TECHNOLOGY AND CONTENT INTEGRATION IN LANGUAGE CLASSES IN A VOCATIONAL HIGH SCHOOL

EBRU ATADİL KUZUCU

BOĞAZİÇİ UNIVERSITY

2018

TECHNOLOGY AND CONTENT INTEGRATION IN LANGUAGE CLASSES IN A VOCATIONAL HIGH SCHOOL

Thesis submitted to the

Institute for Graduate Studies in Social Sciences

in partial fulfillment of the requirements for the degree of

Master of Arts

in

Educational Technology

by

Ebru Atadil Kuzucu

Boğaziçi University

2018

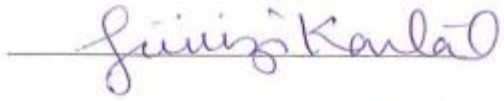
Technology and Content Integration

in Language Classes in a Vocational High School

The thesis of Ebru Atadil Kuzucu

has been approved by:

Assist. Prof. Günizi Kartal
(Thesis Advisor)



Assist. Prof. Şebnem Yalçın



Assist. Prof. Yavuz Samur
(External Member)



May 2018

DECLARATION OF ORIGINALITY

I, Ebru Atadil Kuzucu, certify that

- I am the sole author of this thesis and that I have fully acknowledged and documented in my thesis all sources of ideas and words, including digital resources, which have been produced or published by another person or institution;
- this thesis contains no material that has been submitted or accepted for a degree or diploma in any other educational institution;
- this is a true copy of the thesis approved by my advisor and thesis committee at Boğaziçi University, including final revisions required by them.



Signature……

Date ..June..08, 2018……

ABSTRACT

Technology and Content Integration

in Language Classes in a Vocational High School

This exploratory study investigates the effectiveness of technology and content integration in a foreign language class on students' content and language mastery in a vocational high school. The study was carried out in a real classroom setting with an experimental and a control group (n=36). The experimental group followed a syllabus with technology and content integrated materials designed by the researcher whereas the control group used regular textbook-based instruction. Interactive e-books equipped with scaffolds were designed and developed by the researcher based on scaffolding design guidelines for educational software. Technology integration was planned thematically around a unit from the English language curriculum, and content-based activities were employed with educational mobile applications, such as augmented reality, and web-based applications, such as digital storytelling. The language achievement was evaluated with a unit exam and a language test while the content knowledge was measured with content tests in English and in Turkish. The results showed that the experimental group significantly outperformed control group in content tests. Although the experimental group did not perform better than the control group in the language test, they outperformed the latter in the unit exam and in a writing task. Implications for research and practice are discussed and recommendations are offered for the teachers, researchers, and policy makers seeking solutions for the low foreign language achievement in vocational high schools.

ÖZET

Meslek Lisesindeki İngilizce Derslerinin

Teknoloji ve İçerik ile Bütünleştirilmesi

Bu çalışma teknoloji ve içerik ile bütünleşik yabancı dil derslerinin öğrencilerin içerik ve yabancı dil alanlarındaki başarısına etkisini araştırmaktadır. Yapı iskeleleriyle donatılmış beş adet etkileşimli elektronik kitap, teknolojiyi anlamlı bir şekilde bütünleştirmek amacıyla araştırmacı tarafından oluşturulmuştur. Ayrıca Quintana ve diğerleri (2004) tarafından önerilen yapı iskelesi oluşturma ilkeleri benimsenerek tasarlanan malzemelerin etkililiği de araştırılmıştır. Çalışma, bir deney ve kontrol grubunu oluşturan 36 katılımcıyla uygulanmıştır. Kontrol grubunda ders kitabı odaklı dersler işlenirken, deney grubunda araştırmacı tarafından oluşturulan teknoloji ve içerik ile bütünleşik yabancı dil malzemeleri kullanılmıştır. Yabancı dil başarısı ünite sınavı ve dil sınavı olmak üzere iki testle ölçülürken, içerik bilgisi Türkçe ve İngilizce içerik testleriyle ölçülmüştür. Veri analizleri deney grubunun içerik testlerinde kontrol grubunu anlamlı bir şekilde geçtiğini göstermektedir. Deney grubundaki öğrencilerin dil testinde kontrol grubundakilerden anlamlı bir şekilde daha üstün olmamasına rağmen ünite testinde ve tek ortak görev olan tarif yazma aktivitesinde daha iyi sonuçlar elde ettikleri gözlemlenmiştir. Bu tez, sonuçları literature dayandırarak tartıştıktan sonra, meslek liselerindeki düşük dil başarısına bir çözüm bulmak isteyen öğretmenler, araştırmacılar ve eğitimde karar verici rolünde olan kişilere öneriler barındırmaktadır.

ACKNOWLEDGEMENTS

I would first like to thank my thesis supervisor Assist. Prof. Günizi Kartal for the continuous guidance, support, patience and motivation throughout my master's study. She steered me in the right direction whenever I thought I needed it. I will always be grateful for her invaluable efforts and encouragement. I would also like to express my gratitude to my committee members, Assist. Prof. Şebnem Yalçın and Assist. Prof. Yavuz Samur for their insightful comments and suggestions.

My parents, Süreyya Atadil and Ceyhun Atadil, my spouse, Serdar Kuzucu, my brother, Emre Atadil, and my grandmother, Nefise Özcan, deserve the most sincere gratitude. They provided me unconditional support all the way. I would especially express my heartfelt thanks to my dearest spouse who is always behind me with great patience and endless support. I will always be grateful to him for being an irreplaceable part of my life.

I am grateful to all of my friends who were the real witnesses of my pain and joy. Selin Mavili, with whom I started this journey, encouraged me anytime I felt demotivated. I couldn't have dared to do this without her support and motivation. I must express my very profound gratitude to my dearest friends, Burçin Camcı, Selin Erkan and Buğrahan Memiş, for their unfailing support and continuous encouragement. This accomplishment wouldn't have been possible without any of them.

Last but not the least, I am also grateful to all my students who participated to my study with great effort and motivation. They will always be special for me.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION 1

1.1 Statement of the problem 2

1.2 Significance of the study 3

1.3 Purpose of the study 4

CHAPTER 2: LITERATURE REVIEW 5

2.1 Content-based instruction 5

2.2 Technology integrated language learning 17

2.3 Scaffolding for learning 23

2.4 English as a foreign language in the Turkish vocational high school context 27

2.5 Research questions 33

CHAPTER 3: METHODOLOGY 34

3.1 The design of the study 34

3.2 The design of technology and content integrated foreign language course 35

3.3 Implementation 42

3.4 Participants 43

3.5 Data collection 44

3.6 Data scoring 52

3.7 Data analysis 55

CHAPTER 4: FINDINGS 57
4.1 Language test 57
4.2 Unit exam 59
4.3 Content tests 60
4.4 Reflection questions 62
4.5 Feedback on the effectiveness of scaffolding features 65
4.6 Class work 66
CHAPTER 5: DISCUSSION 69
5.1 Limitations 76
5.2 Implications for further research and practice 77
APPENDIX A: UNIT EXAM 81
APPENDIX B: LANGUAGE TEST 83
APPENDIX C: CONTENT TEST IN TURKISH 84
APPENDIX D: CONTENT TEST IN ENGLISH 86
APPENDIX E: FEEDBACK SHEET ON SCAFFOLDING FEATURES 87
APPENDIX F: REFLECTION QUESTIONS 88
APPENDIX G: SYLLABI FOR EXPERIMENTAL AND CONTROL GROUPS . 90
APPENDIX H: WRITING RUBRIC 95
APPENDIX I: ORAL PRESENTATION RUBRIC 96
APPENDIX J: SPSS TEST RESULTS 97
APPENDIX K: AVERAGE SCORES 101
REFERENCES 105

LIST OF TABLES

Table 1. Number of students in each group 43

Table 2. Thematic Distribution of the Questions on Content Test 47

Table 3. Experimental Procedures 51

Table 4. Tests of Between-Subjects Effects in Repeated Measures ANOVA 57

Table 5. Tests of Within-Subjects Effects in Repeated Measures ANOVA 58

Table 6. Kruskall –Wallis H Test for Unit Exam 59

Table 7. Kruskal-Wallis H test results for Content Test in English 60

Table 8. The Results of One Way ANOVA on Content Test in Turkish 61

Table 9. The Results of ANOVA for Writing a Recipe Task 67

LIST OF APPENDIX TABLES

Table G1. Syllabus of Experimental Group 90
Table G2. Syllabus of Control Group 93
Table J1. Normality Tests before Data Transformation..... 97
Table J2. Normality Tests after Data Transformation 98
Table J3. Paired Samples T-test Statistics for the Parts of Language Test 98
Table J4. Wilcoxon Signed Rank Test Results of Experimental Group 99
Table J5. Paired Samples Test Results of the Unit Exam for Control Group 99
Table J6. Wilcoxon Signed Rank Test Results of Both Groups 99
Table J7. Independent Samples T-test results for Pre Content Test in Turkish..... 100
Table J8. T-test Results of the Content Test in Turkish for Groups 100
Table K1. Percentages of the Correct Answers on the E-books 101
Table K2. The Students' Scores on the Printed Concept Books..... 102
Table K3. The Students' Scores on The Online Concept Books-Storybird..... 103
Table K4. The Individual Scores of the Oral Presentation 104

LIST OF FIGURES

Figure 1. Cummins' language proficiency quadrant (1984) 9

Figure 2. Continuum for content integration into language teaching (Met, 1999) ... 10

Figure 3. Four zones of teaching and learning 26

Figure 4. Types of vocational and technical high schools in Turkey 28

Figure 5. Sample screen from one of the e-books 37

Figure 6. Examples of informative feedback from the e-books 41

Figure 7. Sample screenshot from the readings 42

Figure 8. The responses to the reflection questions (first time) 63

Figure 9. Responses given to the final reflection questions 64

Figure 10. Feedback on the effectiveness of scaffolding features 65

Figure 11. Percentage of correct responses students gave on the e-books 66

Figure 12. The mean scores of the comcept books and oral presentation 68

CHAPTER 1

INTRODUCTION

Today's learners are born into a world of the Internet and digital technology, and usually are more technologically savvy than their teachers. Teachers on the other hand, are expected to be competent not only in pedagogy and the content they teach but also in technology. What makes a good teacher is the ability to integrate these three pieces of knowledge (content, pedagogy and technology) skilfully in the service of learning and instruction. Technology integration can and does help learning to increase when done appropriately.

Technology integrated learning environments have become a need also because being born into a digital world have changed the ways in which students learn (Prensky, 2001). The foreign language classroom is one of the places where technology has been often used since the introduction of the personal computer into schools, because the advantages for learning were often obvious to the teachers, administrators, and students. Language learning requires authenticity, which can be provided through technology. Similarly, technology enables student-centered environment, which is a key component of language classes.

