



**THE EFFECTS OF USING ACTIVITIES BASED ON MULTIPLE
INTELLIGENCE THEORY ON 11TH GRADE STUDENTS'
LEARNING AND RETENTION OF ENGLISH VOCABULARY**

**11.SINIF ÖĞRENCİLERİNDE ÇOKLU ZEKA KURAMINA BAĞLI
AKTİVİTELERİN KULLANILMASININ KELİME ÖĞRENİMİ VE KALICILIĞI
ÜZERİNE ETKİLERİ**

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Abstract

This article reports a quasi-experimental quantitative study which investigated the effects of vocabulary teaching techniques based on Multiple Intelligence Theory on learning and retention of English vocabulary. For the study, two 11th grade classes were randomly assigned as the Experimental and the Control Group. Multiple Intelligence Inventory was applied to the Experimental Group to identify the learners' dominant intelligences and prepare classroom activities accordingly. Vocabulary test was applied to both the Experimental and the Control Group as a pre-test. The students in the Experimental Group learned vocabulary through activities based on Multiple Intelligence Theory, while the students in the Control Group learned by using traditional techniques. Both groups were post-tested at the end of the study. In order to determine the long-term retention, the vocabulary test was reapplied to both groups as a delayed post-test two weeks after the study. The data was analyzed through Analysis of Covariance (ANCOVA) by using SPSS 11. The results of the study suggest that Multiple Intelligence Theory-based activities have a significant effect on language learner comprehension and retention of English vocabulary.

Key Words: Multiple Intelligence Theory, Vocabulary Teaching, English Vocabulary, Long-term Retention

Özet

Bu makale, Çoklu Zekâ Kuramına bağlı öğretim yöntemlerinin kelime öğretimi üzerine etkisini araştıran yarı-deneysel bir çalışmayı sunmaktadır. Bu çalışma için, 11.sınıf seviyesindeki sınıflardan Deney ve Kontrol Grubu olarak rastlantısal bir şekilde iki grup oluşturulmuştur. Çalışmanın başında Deney Grubundaki öğrencilerin baskın zekâ türlerini tespit etmek ve Deney grubunda uygulanacak etkinlikleri belirlemek amacıyla Çoklu zekâ anketi uygulanmıştır. Her iki gruptaki öğrencilere de çalışmanın başında bir kelime testi ön-test olarak yapılmıştır. Deney grubundaki öğrencilere kelimeler Çoklu Zekâ kuramına bağlı etkinlikler ile öğretilirken, Kontrol Grubunda öğrencilere kelime öğrenimi geleneksel yöntemler kullanılarak yapılmıştır. Çalışmanın sonunda iki gruba da son-test uygulanmıştır. Uzun dönem kalıcılığı test etmek için de aynı kelime testi çalışmadan iki hafta sonra yeniden uygulanmıştır. Elde edilen veriler, SPSS programında Kovaryans Analizi (ANCOVA) kullanılarak analiz edilmiştir. Çalışmanın sonucu, Çoklu Zekâ Kuramına bağlı aktivitelerin kullanılmasının kelime öğreniminde ve uzun süreli kalıcılığında etkili olduğunu göstermektedir.

Anahtar Kelimeler: Çoklu Zekâ Kuramı, Kelime öğretimi, İngilizce Kelime bilgisi, Uzun süreli kalıcılık

INTRODUCTION

Multiple Intelligence Theory (MIT) introduced by Howard Gardner in 1983, has many implications for teaching and learning foreign languages. Gardner's model (1983), which is based on findings from both cognitive science (the study of the mind) and neuroscience (the study of the brain) treats intelligence as multifaceted. MI gained a wide acceptance in the field of education in a short time (Armstrong, 2000). "Theory of Multiple Intelligences" is a learner-centered approach which emphasizes the abilities/intelligences in each individual. According to Gardner (1983), there are at least eight distinct forms of human intelligence, Linguistic, Logical-Mathematical, Spatial, Bodily-Kinesthetic Musical, Interpersonal, Intrapersonal, and Naturalist Intelligence.

