction of GOs. In the following 12 weeks the participants in the experimental group structured their own graphic organizers for reading texts studied in the class hour and presented them to their classmates in groups. Some of the graphic organizers were also presented by the students to the whole class by drawing on the board. Finally, reading comprehension questions were answered by the participants and checked by the instructor. In the control group, the reading texts were read by the participants and the comprehension questions were answered and checked by the instructor. After 12-week treatment, both groups were given the post-test. The data was statistically analyzed.

Findings

Statistical analyses were conducted to find out the results of the study. Firstly, the data from the pre-test, which was given to both groups before the instruction of GOs in the experimental group, was analyzed to statistically prove that there was no significant difference between the experimental group and the control group before the treatment. The results are shown in Table 2:

Table 2: t-test results showing the equality between groups after the pre-test

Groups	N	M	Sd	df	t
Experimental	25	9.44	2.86	-,96	,17
Control	25	10.40	3.69		

As it is shown in Table 2, there was no significant difference between the experimental group and the control group just before the treatment about GOs. The Mean of the control group was a little higher than the experimental group at the beginning, yet this difference

was not statistically significant. After 12-week treatment, the participants were given the reading comprehension achievement test again. The results of the post-test are shown in Table 3:

Table 3: t-test results between groups after the post-test

Groups	N	M	Sd	df	t
Experimental	25	18.89	2.35	6.88	0.034**
Control	25	12.00	4.30		

p<0.00

As it is shown in Table 3, the Mean for the experimental group was much higher than the Mean for the control group. This difference was statistically significant. 12-week treatment in the experimental group affected the reading comprehension achievement of the students in a positive way.

Discussion

This paper argues that the instruction GOs in EFL reading comprehension may effect the reading comprehension. The lack of empirical research about the use of GOs in reading in another language was the starting point for the study. The Mean scores of the control (10.40) and the experimental group (9.44) after the pre-test implication was statistically not significant. As Jiang and Grabe (2007) emphasized the need for a long time period instruction period for the use of GOs, the experimental procedure was planned for 12 weeks. After the treatment, the experimental group's score for the post-test was much higher than the control group's score. The Mean for the control group was calculated as 12.00 while the Mean for the experimental group was calculated as 18.89. This difference between groups was statistically significant. It can be concluded that the instruction of

GOs had a positive effect on the reading comprehension achievement of English language learners.

The findings of the research are consistent with the findings of Carrell (1985) who found that the instruction of GOs facilitated reading comprehension in ESL context. Robinson et al. (2006) who studied on increasing text comprehension reported that instruction of GOs helped note taking in courses. Their study, however, did not test reading achievement. The findings were limited with the help of GOs in teaching course content. Therefore, the findings of this study revealed that the instruction of GOs had positive effects of reading comprehension of English language learners.

Although the participants of the study were not given any questionnaires about their opinions related to the use of GOs, the researcher who was the instructor of the GOs at the same time, observed positive changes in the attitudes of the participants in the experimental group towards reading in English. Almost all of the participants in the experimental group expressed they had more confidence while reading in English. These observations are similar with the findings of Mede (2010) and

Carrell (1985). Some of the participants also said that they started to read better in L1, too. Therefore, it can be assumed that instruction of GOs helps reading not only in a foreign language but also in native language. This may result from the fact that GOs improve text comprehension and meta-cognitive skills of learners (Robinson et al, 2006).

Another important observation was that the participants in the experimental group came up with different GO shapes during the treatment. They were also very willing to share their GO with their classmates. The instruction of GOs encouraged the students to study cooperatively. Most of them reported that their exam scores started to be better than before.

Conclusion

The aim of this research was to find out the effects of the instruction of GOs on reading comprehension achievement of EFL learners. The findings of the study show that clear guidance and a long time period instruction

help to improve text comprehension and reading comprehension achievement. Reading is a complex process especially for those who read in a foreign language. EFL learner encounter several difficulties such as vocabulary, culture difference, and text structure while trying to comprehend a text. Use of GOs may be useful for foreign language readers to improve their text comprehension and be better readers. It is important, however, that the instruction of GOs should be planned carefully by the teacher.

A number of limitations should be stated related to this study. First of all, the sample of the study was formed by the intermediate level of English language learners. The same study may be conducted with the participation of language learners from different levels. Secondly, the data regarding the perceptions and opinions of the learners and the instructors may be collected using questionnaires or interviews. This data may help how to organize and plan the instruction of GOs.

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