Content integration into language classes, such as in the Content-based Instruction (CBI) approach, which is one of the earliest approaches to language learning that promotes authentic contexts for language learning, enables this authenticity by integrating a meaningful content into the language courses. However, although technology has been perceived as an effective way to increase authenticity, there is not much research on technology and content integrated courses. This study is an attempt to help bridge this gap in the teaching and learning of language in

technology integrated meaningful contexts, by investigating the effectiveness of technology and content integration to the foreign language lessons on content mastery and language achievement,

1.1 Statement of the problem

Foreign language classes are supposed to be a place where all learners are engaged in meaningful language use in an anxiety-free environment (Crandall, 1993). However, it is highly probable that traditional textbook-based language lessons fail to achieve these conditions, since the focus of the class is generally on form rather than meaning. As for teaching a foreign language to the students studying at a vocational school, a handicap of disinterest towards language learning is likely to arise. One way to create an engaging learning environment is to integrate meaningful content to the language curriculum, which is achievable in content-based instruction (CBI) programs. However, it may be difficult to find common content for all learners in a classroom (Carrel & Carson; 1997). Working with a group of learners who share the same characteristics and interests, or work at the same workplace would overcome this problem, and therefore vocational schools seem ideal places to implement CBI. Although the Turkish Ministry of National Education (MONE) has designed Vocational English courses for some departments in vocational high schools, this approach has not been adopted for all departments in vocational schools. While technology makes it possible to offer a language learning environment where language is used a meaningful way to achieve a goal and thus increase motivation, (Chapelle & Jamieson, 2008), the integration of technology and content into language classes has been a relatively new phenomenon.

1.2 Significance of the study

In a content integrated language class, the students learn academic content in a language in which they are still learning. Content-based instruction (CBI) programs are intended to improve both language and content knowledge at the same time (Snow & Brinton, 1997). In discussions of CBI, many researchers have generally focused on describing successful CBI programs-mostly immersion programs- in case studies. Moreover, most of the research so far have analysed the effect of different CBI models on only language skills or content knowledge. Although teaching content through a second language has a long history, using a foreign language for content instruction is relatively new, and there is still need for research for conclusive results. (Lightbrown, 2014).

Chapelle and Jamieson (2008) stated, technology integration into this CBI class is a new concept, in which little research has done. Since the environment where the intervention took place had limited technological facilities and the participants had low English levels, a technology enhanced content-based instruction was provided based on scaffolding design guidelines proposed by Quintana, Reiser, Davis, Krajcik, Fretz, Duncan & Soloway (2004).

The vocational high school where the intervention in this study was carried out had limited technological facilities, and the participants' level English was low. Additionally, the studies in the CBI literature have focused on evaluating students' content knowledge in second or foreign language. There has not been extensive research measuring content knowledge in both mother and target language. The effects of such an implementation in such a limited context has not been studied before. In this study, technology and content integrated language materials were

designed for a meaningful two fold integration to enhance specific learning, and the effectiveness of these materials were evaluated accordingly.

1.3 Purpose of the study

The purpose of this study is to investigate the effects of technology and content integrated language instruction on vocational high school students' language achievement and domain-specific knowledge. Technology integration was designed based on the scaffolding design guidelines for educational software proposed by Quintana et al. (2004). Therefore, a second purpose of the study is to identify those design features that are perceived to be more beneficial by the learners who have limited English language skills.

CHAPTER 2

LITERATURE REVIEW

2.1 Content-based instruction

Teaching English in various regions of the world has been named English as a Second Language (ESL), English as a Foreign Language (EFL) or English as an Additional Language (EAL), based on the language context in which English is learned (Nayar, 1997). In Turkey, English is taught as a Foreign Language, which means that learners use English in order to communicate with other English speakers in the world (Harmer, 2012). Teaching English as a foreign language or a second language has evolved enormously from methods emphasizing accuracy to the ones that give priority to meaning and context by focusing on meaningful communication (Harmer, 2012). Content-based instruction is one of the methods which propose different levels of content integration to the second language or foreign language classes.

Content-based Instruction (CBI) is defined as "the total integration of language learning and content learning" (Stryker & Leaver, 1997:5). This method aims at creating meaningful academic context by putting language learning and content mastery together, and increasing the motivation to learn a new language (Snow, Met, & Genesee; 1989). Researchers favouring CBI believe that separating language from content and context results in inadequate instruction. CBI considers language learning as a whole. Language and content mastery are seen as a simultaneous process rather than a sequential action (Wesche & Skehan, 2002). Therefore, CBI assures learners to master their content and language skills at the same time.

The CBI approach to language teaching is in contrast with many traditional methods that favour isolation of language from content (Snow, Met, & Genesee; 1989). In this approach, content and language teachers cooperate and design the CBI curricula accordingly. Short (1991) proposes three essential components of a content-based language lesson, which are multiple authentic and interesting media, improvement in students' cognitive skills, and student-centered lesson. Therefore, putting language and content together in a lesson is not enough to call a course CBI. Both the language and content materials need to be chosen purposefully, and be modified in accordance with the students' proficiency levels in both areas.

Krashen's (1982) comprehensible input hypothesis provides a basis for CBI in second language education. He states that learners need to be exposed to comprehensible second language input in order to acquire a language, rather than to memorize vocabulary or grammar rules. Therefore, the more the learners are exposed to comprehensible input, the better the learning outcomes. One way to do this in ESL/EFL classes is teaching content in English. The integrated approach can increase understanding of the content matter, which results in better academic success and English proficiency (Short, 1991).

Another rationale for CBI lessons is that learners need to improve communicative competence, and in order to achieve this, there is a need to use target language productively. Swain (1985) proposed an output hypothesis, stating that comprehensible output, namely productive skills such as speaking and writing, is inevitable part of language learning. CBI offers learners a purposeful way of using language productively. Furthermore, output hypothesis focuses on the importance of giving contextually related language forms in a content area task. Similarly, CBI

courses, especially theme-based instruction emphasizes language structures relevant to the content.

Grabe and Stoller (1997) who claimed that three Vygotskian-based concepts are crucial in second language acquisition, which are Zone of Proximal Development, private speech, and student appropriation of learning tasks, argued that CBI classes include all of these notions. Since the complexity level in content-based classrooms increases day by day, the learners are supposed to extend their knowledge accordingly. At this point, private speech helps learners to self-regulate the thoughts. CBI classes provide learners many opportunities for private speech in the interaction of a more knowledgeable person. Finally, students in CBI lessons learn both from their teachers and peers by appropriating content, and activities related to the content.

The Cognitive Academic Language Learning Approach (CALLA) provides another solid base for CBI. CALLA is designed for limited English proficient students who take part in mainstream content instruction of upper elementary and secondary levels (Chamot & O'Malley, 1986). The aim is to develop academic language skills with the help of CBI. Suggested content areas for CALLA are science, mathematics, and social studies. An important component of CALLA is to teach learners necessary learning strategies which have potential to increase autonomy in learning. As an implementation of CBI, CALLA provides purposeful content to integrate both strategy learning and language learning (Grabe & Stoller, 1997). CALLA was applied in Italian Secondary schools by Sorani and Tamponi (1992). The collaborative work of content and language teachers resulted in a course program including various topics and content areas such as art, literature, science. In this approach, both the content topic and the related language skills are developed with necessary learning strategies provided in specific activities. Therefore, in

addition to the content and language tasks, learning strategies activities were included in the curricula.

Genesee (1994) claimed that teaching needed to be established on the already existing schemata. In order for a learning experience to be meaningful, learners need to link previous experiences with it. In that sense, one of the aims of integrating language into a meaningful content in CBI courses is to activate existing knowledge and build the new learning on it. Hence content provides a firm basis for the activation of existing knowledge.

Moreover, meaningful communication can be established with both form and meaning (content) working together, which are both crucial in learning, and cannot be separated (Grabe & Stoller, 1997). Rather than isolating language from content, CBI integrates the language form with a meaningful content. Similarly, Alptekin, Erçetin and Bayyurt (2007) stated that one of the possible reasons for the success of CBI is the focus on meaning rather than form. When language itself is the medium for understanding the content, students actively compose meaning, which gives them a practical purpose to learn the language. Additionally, it increases their motivation. Crandall (1993) also stated that the main focus of L2 instruction should be on meaning rather than form, which is achievable with a meaningful content and language modifications done in CBI.

Cummins (1984) proposed a quadrant with two dimensions for analysing language tasks (Figure 1). The first dimension is the cognitive demand attributed to a language task. Each task is classified as cognitively demanding or cognitively undemanding in accordance with the level of mental processes. Cognitively demanding tasks require higher mental demand, such as synthesizing information, whereas cognitively undemanding ones need lower mental processes, such as

comprehension. The level of cognitive demand is related to internal and external factors. Internal factors can be exemplified as the background knowledge of the learner. When the learners do not have enough background knowledge the task is likely to be perceived as cognitively demanding. On the other hand, external factors are the issues not related to the learners themselves. CBI favours cognitively demanding tasks in order to improve higher thinking skills. The second dimension, which is also related to the cognitive demand, is the context-embedded and context-reduced aspects of language proficiency. Context-embedded tasks contains contextual clues and paralinguistic elements which are useful in interpersonal conversation. In contrast, context-reduced tasks deal with the abstract and formal aspects of the language. Therefore, teachers need to choose tasks appropriate for the learners.

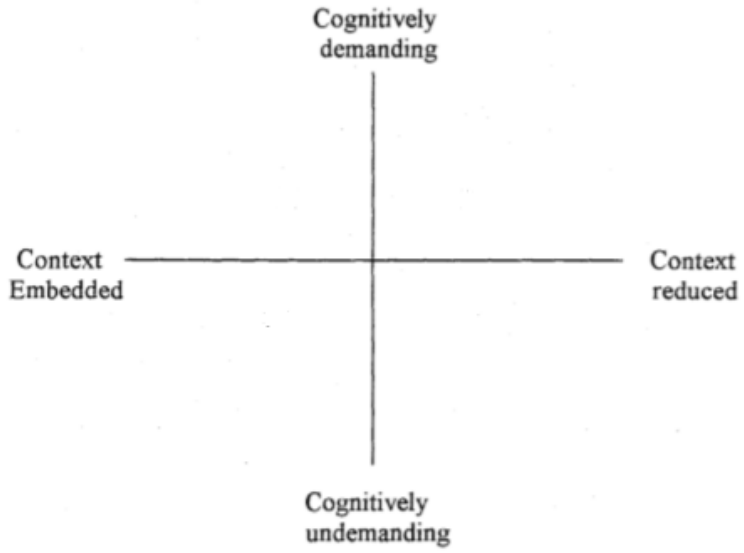


Figure 1. Cummins' language proficiency quadrant (1984)

Bereiter and Scardamalia (1993)'s theory of expertise provides another rationale for CBI. Expertise is the extent of solving complex problems that present a

challenge. For learners to be expert-like, they need to participate in complex activities, and by overcoming these challenges the learner gains expertise and thus intrinsic motivation is increased. Eventually, this gives rise to accomplishing knowledge building goals rather than task completion goals. An expert-like learner wants to realize the connections between the information sets, which helps them to be good learners. Integrating content into language is a way to gain expertise for the learners, who are exposed to increased but manageable task complexity. CBI provides coherent and meaningful content to achieve this complexity and expertise (Grabe & Stoller, 1997).