Verbal/Linguistic Intelligence involves perceiving or generating spoken or written language. It allows communication and sense-making through language. Logical/Mathematical Intelligence allows individuals to use abstract relations; this intelligence is characterized by

the effective use of numbers and logical thinking. Berman (1998) states that "Logical-Mathematical Intelligence enables us to perceive relationships and connections, to use abstract, symbolic thought, sequential reasoning skills, inductive and deductive thinking processes" (p.3). Visual/Spatial Intelligence involves perceiving and using visual or spatial information. Gardner (1993) notes that "Spatial problem solving is required for navigation and in the use of the notational system of maps. The visual arts also employ this intelligence in the use of space" (p.21). Bodily/Kinesthetic Intelligence allows an individual to use all or part of his/her body in a creative way and includes athletic, creative, fine, and gross motor movement. Berman (1993) claims that this intelligence "involves a sense of timing and the perfection of skills through mind-body union" (p.4). Musical Intelligence involves communicating, and understanding meanings made out of sound. According to Gardner (1993), "Certain parts of brain play important roles in perception and production of music" (p.17). Naturalist Intelligence involves the ability to understand the natural world (Gardner, 1999), allowing people to distinguish, classify, and use features of the environment. Interpersonal Intelligence involves the capacity to recognize and make distinctions among the feelings, beliefs, and intentions of other people, and "builds on a core of capacity to notice distinctions among others; in particular, contrasts in their moods, temperaments, motivations, and intentions" (Gardner 1993 p.23). Intrapersonal Intelligence enables individuals to understand themselves, and can be seen in therapists and poets. Gardner (1993) claims that individuals with this intelligence have "a viable and effective model of himself or herself" (p.25).

In terms of teaching English, MIT presents a wide variety of teaching strategies that can be implemented in the classroom to support existing ones. It assists teachers to expand their teaching repertoire to include a broader range of materials and techniques that will appeal to and meet the needs of a diverse range of learners, which is the principle in MIT. Education can be more effective when the individual is given a focus. As each person has distinct features, MIT can be helpful in teaching the same subject in different ways. The effects of MIT have been studied and found beneficial in language teaching by many researchers, such as Anderson, (1998); Geimer, Getz, Pochert, Pullam, (2000); Bulut, (2003); Servi, (2004); Erdir,

(2005); Karadeniz, (2006); Hamurlu, (2007); Temel, (2008). MIT may be able to provide a framework for teaching English vocabulary and for developing activities that reduce the repetitiveness of a traditional English class. It is possible to facilitate the learning and retention of vocabulary when the suitable activities are chosen for the students according to their intelligences. For instance, when the students have bodily/kinesthetic intelligence, physical activities which maximize involvement can be chosen, or if the interpersonal intelligence is dominant in the classroom, pair and group work activities can be applied. Thus, teachers can apply a range of activities based on the different intelligences of the students. These activities can help the students to learn and retain the vocabulary more easily.

This study examines the effects of vocabulary teaching techniques based on MIT on 11th grade students' learning and retention of English vocabulary. A quasi-experimental study was conducted to investigate whether an implementation of activities based on MIT improves 11th grade students' learning and retention of English vocabulary in the context of an Anatolian High School.

Significance of the study

Vocabulary has a vital role in the process of language learning but is frequently neglected, making the process of language learning more difficult. McCarthy (1990) states that without sufficient words to express a wide range of meanings, communication in a Second Language (L2) cannot happen in any meaningful way, even when students have learnt the grammar and pronunciation of the L2. Cook (1991) states that grammar enables the learners to use the overall patterns but vocabulary is needed to allow this knowledge to be put into practice. Rather than just focusing on word meaning, vocabulary knowledge helps students understand the relationship between words in a sentence. Wallace (1988) claims that learning a foreign language is also a matter of learning the vocabulary of that language. Wilkins (1974) states that "without grammar very little can be conveyed, without vocabulary nothing can be conveyed" (p.111). Thus, vocabulary teaching has a special place in language

teaching. Vocabulary has not been given sufficient importance in programs for teachers during much of the twentieth century, according to Allen (1983), who argues grammar has been given too much time in language classrooms, at the expense of vocabulary teaching. Celce-Murcia (1979) states that grammatical items are meaningless without words, and, correspondingly, words are not enough without grammatical items. Thus, the place of the vocabulary is as important as the place of grammar.