All CBI programs comprise the integration of content and language. However, to which degree this integration takes place may differ in various CBI models. Met (1999) proposed a continuum for the level of integration promoted by CBI models (Figure 2). The programs closer to the content-driven side of the continuum give greater importance to the content taught in L2 or a foreign language. However, in language-driven courses, content is used as a tool to teach the second or foreign language. It is the teacher's duty to decide which model to follow in accordance with content and language objectives.

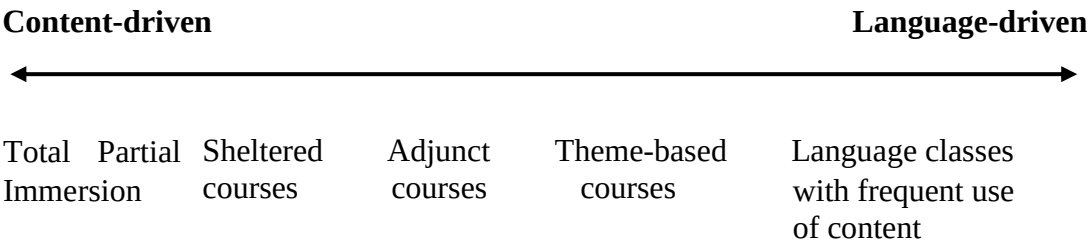


Figure 2. Continuum for content integration into language teaching (Met, 1999)

In sum, CBI is a holistic approach which does not separate content and language. Both formal and daily interpersonal communication aspects of the

language are taught within a meaningful content. Additionally, language is used as a medium of learning and communication, not as a lesson topic. Therefore, language is considered as a whole which cannot be broken into pieces. The language and content objectives are selected in accordance with the learners' need and levels, which increases learners' motivation for learning the target language.

2.1.1 CBI models

The idea of integrating language and content dates back to 1970s. The Foreign Language across the Curriculum (FLAC) programs which started in England in 1975 is considered as one of the earliest applications of CBI (Stryker & Leaver, 1997). FLAC has been implemented in many universities in the United States, as well. This movement emphasizes the use of foreign language in order to develop research skills, and access primary sources in different courses and curricula. As Stryker and Leaver (1997) stated, this movement leads to a shift from "learning to read and write" to "reading and writing to learn".

Another antecedent of CBI is English for Specific Purposes (ESP) or Language for Specific Purpose (LSP) which is common in occupational settings or at the tertiary level. ESP is defined as "an approach to language teaching, course design and materials development in which all decisions as to context and methods are based on the learners' reasons for learning." (Hutchinson and Waters, 1987: 19). The assumption that all learners have different needs and interests which consist of an inevitable part of the motivation lead to the emergence of ESP (Hutchinson & Waters, 1987). The language learning goals are established according to the students' academic or vocational purposes (Celce-Murcia, Brinton, Snow & Bohlke, 2014).

The aim is to help learners to acquire necessary target language skills in the specific area.

Before designing a course, ESP practitioners conduct a needs analysis to determine the reasons why a group of students need to learn English and their academic goals. They examine the discourse in which the students will be working, which is called target situation analysis. With the help of these focused analyses, learners' specific interests and needs are discovered (Celce-Murcia, Brinton, Snow & Bohlke, 2014). Thus, these two analyses are the backbones of a successful ESP curriculum.

In order to explain the relationship between ESP and CBI, Master (1997) states that "ESP is simply a domain of ELT that makes substantial use of the CBI syllabus". Although they serve at different levels in language teaching, it is possible design a CBI syllabus within the framework of ESP. While CBI is ideal for homogeneous groups, ESP courses may be followed by students with different levels or ages. Moreover, ESP courses are designed for especially adult learners while CBI is appropriate for learners at all levels. The content that provides authentic materials and meets the learners' specific needs is used to teach language. In that sense, ESP is a cornerstone in the development of CBI.

The immersion programs, on the content-driven end of Met (1999)'s continuum are another milestone for CBI (see Fig. 2). The aim of the immersion model is to teach the target language incidentally while teaching the content matter. The target language is only a tool for teaching the subject matter. This approach is still popular in especially Canada and the United States.

All the movements mentioned above have contributed to the emergence of CBI and examples of various implementations can be seen in different contexts. Although the

main aim which is to integrate language and content remains the same, there are some variations in the practice of CBI. Sheltered instruction, Adjunct model and Theme-based instruction are three basic instructional models of CBI. Immersion Programs, English for Specific Purpose (ESP), The Cognitive Academic Language Learning Approach (CALLA) and Content and Language Integrated Learning (CLIL) are types of instructional models that share common roots with CBI. In accordance with the degree of content integration into language classes, different CBI models have been proposed.

Theme-based instruction is a more language-driven CBI model and requires a curricula which focuses on topics and themes relevant to the learners' academic, occupational, or cognitive needs (Stoller & Grabe, 1997). Various activities are implemented on the basis of the selected content, and thus, contextualized and meaningful instruction is achieved. The topics can be selected from different areas, or after choosing a general topic it can be divided into sub-topics. The language teacher does not have to be an expert in the content area. The main aim is to achieve target language proficiency rather than content mastery. An example of theme-based instruction was the Los Angeles Unified School District Transitional Program for English Development, where students in 5th and 7th grades took theme-based lessons about different topics, which provided authenticity (Brinton, Snow, & Wesche, 1989).

Stoller and Grabe (1997) proposed a framework for a successful theme-based lesson, which is called Six T's Approach. It is about selecting the appropriate material and designing a solid activity. The first T is *theme* which is the central opinions organizing the units. The second one, *topics*, refers to the subgroups of the theme. The third T is *texts* which are resources about the content, such as readings,

videos, maps. *Threads*, the fourth T, are the links creating coherence in the curriculum. The fifth T is for *tasks* which are the activities used in the lesson. The last T is *transitions* which refers to create linkages to enable coherence between topics and themes. After determining student needs and interests, this approach can be implemented in order to provide coherent theme-based instruction.

In a study with college students, Rodgers (2006) evaluated the effectiveness of a theme-based program, where an Italian geography CBI course was offered T that included topics such as physical and social geography of Italy. Discussions and activities about this content were conducted, and no grammar explanation was provided. The results showed an increase in the students' content knowledge as well as linguistic competency.

Another model based on CBI is a relatively new educational practice. Content and Language Integrated Learning (CLIL), which can be considered as a new term for CBI, is defined as "a dual-focused educational approach in which an additional language is used for learning and teaching of both content and language" (Coyle, Hood, & Marsh, 2010: 1). The instructional emphasis is not only on language but also on content. The goal of CLIL is to improve the competency in the target language and content by giving equal importance to both content and language learning and aims to achieve a pre-defined mastery level in content and language (Marsh, Mehisto, Wolff, & Frigols Martin, 2010). The instructional content is derived from a content subject rather than everyday life or target language culture, which can be the case in other content-based approaches (Marsh, 2012).

Coyle (2006) observed significant improvement in the students' linguistic competence in a UK secondary school where CLIL was applied. Similar findings were recorded by Seikkula-Leino (2007), who stated that CLIL classes provided

higher language proficiency than the traditional classes in Finland. Apart from linguistic competency, motivation is another issue that is developed positively in a CLIL course.

In sum, while meaningful content integration into the language classes is the main focus, several different CBI models have been offered with varying degrees of content and language integration. In accordance with the aim of the foreign language course and educational context, the degree of emphasis will differ from one model to the other.

2.1.2 CBI in the Turkish context

Although CBI was applied in Turkey in 1980s in some of the Anatolian High Schools, where the medium of instruction for selected courses is English, this approach has been recently adapted only in private schools that have a lot more hours of language instruction (Yalçın, 2013). There has not been much research on CBI based language teaching in Turkey.

Alptekin, Erçetin, and Bayyurt (2007) carried out a longitudinal study lasting 2 years in Turkey. Zero beginner 4th graders were chosen for exploring the effectiveness of theme-based instruction in English classes. While the experimental group followed a theme-based syllabus which had common content with science and social sciences, the control group was exposed to a grammar-focused syllabus suggested by the Turkish Ministry of Education. The students' language development scores were collected for 2 years and the Cambridge Young Learners English Test (YLE) was applied. The study yielded significant results in favour of the experimental group. The experimental group outperformed the control group in listening and reading-writing tests. Moreover, interviews with students showed that

the theme-based approach created positive attitudes towards language learning. In this study, integrating language and content resulted in effective foreign language learning. However, content learning was not measured.

Similarly, Kızıltan and Ersanlı (2007) examined the effect of theme-based classes on language development skills in English. The participants were 6th graders, and in order to integrate content compatible with students' interests, the researchers gave several theme options to the participants. Based on their responses, a theme-based course was designed. The results of an achievement test revealed that theme-based CBI courses was effective for young learners.

Yalçın (2012) conducted a study investigating the effects of content-based instruction at the tertiary level in Turkey. The participants from the department of Foreign Language Education were randomly assigned to experimental and control groups. CBI was integrated into follow-up sessions of a course which provided academic writing and speaking activities. The sessions were conducted two hours a week for 12 weeks. The integrated content consisted of readings about general subject of language and communication which was motivating for the students in the Foreign Language Education Department. Although both groups read the same texts, each group followed a different syllabus. While the control group were provided language focus activities, such as comprehension questions, the experimental group participated in activities related to content, such as discussions and jigsaw readings. The effects of CBI on both content and language learning were analysed, and the results showed that the experimental group outperformed the control group in both of the areas. Therefore, even though the CBI group did not focus on language per se, they did not fall behind the other group in language learning.

2.2 Technology integrated language learning

Extensive research has been conducted with various digital technologies in language classes, such as multimedia, hypermedia, CALL (Computer-Assisted Language Learning), CMC (Computer-mediated Communication) and Internet technologies (Bush & Terry, 1997). Although technological component in the classroom has been labelled distinctly as computer-assisted language learning, computer-based language learning, or computer-enhanced language learning, Evans (2011) believes that the definitions and the labels are arbitrary. Therefore, it is essential to focus on the potential use of these technologies rather than their classifications.

One of the prominent studies evaluating the impact of Information and Communication Technologies (ICT) on language learning is carried out by Harrison et al. (cited in Evans, 2011). Sixty schools in England were included in the research, and it was found out that the students using high-ICT outperformed the ones using low-ICT on the national tests on foreign language. Similarly, Passey et al. (cited in Evans, 2011) concluded that the use of computers increased the students' motivation for language learning. Another extensive study was conducted by Schacter (1999), which showed that computer integration into language teaching resulted in positive achievement gains. However, it was noted that the aim of technology use had to be clear so that it could be effective.