MIT may provide a good framework to teach English vocabulary since its effects on learning were studied widely with positive outcomes (Anderson, 1998; Bulut, 2003; Erdir, 2005; Geimer, Getz, Pochert, Pullam, 2000; Hamurlu, 2007; Karadeniz, 2006; Servi, 2004; Temel, 2008). Geimer, Getz, Pochert, Pullam (2000) studied improvement in student achievement in Language Arts through implementation of MI strategies. The students were taught through both MI-based activities and traditional language teaching techniques. The results of this study indicated that compared to traditional teaching techniques, MI-based techniques provided more successful results in terms of both grammar and reading comprehension. Anderson (1998) conducted an experimental study with 100 seventh and eighth grade Latino students aiming to improve the retention of foreign language vocabulary through MIT and Memory Enhancement Tools. The results indicated that using MI techniques in the learning and retention of vocabulary can be very helpful.

In Turkey, MIT has also been studied by different researchers. Temel (2008) explored the impact of activities based on the MIT on the success of first grade primary school students in English lessons. Hamurlu's study (2007) aimed to analyze the effects of the instruction based on MIT on the students' achievements in English classes, and the students' attitudes towards the English classes. At the end of the study, which he conducted with ninth grade students at a foreign language medium high school, he found that the instructions based on MIT increased students' achievement in English classes and had positive effects on the students' attitudes towards English.

Karadeniz (2006) studied the effects of MIT-based instruction on the English language achievement and the permanence of the learned knowledge of ninth grade students at an Anatolian high school. In the five week study, the researcher found a significant difference

between the Experimental Group and Control Group. The Experimental Group, taught through MI-based techniques, was more successful in achievement and retention of learned knowledge in English lessons. Bulut (2003) aimed to identify the advantages of applying MIT in teaching English as a foreign language to young learners. The intelligences of 71 fifth-grade students were identified at the beginning of the study. Then their English course book "Enjoy English 5" was evaluated to identify activities for each intelligence. As a result, Bulut (2003) claimed that MIT-based activities seemed to have a positive effect in English lessons.

Erdir (2005) aimed to find the benefits of MIT in terms of the effect of vocabulary teaching on improving reading and listening skills. The hypothesis of this study was that the group which learned vocabulary through MIT to improve their reading and listening skills would be more successful than the group which followed the traditional method. This study was carried out in the army academy with second year cadets. The applications lasted for four months, and the success rates between the two groups showed that MIT-based instruction was far more successful than the traditional methods. Similarly, Servi (2004) studied the relationship between learning and teaching of vocabulary and MI, comparing vocabulary teaching which took into account MI with that which did not. The results indicated that taking into account MIT has positive effects on students' learning vocabulary.

Sarar (2008) aimed to overcome the difficulties of reading in a foreign language through MIT. The aim of this study was to see if MI activities when incorporated into reading classes would help learners to become better readers. The results of the study indicated that the use of MI activities in the reading classes enhanced learners' reading skills. Sarar concluded that MI activities in a reading class considerably increases student success in reading class in terms comprehension and the use of vocabulary.

All these studies indicate that MIT may provide a framework for teaching English vocabulary and provide activities that bring variety into the otherwise repetitive, traditional English classes. It is possible that achievement and retention of vocabulary learning can be facilitated by suitable activities chosen according to the students' intelligences.