For technology integration to be successful, the focus of technology use needs to be defined accurately. Educators need to consider learning first and technology use only it serves learning objectives. According to Haley and Austin (2013), computers can be considered as a facilitator in foreign language learning. With the help of computer technologies, various communication and interaction patterns are easily

accessible to people all over the world. Similarly, computers provide learners with different kinds of media.

Another perspective into the use of technology in language learning is to examine its effect on teaching the four language skills. Technology has been used to teach reading and vocabulary extensively. In the study of Tozcu and Coady (2004), a group studying frequently used words in computers was compared with another group reading texts and answering reading comprehension question. The group with technology integration outperformed the one with regular vocabulary teaching in both vocabulary gain and reading comprehension tests. Therefore, they showed a remarkable effectiveness of computer assisted vocabulary instruction on both vocabulary and reading comprehension achievement. In a similar vein, Yoshii and Flaitz (2002) conducted a study with adult learners at intermediate language level in order to evaluate the effectiveness of different kind of annotation type on incidental vocabulary and they concluded that visual and verbal annotations provided better vocabulary acquisition. In order to develop vocabulary acquisition and reading comprehension strategies, dictionaries, hypertexts, and concordances were used (Horst, Cobb, & Nicolae, 2005). Another strategy for developing reading comprehension and vocabulary acquisition achievement is to make target vocabulary and grammar salient, which is a good way of directing the focus on the structure (Chun & Plass, 1996).

Technology use in writing instruction, which includes various components such as language structures and organization of ideas constitutes a crucial part of the research. Two important tools for technology use in writing instruction are blogs and wikis (Elola & Oskoz, 2011). While blogs aim at personal use, wikis enable collaborative writing. Blogs are perceived as a tool where learners are able to express

themselves in a creative way. Collaborative writing in wikis, on the other hand, learners improve both organizational and grammar aspects of the writing process (Elola & Oskoz, 2011).

In listening instruction, both audio and video are used in language classrooms. In that sense, CALL is a good way to improve participants' word recognition skills and reduce their anxiety levels (Chapelle & Jamieson, 2008). The integration of computers can make it easier to control the source of input, and thereby develop listening comprehension strategies. Brett (1997) found out that multimedia materials have a positive effect on participants' listening comprehension scores by making input more comprehensible with the help of visual and auditory sources.

As for speaking and pronunciation, Chapelle and Jamieson (2008) argued that CALL materials provide learners with a variety of accents, stress, and intonation. Another point to be considered is that one needs to automatize some words in order to speak fluently, which comes along with extensive practice. Computer technologies can enable the automatization of oral language.

To sum up, using technology in foreign language classes is not a new idea. Although the names assigned to the use of technology in language teaching have been changing rapidly, the underlying characteristics are common. The key point is that such technology integration must be designed and implemented appropriately, and aligned carefully with the needs of learners so that learning is enhanced.

2.2.1 Technology in content-based instruction

Although CBI has deep roots going back to 1970s, few studies have carried out to assess the effectiveness of technology integration on content-based courses (Chapelle

& Jamieson, 2008). There has been some research on ESP courses especially in teaching business English. However, ESP courses do not aim at assessing both content and language mastery as in CBI.

Brett (2000) designed a CALL software to teach business English and found out that participants appreciated learning Business English and the use of computer was perceived as an effective strategy to direct the focus on the most important objectives. In a similar vein, Erçetin (2011) developed Mobile Assisted Language Learning (MALL) materials used in a vocational English course for tourism vocational high school students in Turkey. Mobile technology was inserted to the course in the form of supplementary material, which included reading, listening, vocabulary, and grammar related components. The participants found the materials effective and enjoyable. Kasper (as in cited in Kasper, 2000) investigated the effects of internet use on a CBI course on environmental sciences. The results showed that the pass rates of this class and their levels of language proficiency were significantly higher than the other classes who followed a regular ESL curriculum.

To sum up, there has not been extensive research on technology integrated CBI courses. However, few studies on technology integrated ESP and CBI courses has made it clear that technology helps learners to increase not only their motivation but also language mastery.

2.2.2 Technology in the Turkish EFL classroom

In recent years, technology has been a crucial part of teaching the four skills. Writing instruction makes use of web 2.0 tools, especially in the form of blogs and wikis all over the world, and research was conducted to test its effects on learning outcomes. Blending writing classes with blogs create better writing performance (Bahçe &

Taşlacı, 2009; Şimşek, 2009, Arslan & Şahin-Kızıl, 2010), and better cultural understanding (Keranen & Bayyurt, 2006). Moreover, e-mail exchanges were found to be effective in improving vocabulary acquisition and usage, e-mail conventions and grammar (Sevingil, 2012).

In studies on the reading skills, web-based readings constitute emerging paths for recent research in Turkey. Hypermedia reading strategies were compared with strategies for printed texts, and Akyel and Erçetin (2009) detected no difference between these strategies. Sakar and Erçetin (2005) investigated the effects of hypermedia annotation on reading comprehension with university students taking English for Academic Purposes course, and found a negative correlation between annotation use such as pictures, pronunciation and videos, and reading comprehension. Moreover, visual annotations were preferred rather than the textual ones. Apart from the reading strategies and annotation types, the use of WebQuests in writing instruction yielded positive writing outcomes (Koçoğlu, 2010). Positive results were also obtained by Girgin (2011), who conducted a research in order to enhance vocabulary gain in a pre-intermediate level English course in Turkey. The participants were supposed to create their own website with target words in a web 2.0 tool. The researcher explained that students had positive feelings toward the integration of computer use with foreign language learning activity.

Computer-mediated communication tools are widely used in speaking and pronunciation instruction, and many studies have been conducted using these tools. However, the effects of synchronous computer-mediated communication on oral proficiency development is debatable. Seferoğlu (2007) investigated the effect of synchronous computer-mediated communication (SCMC) on oral proficiency which was assessed through the participants' five minute speech samples. However, neither

the group following SCMC nor the group in traditional classroom environment significantly differed in terms of oral proficiency development. On the other hand, Satar and Özdener (2008) examined the relationship between SCMC, and speaking proficiency and anxiety, as well. Although they detected an increase in speaking proficiency, a decrease in anxiety levels was observed. Another tool that has been used in teaching pronunciation is the mobile phone. Saran, Seferoğlu and Çağıltay (2009) revealed that mobile phones had positive effect on pronunciation, based on the results of pronunciation tests and interviews. Another technological tool for teaching pronunciation is accent reduction software. Seferoğlu (2005) stated that this program improved participants' pronunciation skills. As for listening instruction, the integration of software programs is common. Işık and Yılmaz (2011) compared a group following traditional classes with tape recorder to another where CALL listening activities were conducted, and found that CALL had a positive effect on the development of listening comprehension scores.

In addition to the studies that focus on teaching the four skills with the help of computers, research was conducted on the use of computers in language classes in Turkey in general, and how language instructors approach integration of computers into the daily classroom activities. The majority of the 97 foreign language teachers working at different private schools use computers to complement traditional classroom activities, and only a few have participated in formal training on the integration of computer technologies into language classes (Yıldız & Tatar, 2012). Another study with four English language teachers working at a primary or secondary schools, Koçoğlu (2012), found that they were not competent in computer skills, although most teachers had positive beliefs about the integration of computer technologies into classroom activities. In a similar vein, Asan (2003) conducted a

research with 252 elementary school teachers where the lack of technical knowledge and computer skills among teachers were observed. Additionally, although they were not enthusiastic about technology use, gender and teaching experience were found to play a crucial role in being familiar with the technology.

Although technology integration into the 4 skills instruction is not a new trend, there has not been extensive research on this topic. Moreover, most of the studies covering this area have been conducted with college level students. Another issue to be considered that these studies include the use of specific web 2.0 tools or technological tools on teaching the target skill.

2.3 Scaffolding for learning

Scaffolding design framework for instructional software provides the last theoretical basis of this study. Scaffolding is defined as "the process by which a teacher or more knowledgeable peer provides assistance that enables learners to succeed in problems that would otherwise be too difficult" (Quintana, Reiser, Davis, Krajcik, Fretz, Duncan, & Soloway, 2004, p.338). Although scaffolding is not a term used by Vygotsky, it is widely related to Zone of Proximal Development (ZPD) (Berk & Winsler, 1995). Vygotky (1978) defined ZPD as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving or in collaboration with more capable peers" (p.86). Therefore, both scaffolding and ZPD require a more knowledgeable person's or peer's help to move the learner one step beyond where they would have difficulty in achieving alone.

Berk and Winsler (1995) categorize the components of scaffolding into five. The first one is joint problem solving. Learners need to be engaged in a meaningful

and collaborative problem solving activity. The second part of a good scaffolding lies in intersubjectivity, which means that the learners share common understanding in the end although they have different perspectives at the beginning of the task. Another component is warmth and responsiveness of the peer or the instructor which comprises the emotional aspect of the interaction. One of the most crucial goal of scaffolding is to keep the learner in the ZPD which may be achieved through structuring the task and adjusting the level of knowledgeable person interaction. The last component of the scaffolding is to promote self-regulation which enables learners to control their own learning.

2.3.1 Scaffolding design guidelines for technology-based environments

In technology-based learning environments, the tool itself provides the needed scaffolding, rather than a more knowledgeable peer or teacher (Reiser, 2004). The aim of the support is more than accomplishing the task, with the help of scaffolding learners learn from the experience, as well.

Quintana et. al (2004) provides a scaffolding design framework within the area of science inquiry learning. Three main processes constitute the scaffolding design framework which are sense-making, process management, and articulation and reflection. Sense making involves basic activities of inquiry, such as creating hypotheses or analysing data. Possible challenges to be encountered at sense making level are the difficulty of constructing disciplinary formalism, domain-specific knowledge, and explicit expert strategies. In order to overcome these areas of difficulty, learners need to be supported with scaffolded tools. Representations and language to connect learner's understanding with the formalism of the field should be included in the tool's design, and structural organization should be aligned with

the requirements of the discipline. Another guideline to support sense making is to use representations where crucial aspects of the data or information may be explored in a different way.

The second component of science inquiry is process management, where learners need to make decisions about steps to follow for investigation. The obstacles in process management include lack of the knowledge about the most relevant action, strategic knowledge to organize the inquiry, and automatization of the less important chores. Ways to overcome these challenges are to provide learners a structure for difficult tasks, expert guidance about the process and to enable automatization of the routine tasks.

The last component is articulation and reflection, which include articulating arguments. The learners who may not think about articulating arguments, the ones who may want to achieve quick outcomes, and those who may have difficulty in planning their learning encounter difficulties in this step. Scaffolding is needed particularly for these learners. Scaffolded tools help learners by facilitating the articulation and reflection processes.

This study adopts some of these design guidelines described above. Even though these are formulated within the science inquiry perspective, Quintana's framework provide substantial design guidelines that are crucial for other areas of learning, such as reading online (e.g. Zhang & Quintana, 2012). Guidelines about sense making, process management and articulation and reflection were adopted in the design of the current study in order to support learners. The e-books created by the researcher followed the guidelines especially about sense making and process management. In order to foster articulation and reflection, students created their own story books with the help of a desktop application that provided similar scaffolding.

2.3.2 Scaffolding in language learning

Scaffolding is needed in foreign language learning as in other areas of learning. Mariani (1997) provides a quadrant for showing the relationship between scaffolding and the degree of challenge (Figure 3). This quadrant represents 4 kinds of environment, namely (1) high challenge, low support; (2) low challenge, low support; (3) low challenge, high support; and (4) high challenge, high support. According to the quadrant, if both support and the challenge is low, learners may be bored and would not want to follow the task. In a similar vein, when high challenge and low support are provided to the learners, they are likely to be frustrated, since it would be difficult to achieve the task without adequate scaffolding. The third option is the high support/ low challenge which is called comfort zone, where the learners quickly complete an easy task with lots of scaffolding. Although learners seem to experience success in this type of environment, meaningful learning occurs in a more challenging environment. The ideal learning environment is high challenge/ high support.

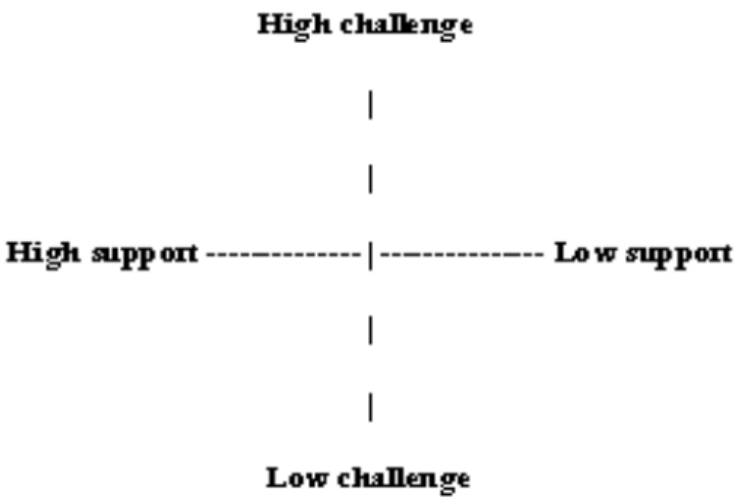


Figure 3. Four zones of teaching and learning

Source: [Mariani, 1997]

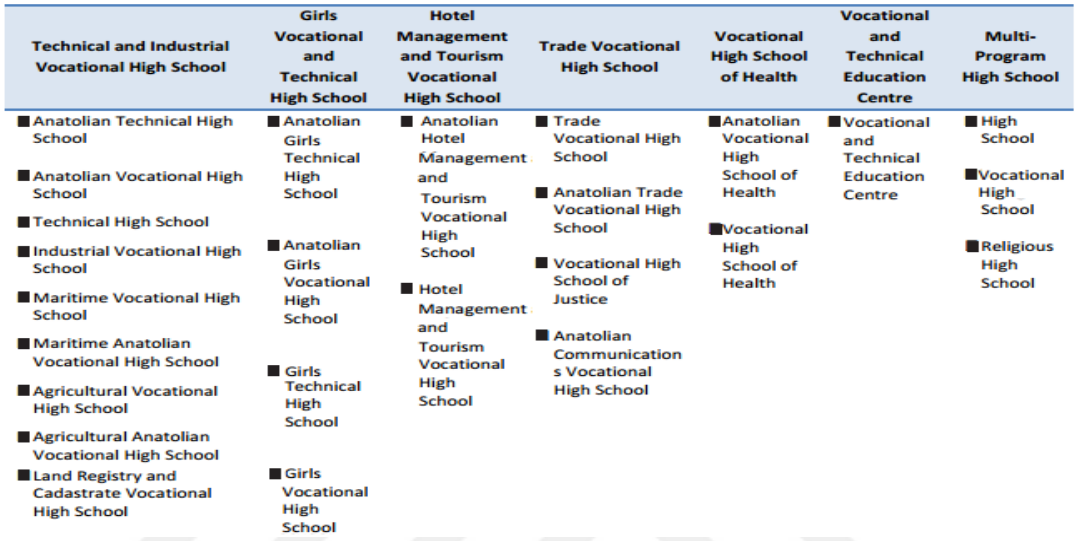
Gibbons (2002) states that high challenge/ high support learning environment is also ideal for language learners. If the task is challenging, and adequate scaffolding is provided, this environment will be the most beneficial to the learners. Instead of simplifying the task, learner should be provided with scaffolding when they are presented with a cognitively demanding task.

Fortune (2004) proposes scaffolding techniques for CBI classes based on the immersion teachers' opinions on the study carried out by Echevarria, Vogt, and Short (2004). He categorizes the activities including three types of scaffolding - verbal, procedural, and instructional scaffolding. Verbal scaffolds generally focus on language development activities such as paraphrasing, using synonyms and antonym or corrective feedback. On the other hand, procedural scaffolds include some grouping techniques such as jigsaw or role play. Moreover, instructional scaffolding allows learners to encounter tools supporting learning such as graphic organizers or visuals. CBI classes are supposed to be enriched with a variety of scaffolding techniques such as these in order to maintain an effective lesson.

2.4 English as a foreign language in the Turkish vocational high school context

According to the Vocational and Technical Education Strategy and Action Plan 2014 - 2018, vocational and technical secondary schools in Turkey aim at preparing students for higher education as well as a vocation, by providing necessary knowledge, skills, and competence in accordance with their abilities and interests. The implementation of vocational and technical education in Turkey takes multiple forms, as summarized Figure 4. These schools offer four year secondary education with various fields and branches. In the 9th grade, students are offered regular common education as in the other types of high schools and at the end of the 9th

grade, they are expected to choose a vocational area. 10th grade students continue with field education. In the 11th and 12th grades branch education is offered, where students determine a branch of the field in line with their interests. Additionally, 12th grade students need to complete an internship program three days a week.



Technical and Industrial Vocational High School	Girls Vocational and Technical High School	Hotel Management and Tourism Vocational High School	Trade Vocational High School	Vocational High School of Health	Vocational and Technical Education Centre	Multi-Program High School
■ Anatolian Technical High School ■ Anatolian Vocational High School ■ Technical High School ■ Industrial Vocational High School ■ Maritime Vocational High School ■ Maritime Anatolian Vocational High School ■ Agricultural Vocational High School ■ Agricultural Anatolian Vocational High School ■ Land Registry and Cadastrate Vocational High School	■ Anatolian Girls Technical High School ■ Anatolian Girls Vocational High School ■ Girls Technical High School ■ Girls Vocational High School	■ Anatolian Hotel Management and Tourism Vocational High School ■ Hotel Management and Tourism Vocational High School	■ Trade Vocational High School ■ Anatolian Trade Vocational High School ■ Vocational High School of Justice ■ Anatolian Communications Vocational High School	■ Anatolian Vocational High School of Health ■ Vocational High School of Health	■ Vocational and Technical Education Centre	■ High School ■ Vocational High School ■ Religious High School

Figure 4. Types of vocational and technical high schools in Turkey

Source: [Vocational and Technical Education Strategy and Action Plan, 2014 – 2018]

As stated in the Vocational and Technical Education Strategy and Action Plan (2014) which was published by the Ministry of National Education in Turkey, the students who have low academic success in the middle school generally prefer the Vocational and Technical High Schools. Therefore, the students in these high schools have the least success rates in the university entrance exams, and one of the aims of vocational and technical high schools which is to prepare students for college is likely not achieved.

When the other aim, to prepare individuals for the workplace is considered, a report on the state of the human resources in Turkey by Gür, et al. (2012) states that

companies tend to hire for certain positions employees who graduated from vocational and technical high schools rather than the general high school graduates since they have some technical background knowledge necessary for the job. However, these companies also mentioned that the graduates are not qualified enough and the quality of the education given in vocational and technical secondary schools need to be increased. Therefore, it can be inferred that these schools are not likely to provide necessary preparation for the workplace, either.

The report by Gür et al. (2012) highlights that another important need that must be addressed is the improvement of foreign language skills of vocational and technical school graduates. According to the results of a survey about the shortcomings of the workforce, which is an extension of the report, vocational and technical knowledge about the field is a profound deficiency, which is followed by experience, business ethics, and foreign language skills. Similarly, the Vocational and Technical Education Action Plan for the years 2014 – 2018 points out the need for the improvement of competency in English as a foreign language. The Ministry of National Education aims at increasing the quality of language teaching by making English courses more functional for vocational schools. Thus, analysing and improving foreign language curriculum in these schools is essential.

To understand why students in these schools are not competent enough in English, needs analysis research has been carried out in Turkey (Aydoğanlı, 2006; Canbay, 2006; Çelik, 2003; Diken, 2006; Sabuncuoğlu, 2010). An important result of these studies is that students want to learn Vocational English in line with their needs and interests (Sabuncuoğlu, 2010; Çelik, 2003; Diken, 2006). Vocational English courses are offered for some departments in vocational high schools like tourism and cooking (İgrek, 2013), however, not every vocational department have specially

designed English language courses. The present study bridges this gap by offering a theme-based course for child development students.

In a study carried out in a vocational high school, Aydoğanlı (2006) analysed the textbooks used in vocational high schools for teaching English as a foreign language. This analysis showed that the textbooks were not authentic and interesting enough; and necessary technological supplementary materials such as CDs were not included. It is recommended that the course books include more authentic and interesting materials enriched with proper visuals and technological support.

Sabuncuoğlu (2010) carried out a needs perception research with the participation of 453 students studying at 3 different vocational and multi programmed high schools from different parts of Turkey to find out whether or not the students thought being competent in English was necessary for them, and possible reasons for this. She revealed that students in vocational high schools believe that learning English in intermediate or advanced level will contribute enormously to their jobs. Moreover students said that they would be more willing to do activities about their own vocational field, but the current curriculum included only a general English course. As a solution to this problem, Sabuncuoğlu (2010) proposed the Content-based Instruction (CBI) framework with a component of English for Specific Purpose (ESP). However, the implementation of this approach in the vocational high school context was left for further research.

In a study of 196 students, 35 content course teachers and 32 former students, Çelik (2003) investigated the learners' academic and occupational English needs in a vocational college. The researcher asked questions about the vocational English course to current students, former students, the instructors and employers at office management and secretarial studies departments. Results showed that vocational

English courses need to include more reading and speaking activities especially about the students' specific fields. In addition, the importance of teaching both academic and vocational English were emphasized by the participants.

Canbay (2006) changes the focus from what students think they need to what content area instructors think the students need. Canbay (2006) expresses the need to develop a curriculum following Content-based Instruction approach in the prep class, and in order to do so, an analysis of the areas that need emphasis is essential for a successful curriculum. The content area instructors claimed that reading is the most crucial skill that needs to have a substantial part in the design of CBI courses. Especially reading texts related to students' content area is believed to be the most important component. Listening and translation were considered the next most important needs. The instructors emphasized translation both in general and in the students' vocational area. It seems that what was suggested in this study is a combination of CBI with ESP.