RESEARCH METHOD

Research Design

In this study, Quasi-Experimental non-equivalent control group design was used (Karasar, 1991). Quasi-experimental designs are commonly employed in the evaluation of educational programs when random assignment of subjects to groups is not possible or practical. Since the classes were already formed, it was not possible to assign individual students to groups, instead intact classes were randomly assigned as Control and Experimental Groups.

Participants

There were 49 participants, - all 11th grade students at an Anatolian High School in Afyon. These students were enrolled the Anatolian High Schools after passing the Nationwide High Schools Entrance examination. Since Anatolian High Schools give importance to teaching foreign languages, these students were all well-motivated. There were 23 students in one class majoring in Social Science, and 26 in another majoring in Science and Math. The researcher randomly assigned the Social class as the Control Group and Science and Math class as the Experimental Group. Both groups were at upper-intermediate proficiency level.

Data collection instruments

In this study, Data Collection Instruments were "Multiple Intelligence Inventory" and "Vocabulary Test".

"Multiple Intelligence Inventory" consisted of 8 sections. Logical/Mathematical Intelligence, Bodily/Kinesthetic Intelligence, Visual/Spatial Intelligence, Interpersonal Intelligence, Intrapersonal Intelligence, Musical Intelligence, Naturalist Intelligence. There were ten statements representing intelligences. Students answered each item by choosing strongly agree, agree or disagree for each statement. An example item for Verbal/Linguistic Intelligence was "I read something almost every day that isn't related to my schoolwork"

The "Vocabulary Test", prepared by the researcher, was used to assess the students' vocabulary knowledge before and after the study. At the beginning of the study, 50 multiple choice questions were prepared. The test was revised after seeking expert opinion on the validity of the instrument, and it was then applied to 11th grade students, who were not part of the original study, to test reliability. Reliability analysis of the instrument revealed Kuder - Richardson 20 (K-R 20) coefficients of 0.71. After eliminating the problematic items, the reliability raised to KR -20 coefficients of 0.73, which was considered acceptable for this study.

Procedure

In this study, two intact classrooms at the same proficiency level (upper intermediate) were chosen randomly. One class was randomly assigned as an Experimental Group and the other one as Control Group. A Multiple Intelligence Inventory was applied to Experimental Group. The results of the inventory revealed the most dominant intelligences in the class to be Musical, Bodily- Kinesthetic and Linguistic Intelligences. Therefore, activities based on MIT were prepared accordingly for vocabulary teaching in the Experimental Group.

This study was carried out for two hours for each week over a period of four weeks. In the Control Group, the words were taught using traditional teaching techniques, and, using MIT- based activities in the Experimental Group. In both Groups, the Reading Texts were taken from the students' course book New Bridge to Success 4, which is at upper intermediate level. The topics of the chosen Reading Texts were Seasons, Eskimos, Natural Disasters and Global Warming.

In the Experimental Group, the topic of the first lesson was "Seasons". For this lesson, the students were expected to learn vocabulary items such as cycles, annual, flow, drop, recognize, foretell, tend, appreciate, bloom, and prospect. The teacher followed the following stages:

Stage one is concerned with awakening the intelligence through multisensory experiences, such as touching, smelling, tasting, seeing, so that learners can be sensitized to the many-faceted properties of objects and events in the world that surrounds them. At this stage, colorful pictures, newspaper articles, and posters were used to gain the attention of the students, and to appeal to different senses.

Stage two consists of amplifying the intelligence. At this stage, the teacher asked for volunteers to describe a season or a weather condition by using different words and to find the season or the weather condition that another student had just described. Then, worksheets were distributed and students were asked to write the appropriate word for the season or weather condition under each picture.

Stage three involves teaching with / for the intelligence. At this stage the intelligence was linked to the focus of the class via worksheets, small-group projects, and discussion. At this stage, the teacher explained the aim of the lesson and read the passage using body language, and various tones of voice to hold the attention of the students. After that, the students completed the information gap activity and the teacher and the students played a guessing game.

Stage four is the transfer of the Intelligence. Students reflect on the learning experiences of the previous three stages and relate these to the issues and challenges in the real world (Richards& Rodgers, 2001). Students were asked to reflect on both the content of the lesson and its operational procedures. In this final stage, the teacher gave students homework which involved describing a season or weather condition, either in group or individually.

In the Control Group, the same lesson was taught by using traditional drilling techniques. The class was mainly teacher-centered. First, the teacher read the passage and the students underlined the unknown words. Then, the teacher explained these unknown words. After the students wrote the list of new words and their meanings, they repeated the pronunciation of the words after the teacher. Data was collected in three stages: Before the instruction, immediately after, and two weeks after the instruction.

Before the instruction, the Multiple Intelligence Inventory was applied to Experimental Group, and the Vocabulary test was applied both to the Experimental and the Control Group as a Pre-test. Immediately after the instruction, the Vocabulary test was applied to the both groups as a Post-test. Two weeks after the instruction, the Vocabulary test was applied as a Delayed Post – test.

Data Analysis

In order to analyze the quantitative data, SPSS 11.0 was used. Descriptive Statistics and Analysis of covariance (ANCOVA) were conducted. Descriptive Statistics were used to obtain the Mean scores and the Standard Deviation of the Pre-Test, Post-Test and Delayed Post-test. ANCOVA was used to examine the differences in the mean values of the dependent variables that are related to the effect of the controlled independent variables while taking into account the influence of the uncontrolled independent variables (Fraenkel & Wallen, 2000).

RESULTS

This study aimed to find out whether there was a significant difference between traditional teaching methods and MIT-based activities in vocabulary learning and retention. There were three research questions:

Research Question 1

Does vocabulary teaching through traditional techniques contribute positively to the 11th grade students' achievement and retention of English vocabulary learning

Table 1.Pre-Test and Post-Test Results of the Control Group

	N	M	SD
Pre- Test	23	10.48	4.220
Post –Test	23	12.96	4.139
Delayed Post –Test	23	11.17	4.158

The mean score of the control group was 10.48 out of 40 questions at the end of the Pre-test. The mean score in post – test of the control group was 12.96 out of 40. Before the instruction, students in Control Group were able to correctly answer 10 questions out of 40. After the instruction, this rose to approximately 13. Two weeks after the instruction, when the vocabulary test was applied for retention, this score fell to 11. It can be said that vocabulary teaching through traditional techniques did not greatly contribute to the 11th grade students' achievement and retention of English vocabulary learning.

Research Question 2

Does vocabulary teaching through activities based on Multiple Intelligence theory contribute positively to the 11th grade students' achievement and retention of English vocabulary learning?

Table 2.Pre-Test and Post-Test Results of the Experimental Group

	N	M	SD
Pre- Test	26	13.46	5.368
Post –Test	26	29.73	4.754
Delayed Post –Test	26	28.08	4.640

The mean score of the experimental group was 13.46 out of 40 before the study; after the study it rised to 29.73 in the post test. Before the instruction, students in Experimental Group correctly answered 13 questions out of 40. After the instruction, based on activities designed according to MIT, 29 out of 40 questions were answered correctly. Two weeks after the study, when the vocabulary test was applied for retention, 28 questions out of 40 were answered. The result of the study indicates that vocabulary teaching through activities based on MIT contributed positively to the 11th grade students' achievement and retention of English vocabulary learning.

Research Question 3

Is there a significant difference between the high school 11th grade students who received instructions based on MIT and who received traditional instruction in terms of their achievement and retention of English vocabulary?