Another needs analysis research about the reasons of learning English was conducted by Diken (2006) with participants from the department of Tourism and Hotel Management in a vocational college. The participants claimed that they needed to learn English for both academic and occupational purposes. Because of the nature of their work, they needed to communicate in both formal and informal situations. For this reason, speaking and listening were the central demands in language learning. Moreover, they emphasized the importance of translating a passage about their content area. The participants focused on the necessity of learning communicational aspects of the language, rather than its grammatical form. Finally, the CBI and ESP approach in line with the departmental workplace requirements are suggested by the participants.

By taking into consideration the results of the needs analysis studies, İgrek (2013) designed a five week Vocational English course within the theme-based teaching model with 56 participants studying computer programming at a vocational college. The effects of the course on participants' academic success in reading and writing skills and content area knowledge related to their field were examined. The results of the content and language skill achievement tests revealed that the vocational English course designed within the principles of CBI was effective. Although the theme-based course had a positive effect on the students' writing achievement, content knowledge, and total achievement scores, no significant difference was found out in terms of the reading scores.

Another area covered in the literature on vocational high school EFL course is technology integration. Satar and Özdener (2008) investigated the effects of two synchronous computer-mediated communication (SCMC) tools which are text and voice chat on participants' speaking proficiency an anxiety levels. The results of the speaking test and anxiety scale revealed that both groups increased speaking proficiency levels, however, there was a decrease in the anxiety levels of the text chat group. Similarly, in the study of Erçetin (2011), as mentioned in above section, the findings revealed that participants developed positive attitudes towards technology use, and they found the materials enjoyable.

As it can be concluded from the studies discussed above, the design of the foreign language courses in vocational high schools need to take into consideration the students' both academic and vocational needs and interests. The textbooks and course syllabi should be prepared accordingly. A robust solution that addresses these issues would be to carefully design content-based courses with appropriate technology integration.

Notwithstanding the previous literature on the three basic aspects of this study, namely, CBI, technology integration, and scaffolding, there is still a need to explore the effectiveness of these three areas on language learning separately. In addition to that, combining all three of them in a research is supposed to be a relatively new area waiting to be discovered. This study tries to find out the effectiveness of technology integration on a CBI class enriched with scaffolds on content and language learning.

2.5 Research questions

The following are the research questions addressed in this study.

1. What is the effect of technology enhanced CBI design on:
    1a. content learning, as measured by the difference between pre and post test scores on a content knowledge test in English and in Turkish?
    1b. L2 gains in vocabulary and grammar, as measured by a unit exam and language test?
2. What are the students' perceptions on the effectiveness of interactive e-books based on the students' own evaluation and feedback?
3. Which components of the implementation are perceived as more motivating for learning by the participants?

CHAPTER 3

METHODOLOGY

This chapter presents the instructional design and data collection procedures of this study. First, it explains how technology and content are integrated into the foreign language classes and how a unit is implemented in the experimental group. Then participants and data collection measures are described. Finally, information about data scoring and analyses is included.

3.1 The design of the study

This is an exploratory study of technology and content integrated materials development for an English as a foreign language class. Learning materials were specifically designed for language objectives and the effectiveness of technology and content integration was evaluated based on learning outcomes in the content area and language proficiency. Two previously formed classrooms constituted the experimental and control groups of the study. The researcher was also the English teacher of these two classes.

Before the intervention, two pre-tests about content area, one in Turkish and one in English, were given, and two pre-tests about language achievement, a unit exam, and a language test, were conducted in both the experimental and control groups. One of the language pre-tests was designed in the same format as the exams the students regularly took as part of language assessment while the other language test included different question formats, such as odd one out, choose the correct one, and decide whether the sentence is grammatically correct or incorrect. Since it was an exploratory study carried out in a real classroom settings, all the tests were

designed in order to evaluate the effectiveness of technology and content integrated materials. Thus customized tests that specifically address the purpose of the current design were implemented instead of standardized ones.

The independent variable in the study was the type of English language instruction provided: technology and content integrated foreign language instruction in the experimental group, and regular classroom instruction in the control group. The dependent variables were language achievement in vocabulary and grammar for both groups, and content knowledge in child nutrition for the experimental group. While the experimental group followed technology and content integrated language syllabus, the control group followed the regular textbook. Although both groups covered common grammar topics and vocabulary, the researcher carried out different activities in each class in accordance with the type of instruction adopted. The only common task was to write a recipe, which was integrated to the theme of both the groups. While the control group was assigned to write a recipe without specifying anything, the experimental group wrote a healthy recipe for kids.

3.2 The design of technology and content integrated foreign language course

The researcher examined the curricula for Child Self-care, and English as a foreign language, mandated by the Ministry of Education for child development and care vocational area schools, and identified several units for designing technology enhanced CBI to be used with the experimental group. The criteria for selection were 1. the students were not already familiar with the content, and 2. the content was compatible with a unit in the EFL class in the 11th grade EFL curriculum for the spring semester. For the EFL class the unit entitled *Health and Nutrition* was selected from the book *Yes You Can A2.2*, mandated and distributed by the Ministry

of Education. A unit on Child Nutrition was selected from the course on Child Self-care from the 12th grade curriculum, to make sure that the students were not already knowledgeable about the content. Thus, the CBI lessons were designed by combining two units, one from regular English language curriculum and one from the content area course which the students would take the following year.

In order to have a deeper understanding of the content area, the researcher took online courses on child nutrition from *Udemy*, read the textbook used in the Child Self-care course at the school, and examined a textbook about the young child and nutrition written in English. In addition, the researcher worked with a content teacher specializing in child development while creating the syllabus and the content tests.

The grammatical structures and the target vocabulary covered in the EFL unit were identical in both the experimental and control groups, since the same EFL unit was covered in both. While the target structures and vocabulary were presented within the content of child nutrition in the experimental group, the control group followed the regular curriculum activities in the textbook.

3.2.1 The technology and content integrated language activities to support learning

The technology and content integrated materials designed specifically for integrating content with EFL instruction included five interactive e-books, an augmented reality activity, and digital story-telling, and paper-based story writing.

3.2.1.1 Interactive e-books

Five different interactive e-books were designed and developed by the researcher, based on the content of the vocational area, namely, child nutrition. A different topic

related to the child nutrition theme was covered each week, and each interactive e-book supplied content on the topic of the week using the target structure and vocabulary. The first interactive e-book set the stage for the story by introducing the characters. The four e-books that followed were about the adventures of the characters around the general theme of child nutrition.

A sample screen from one of the e-books is shown in Figure 5. These e-books were developed in *Articulate Storyline*, based on the scaffolding design framework proposed by Quintana, et al. (2004). In order to create interactivity, various question formats such as drag and drop, pick one, and pick many were used. The users were allowed multiple attempts for each question, and informative feedback was provided for both the correct or incorrect responses for scaffolding purposes. Thus technology was integrated meaningfully into the daily classroom use, and within a documented framework.



Figure 5. Sample screen from one of the e-books

Short (1991) states 3 important aspects of a content-based language lesson: multiple authentic media chosen within the students' interest, improvement in students' cognitive skills, and learner-centred lesson. The syllabus for the experimental group was designed in line with these 3 components. Authentic media such as children books about nutrition (*Charlie and Lola,* and *Jack and the Hungry Giant*) were chosen based on the participants' area of specialization, and were integrated with the e-books and classroom activities. For example, crucial points on these children books were included in the e-books, as well. Moreover, additional classroom activities such as creating an enjoyable plate for children after reading the book about Charlie and Lola were carried out. This authentic media was supposed to both reinforce learning and increase interest towards the topic. In order to improve the participants' cognitive skills, Short (1991) suggests to teach students critical thinking and study skills. Brainstorming, creative story writing and whole class discussions were included in the instructional design for this purpose. Finally, the activities designed for each lesson, especially group work, had the same common aim, to create a student-centred classroom environment.

The 6 Ts approach, which specifies six components of a theme-based curriculum was taken into consideration while designing the syllabus (Stoller & Grabe, 1997). *Texts, themes* and *topics* were selected from the vocational area in line with students' needs and interests, and *threads* and *transitions* were planned in order to enable coherency between *tasks*.

Haley and Austin (2013) state that computers have a facilitator role in L2 instruction by enabling different environments for communication and interaction, and by providing diverse multimedia. In addition to the e-books, which were specifically designed to address the learning needs of the participants, technology

was integrated into the other classroom activities to foster meaningful language learning. Creating a concept book for young children, video watching activities and playing an online game in the content area were technology-integrated learning activities used in this study.

3.2.1.2 Other technology integrated activities

A major objective of the content unit was to comprehend the parts of the food pyramid. During the implementation, each level of the pyramid was assigned to a group of the students and they created a huge pyramid in groups which was displayed on the wall of the classroom. In order to combine real world with virtual world experiences, a freely available Augmented Reality (AR) application, *Aurasma* was selected. All students downloaded and used *Aurasma,* which has been frequently used for educational purposes around the world (Baird, 2016). Students recorded short videos about the description of their own part of the food pyramid including appropriate vocabulary, and sent the videos to the teacher. The researcher embedded these videos to the food pyramid photo by using *Aurasma*. In the following lesson, the students placed their mobile phones over the food pyramid and started a virtual learning adventure by watching all of the videos about each part of the pyramid. At the end of the session, the students presented their part of the food pyramid, and these presentations were also integrated into the poster of food pyramid. In doing so, content mastery supported by technology was targeted.

Another activity in the technology-enhanced learning environment was to design a concept book in *Storybird.* The researcher signed up each students to the website and created an assignment for them to complete individually during class time. The researcher brought six laptops to the class for each lesson. As a preparatory

activity to this task, the students started to prepare a hard copy concept book in groups. Since there was only six computers in the classroom, they completed their assignments in turn. While six students were completing their concept books, other students were preparing a hard copy version of concept books in groups.

3.2.2 Design features inspired by scaffolding guidelines

Four of the five interactive e-books that the students completed were entitled *At the Supermarket 1, At the Supermarket 2, Ordering Food,* and *In the Kitchen,* and each covered content and vocabulary from the child nutrition chapter that the students would study the next semester. In addition, a fifth book was designed for the first day of the implementation to introduce the story and the characters. Since the students had low English proficiency and came from low socioeconomic families with few opportunities to support foreign language education, the e-books were enriched with scaffolds aiming to help them further. While designing these e-books, scaffolding guidelines proposed by Quintana et al. (2004) that are appropriate for language learning were adopted.

Reiser (2004) asserts that scaffolding is a crucial technique which provides students with support so that they can handle more complex tasks. Otherwise, accomplishing these tasks alone, without this critical support, would be much more difficult, if not impossible. Berk and Winsler (1995) states that scaffolding aims to keep the learners in their ZPD with the help of structuring the task. In that sense, scaffolding tools are useful in guiding students, and supporting their planning so that they can engage in the complexity of the tasks.

Quintana et al. (2004) categorized three types of scaffolding: sense making, process management, and articulation and reflection. In the present study, visual

conceptual organizers, such as the salient image of food pyramid on screen was employed in the reading to ensure the sense making process. Another component to facilitate sense making operations was informative feedback, given after learners selected which food to buy for a child, where scaffolding was provided by building on learners' background knowledge (see Figure 6). By enabling multiple representations of the food pyramid, learners had a chance to examine the concept deeply.

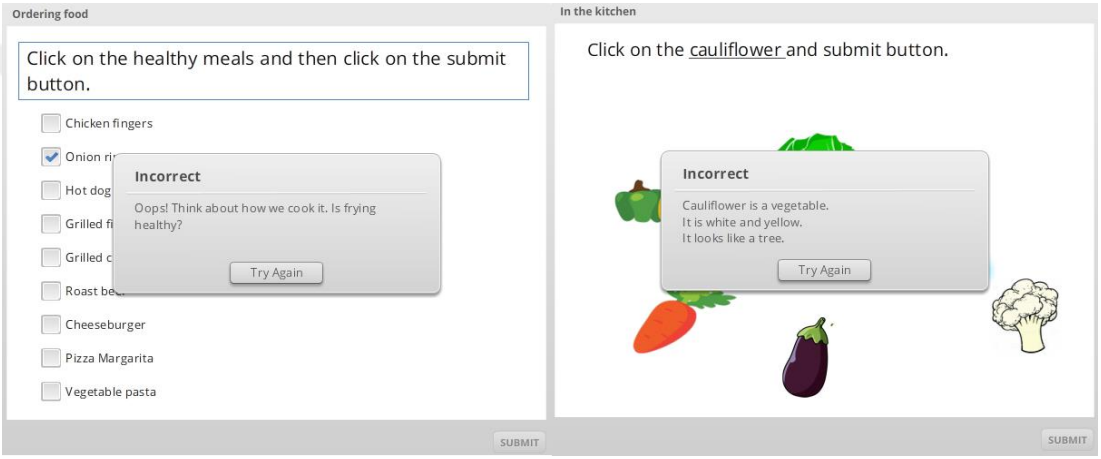


Figure 6. Examples of informative feedback from the e-books

In terms of process management, complex tasks were divided into smaller parts in all of the readings. For example, in the reading on *Ordering Food* the learners could see only the relevant part of the menu for a specific task, instead of the whole menu (see Figure 7). Similarly, ordered checklists were embedded in the stories to support learners to describe the complex task fully (see Figure 7). In addition, easy switch between the glossary and main content was provided to facilitate navigation within the tool.

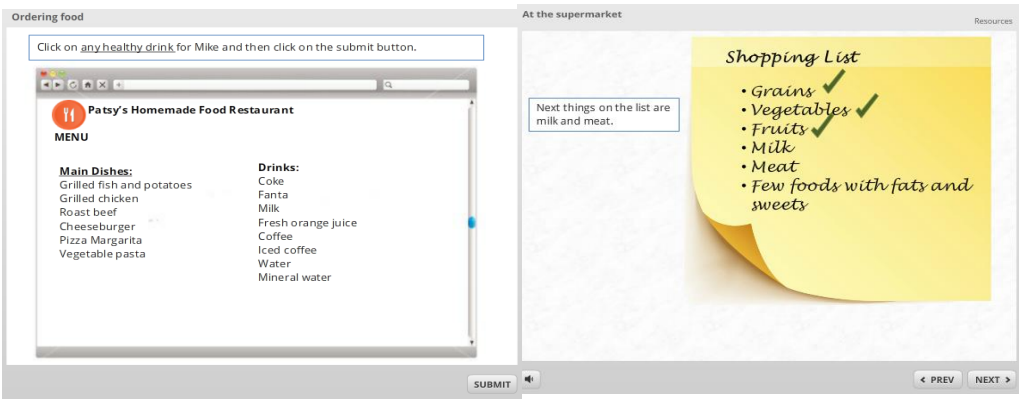


Figure 7. Sample screenshot from the readings

Finally, the third type of scaffolding, for articulation and reflection, was provided via *Storybird*, a desktop application that supports writing skills by providing visual and verbal prompts. After completing the five e-books on the computer, the students designed their own concept book in *Storybird*, intended to teach children about healthy and unhealthy food.

3.3 Implementation

The vocational high school where the research was conducted has no computer lab or any computers that students could use. Therefore, the researcher provided six laptops for classroom use, and designed the instruction and arranged classroom activities so that six students could work on the computers during class time. While the rest of the class was doing content integrated activities, six students completed the reading material on the computer. This process was repeated until all the students completed the reading individually so that no student could miss any part of the lesson. Additionally, the English class met at a workshop at the school rather than a traditional classroom during the study so that a more convenient space was provided to simultaneously carry out group work and computer use. This workshop was

actually reserved for the Child Development courses, and special permission from the principal and other vocational area teachers was obtained to have the English lessons there.

3.4 Participants

The participants of the study were 9 male and 32 female 11th grade students studying in a public vocational high school. Because five of the students were part of a special inclusive education program, data from their work were not included in the final analysis (see Table 1 for the number of students in each group).

Table 1. Number of students in each group

	Female	Male	Total
Experimental Group	16	4	20
Control Group	11	5	16

The school where the study was conducted serves students who have received low scores on the national high school entrance exam. Therefore, the students were not necessarily academically oriented when they came to the school, and general teacher expectations were not very high. The overwhelming majority of the students came from families with low socioeconomic status. The neighbourhood where the school is located is an underdeveloped area of the city. Some of the students did not have a computer at home. It can be assumed that the students' exposure to technology, except smart phones, was quite limited.

The experimental group consisted of 4 male and 16 female students enrolled in the Child Development program, whereas the control group included 5 male and

11 female students from the Nursing program. The researcher was also the English instructor of both of the groups. The English lessons were offered 4 hours per week. Both of the groups followed A2.2 level course book, provided by the Ministry of Education. However, the students were pretty below the assumed language proficiency of A2.2. Since previously formed classes were used in the study, the groups were conveniently selected.

3.5 Data collection

Two pre-tests, unit exam and language test, based on the language objectives of the unit called *Health and Diet* were given to both of the groups. In addition to these tests, two additional pre-tests about the content area, one in English and one in Turkish, were conducted in both of the groups. Although the content pre-tests included similar content about child nutrition, one of them was in Turkish and consisted of more complex questions, whereas the other was composed in simple English.

All of the work created by the experimental group were collected and saved for later analysis, including the giant food pyramid, videos they recorded and integrated using *Aurasma*, the concept books about child nutrition prepared in groups, and the individual concept books on *Storybird*. The students' presentations about the food pyramid were also recorded to analyse how they used language in a content-driven situation. The individually and collectively created concept books were collected and examined for further analysis to see what kind of learning was taking place, regarding the content as well as the language In addition, the participants from both the groups were required to write recipe so that a comparison

could be made between groups. The recipes were collected and saved for further analysis.

At the end of the implementation, four post-tests the same with the pre-tests were conducted. In the middle and end of the implementation, the participants in the experimental group were asked to reflect on their experience of the implementation in order to see the perceived effectiveness of the study. Additionally, the experimental group was asked to give feedback on the effectiveness of scaffolding components of the readings.

3.5.1 Instruments

The two content knowledge and two language achievement tests conducted at the beginning and end of the study were given to both the groups of participants. Only the experimental group answered feedback questions about the implementation and scaffolding features.

The pre and post-tests on language were intended to be interchangeable and developed in line with the language objectives of the unit on *Health and Diet*. The reason for employing two tests with the same aim was to analyse the students' language skills using a more specific language test that contained question formats the students were not very familiar with, and a regular unit test which was similar to a regular course exam the students usually take. The real classroom setting with limited English learners compelled the researcher to use customized tests instead of standardized ones. Since it was an exploratory study with materials design as the main focus, the research instruments were in the same format as regular classroom exams, with no formal reliability measures taken. All the materials were designed for

a specific group of learners having a specific aim, and therefore the effectiveness of the materials was evaluated via these specifically designed tests.

3.5.1. 1 Unit exam

One of the two tests on language taken by both the experimental and control groups was the unit test. This test had five sections to assess target vocabulary, reading comprehension, target grammar structures, and writing (see Appendix A). It included 15 fill-in-the-blanks questions, 15 matching items, five open ended questions about a short text, and one question on writing about giving advice with the target structure *should*.

3.5.1.2 Language test

The general language test, intended to evaluate language gains, was developed in collaboration with a professor who has expertise in TEFL. It consisted of three sections: select the correct option, odd one out, and mark as grammatically correct/incorrect (see Appendix B). The first two section of the test dealt with content vocabulary and common vocabulary, which both of the groups studied during the classes. The final section aimed to evaluate grammar, which was conditional clause type 1, and the modal verb should/shouldn't. The first part had 15 questions which required learners to circle the correct option out of two choices. The second part included 10 questions each of which had four vocabulary items, and the learners were expected to find the irrelevant one. The grammar section was made up of 10 sentences that the test takers would determine whether or not they were grammatically correct. The same test were implemented as post-tests at the end of the intervention.

3.5.1.3 Content knowledge tests

Two tests were used to assess content-area learning. The pre-tests were developed with the same content objectives but in two different languages, at two different levels of language complexity. The one in Turkish included 20 multiple choice questions that made use of a lot more complex grammatical structures than the English version, which had 10 multiple choice questions covering the same content, but using only simple structures the students are familiar with (See Appendix C and D). Both tests were developed by the researcher with the help of the content teacher working at the same vocational high school, and the questions were consistent with the unit selected from the 12th grade course Child Self-care. Table 2 shows the thematic distribution of the questions on content test in Turkish. At the end of the intervention, the same tests were completed as post-tests.

Table 2. Thematic Distribution of the Questions on Content Test

	Food Pyramid	Do's & Don'ts of Child Nutrition	Healthy/Unhealthy Food
Number of Questions	6	9	5

3.5.1.4 Feedback on scaffolding features

Apart from the pre and post-tests, the participants in the experimental group were asked to evaluate the effectiveness of the scaffolding techniques used in the e-books on a. Six components of were embedded in the readings on computer created with *Articulate Storyline*. The participants evaluated each scaffolding feature on a five-

point Likert scale with options that varied from completely agree to completely disagree (see Appendix E). These features were:

- Picture dictionary including the definitions or the Turkish translations of the words embedded in the readings
- Various representations of the food pyramid
- Examining what constitutes certain food
- Shopping list
- Comparing different ways of cooking the same food
- To do list

3.5.1.5 Reflection questions

The reflection questions asked in the experimental group were in Turkish, and the students responded in written form in Turkish (See Appendix F). The questions, intended to evaluate the effectiveness of the implementation, were open-ended, and varied based on the stage of the implementation. While the questions asked midway through the study were intended to evaluate the effectiveness of the lessons by then, the ones asked in the end addressed the general effectiveness of the implementation. The reflection questions asked midway through the intervention were as follows:

- What are the difficulties that you have encountered during the implementation so far?
- What are the most enjoyable parts of the lessons?
- What do you think you have learned so far?
- What are the things that need to be changed?