Table 3. Analysis of Covariance of MI Vocabulary Achievement

Source	Type III Sum of Squares	Df	Mean Score	F	Sig.
Corrected Model	642,820a	2	321,410	48,829	,000
Intercept	739,549	1	739,549	64,280	,000
Covariate	43,066	1	43,066	1,591	,213
Treatment	181,762	1	2181,762	30,621	,000
Error	244,854	46	27,062		
Total	425,000	49			
Corrected Total	3887,673	48			

When the results of ANCOVA (Analysis of Covariance), shown in Table 3, were evaluated, it was observed that there was a statistically significant difference between the Post-test scores of the Control and Experimental Groups. The Experimental Group learnt vocabulary more effectively compared to the Control Group. This indicates that activities based on MIT are more helpful for students' English vocabulary learning than traditional vocabulary teaching activities.

Table 4. Analysis of Covariance of Vocabulary Retention

Source	Type III Sum of Squares	Df	Mean Score	F	Sig.
Corrected Model	3464,604	2	1732,302	87,433	,000
Covariate	30,676	1	30,676	1,548	,220
Treatment	2946,339	1	2946,339	148,708	,000
Error	911,396	46	19,813		
Total	27785,000	49			
Corrected Total	4376,000	48			

In order to assess the difference between Control and Experimental Groups in terms of long-term retention of the vocabulary, the researchers conducted ANCOVA again. At Control Group, the mean score of retention – test was 11.17 out of 40; while for the Experimental Group, the mean was 28.08 out of 40. As can be seen in Table 4, there was a statistically significant difference between the mean scores of Control and Experimental Groups in terms of vocabulary retention. Two weeks after the study, the Experimental Group retained more vocabulary than the Control Group.

DISCUSSION

This study compared traditional vocabulary teaching and MIT-based vocabulary teaching. At the end of the study, when the results were compared, it was observed that activities based on MIT had a positive effect on vocabulary teaching. When the post-test mean scores of the students in Experimental Group and Control Group were compared, the mean score of the Experimental Group was significantly higher than the Control Group. The increase in the Experimental Group's mean score over the pre-test mean scores was fifteen. When the Delayed Post-test was applied, the mean scores of the Experimental Group showed that this Group retained more vocabulary than the Control Group. When the traditional vocabulary teaching methods were used, the gains were much less, with no significant increase in the mean scores. On the whole, after achievement and retention scores were analyzed significant differences were found between the mean scores of the students who received traditional instruction, and those who received instruction based on MIT. These 11th grade students learned and retained more vocabulary when they were taught through MIT-based-activities. These results are consistent with the results of previous studies which indicated that MIT based-activities had positive effect on students' learning (e.g. Anderson, 1998; Bulut, 2003; Erdir, 2005; Geimer, Getz, Pochert, Pullam, 2000; Hamurlu, 2007; Karadeniz, 2006; Servi, 2004; Temel, 2008). For instance, Karadeniz (2006) also conducted an experimental study in an Anatolian High school and found that MIT-based activities significantly increased learners' knowledge and retention of that knowledge like the present study.

The results of this quasi-experimental study carried out in an Anatolian High School confirm that MIT-based vocabulary teaching increase the achievement and retention level of the students. Not only it is more effective than traditional vocabulary teaching in the initial stages, but it also helps students to retain the words for longer. This success suggests that MIT-based activities are helpful in teaching vocabulary and need to be used widely in language classrooms. Activities based on learners' intelligences appeal to students' individual needs and they can hold the attention of the students. However, it may not be easy for a teacher to apply these activities in a very crowded classroom with a variety of different intelligences. The teacher need to have a thorough knowledge of MIT to assess her

learners' intelligences and apply appropriate activities so that the learners can enjoy, learn and retain what they have learned for a long time. Pre-service and In-service teacher education programs may put more emphasis to MIT and related activities.

It is possible to use MIT-based activities to teach four skills and grammar in addition to teaching vocabulary. Further studies can be conducted to explore the effect of MIT-based activities on teaching four skills and grammar. This study is conducted with 11th grade students in an Anatolian High School; therefore the results of the study are limited to this age group. The results cannot be generalized to other schools and age groups. Further studies can be conducted to study the effects of MIT-based activities in different age groups at different schools.

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