While this evaluation aimed to find out the efficiency of activities having done so far, the one carried out at the end was more like a general evaluation of the

implementation. Therefore, the questions were modified. The following questions were asked at the end of the study:

- How did you find the lessons?
- Do you think this implementation has had an effect on your motivation to learn English? If so, how?
- What are the beneficial aspects of the lessons?
- What are the negative aspects of the lessons?

3.5.2 Procedures

Before carrying out the study, the researcher secured approval from the Institutional Review Board and Ethics Committee of the university and the administration of the school. Both students and their parents were informed about the study. Consent forms were distributed to the students and the parents before the intervention.

Both control and experimental groups followed five week syllabus designed by the researcher, who was also the English teacher of both groups. Before the intervention, both groups took two pre-tests on language skills. In addition, both groups took two pre-tests about the content mastery of Child Nutrition in English and in Turkish.

During the intervention, the experimental group followed technology and content integrated activities, and technology was integrated nearly in all of the lessons to support learning. No explicit grammar or language instruction was provided. The activities required individual, pair, or group work, and were conducted in one of the workshops of the school, since space was needed for the computer set up. The groups were formed by the teacher, but each student's consent was sought

before the intervention. Each group had at least one student whose English level was above the average of the class.

The control group followed regular textbook-based activities in their regular classroom. Explicit grammar instruction was provided in this group. The only activity in common was to write a recipe (a healthy recipe for kids in the experimental group). Apart from that task, the control group completed the exercises in the textbook, such as matching, answering reading comprehension questions, and listening for specific information.

Both groups targeted the same grammar topics language-wise: *should/shouldn't* and *conditionals type 1*. Moreover, the same vocabulary items about food, nutrition and cooking were covered in both groups. However, while the experimental group learned the target vocabulary within the theme of child nutrition supported by technology, the control group followed a regular textbook-based syllabus (see Appendix G, Table G1 & G2). In addition to the common vocabulary items, the experimental group practiced other content related words about the child nutrition, as well.

The experimental group was informed that each week they would complete an interactive reading on the computer. Since the students were going to take turns to use the laptops set up in the workshop, the researcher prepared a chart to remind the students their turn to complete the activities, and this chart was hung on the wall of the class. The weekly schedule for both groups and procedures of the study are listed in Table 3.

Table 3. Experimental Procedures

	Experimental group (Technology and content integrated instruction)	Control group (Regular textbook-based classroom instruction)
Week 1	Pre-tests Pre-test on language proficiency Pre-test on content mastery(child nutrition) in English Pre-test on content mastery(child nutrition) in Turkish Introducing the implementation	Pre-tests Pre-test on language proficiency Pre-test on content mastery(child nutrition) in English Pre-test on content mastery(child nutrition) in Turkish
Week 2	Activities related to Food Pyramid for young children Reading on computer called *At the Supermarket* Group presentation of food pyramid for kids	Activities related to the unit *Are you health conscious?* Supplementary text on food pyramid
Week 3	Activities related to Child Nutrition Reading on computer titled *Ordering Food* Chart presentations about do's and don't's on child nutrition as groups	Activities related to the unit *Can I help you?*
Week 4	Activities related to daily meal plan Reading on computer titled *In the Kitchen* Individual writing on a healthy recipe for young kids	Activities related to the unit *Eat Healthy Live Happy* Supplementary text on daily meal plan Individual writing on a recipe
Week 5	Preparing hard copy concept book as groups Preparing picture book on *Storybird* individually	General revision

3.6 Data scoring

The students' real names were replaced with pseudonyms for anonymity concerns. All the data scoring and analysis were implemented using the pseudonyms.

3.6.1 Unit exam

The unit exam included 4 types of questions: fill-in-the blanks, matching, and open ended questions. It consisted of five different parts, each of which had different point values. An answer key was prepared, and the pre-tests and post-tests were scored according to this answer key. Each question in the first part was worth one point. Since there were 15 vocabulary items for matching, the total score for the first part was 15. The second part was on reading comprehension, and included five questions worth four points each, with a total of 20 points. In the third section, two points were given for each questions, and 10 questions constituted 20 points. The fourth section had 10 fill in the blanks questions, each worth two points, with a total of 20 points. The fifth and final part required writing, which had a value of 25 points. The maximum score was 100.

3.6.2 Language test

Each correct answer on this test was worth one point. The first two sections were on target vocabulary. The first section contained 15 questions that asked the test taker to choose the correct word from two options. In the second section, the students were expected to find the odd one among four options, and this part included 10 questions. The final part of the test constituted of 10 sentences, which were to be marked as grammatically correct or incorrect by the test taker. In total there were 35 questions, and the maximum score was 35.

3.6.3 Content tests

In the content tests, there was only one correct answer for each question. In the Turkish version, each question had a value of five points. Since there were 20 questions, the total score was 100. As for the English version, each question was worth 10 points and the maximum score was 100.

3.6.4 Feedback on the effectiveness of scaffolding features

The participants' responses on the five-point Likert scale were added up, and a total score was calculated for each scaffolding feature. Then the average for each scaffolding feature was taken in order to analyse the effectiveness of each scaffolding component of e-books.

3.6.5 Reflection questions

The participants' responses on open ended questions about the possible benefits and drawbacks of the implementation were gathered in two sessions –midway through the implementation and in the end. The similar responses to each questions were put into the same categories.

The feedback session which was implemented at the middle of the study constituted four questions. The answers given to the first question about the difficulties that the students had been experiencing were categorised into three as no difficulty being faced, challenges about components of the intervention and language-wise difficulties. The categories of the responses to the second question about the enjoyable aspects of the implementation were gathered into three groups which were content-wise, technological components and language-wise. The third question was about what they think they have learned so far and the responses were

classified as content related and language related. What to be changed was the last question, the responses to which were categorized into three categories such as no need for change, the number of unknown vocabulary and the tests.

On the other hand, the questions were changed for the final reflection questions and the responses were separated into relevant groups. The students responded with descriptive adjectives to first question about how the participants found the overall study and these answers were classified as enjoyable, instructive, motivating, productive, actively participated and useful. The second question aimed at identifying the possible motivation increase towards language learning and the source of this possible motivation increase. The students gave responses such as no change in motivation, little motivation increase, and large motivation increase resulted from theme-based activities and improved language skills. The positive aspects of the study were categorized into vocabulary gain, learning new information and content related topics, usefulness of the study and group work. Lastly, the negative aspects were gathered into three groups as no negative side, sometimes feeling bored and complex sentences.

3.6.6 Class work

In addition to pre and post-tests, the class work evaluated to assess learning outcomes in the experimental group were individual *Storybird* books, the concept story-books for which each student created a page, the presentation videos, and the healthy recipe. The healthy recipe was a writing task, also done in the control group, so these were scored for both groups.

All of the written tasks, including the recipe were evaluated using the writing rubric designed by Brown (2000) (see Appendix H). This rubric has five parts:

content, organization, accuracy, vocabulary, and spelling and punctuation. Each section is worth five points. The written tasks were evaluated according to the quality of the students' writing in terms of these five criteria. The total score a student could get was 25. Two raters - the researcher and an independent rater who was also a teacher of EFL graded each work in order to ensure interrater reliability.

Although printed concept books was a group work, each student was supposed to design a page of the book. Thus an individual evaluation could be made for the task, as well. The same writing rubric was used to score the hard copy concept books created in groups, and the *Storybird* books created individually online in the experimental group, the maximum score one could get from these tasks were also 25 each.

The remaining of the class work aimed at speaking performance. The videos recorded while the students were presenting the food pyramid were assessed using an oral presentation rubric created by Toth (2010) (Appendix I). This rubric included five criteria: eye contact, enthusiasm, preparedness and organization, speaking clearly, and knowledge of content. Each part is worth five points, and the maximum score one could get is 25 points.

3.7 Data analysis

First, the data collected via pre and post tests were checked for normality and skewness with Shapiro-Wilk tests. Since the data was not normally distributed in all the tests, the data transformation was implemented based on the skewness values of the variables. After the data transformation, unit exam and content test in English tests were still not normally distributed. The language and content test in Turkish, on the other hand, were now normally distributed. Therefore, Repeated Measures

ANOVA test with Bonferroni correction was applied for the tests where normal distribution was found, i.e the language and content test in Turkish, in order to compare the scores of the two groups. On the other hand, Kruskal-Wallis H test was carried out to compare the mean scores of the experimental and control group as a non-parametric test for unit exam and content test in English. Additionally, the scores from a recipe writing task, which was part of in-class work, were also normally distributed. Therefore, One Way ANOVA test was conducted to compare the means of the experiment and control groups on this task.

Next, the pre-test scores for all the tests were analysed to investigate if both groups were compatible regarding prior knowledge. Since the experimental and control groups came from distinct vocational departments, their pre-test scores only on the content test in Turkish were significantly different. Thus gain scores from post to pre-test were calculated and one way ANOVA test was carried out with these gain scores to abolish the effect of prior content knowledge. As for comparing the pre-test scores of each group to its post test scores, Paired Samples t-test was used where the data was normally distributed, to detect whether or not the post test scores of the participants were significantly different from their pre-test scores. For the scores where no normally distributed data was observed, Related Samples Wilcoxon Signed Rank test was applied to compare pre and post test scores of the participants.

CHAPTER 4

FINDINGS

This section presents the findings based on the analysis of scores obtained in IBM SPSS Statistics Version 21. The results of each test are discussed in separate headings.

4.1 Language test

The data from the language pre and post-tests were normally distributed for both groups, as the Shapiro Wilk test showed (see Appendix J, Table J1 & J2), after the data was transformed with the square root transformation to reduce skewness. Then repeated measures ANOVA was applied. A 2 (Time) x 2 (Group) mixed ANOVA revealed the main effect for the groups was not significant ($F(1,34)=1.182$, $p= .285$), as shown in Table 4.

Table 4. Tests of Between-Subjects Effects in Repeated Measures ANOVA

Tests of Between-Subjects Effects						
Transformed Variable: Average						
Source	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.	Partial Eta Squared
Intercept	5411318.803	1	5411318.803	268.670	.000	.888
Group	23798.136	1	23798.136	1.182	.285	.034
Error	684797.975	34	20141.117			

As Table 5 shows, the main effect for Time x Group was not found, either ($F(1,34)=2.421$, $p= .129$). Therefore, there was no significant difference between the experimental and control groups. On the other hand, a significant main effect for time was observed ($F(1,34)=88.658$, $p= .000$). Thus, both groups showed a significant difference from the pre- to the post-tests.

Table 5. Tests of Within-Subjects Effects in Repeated Measures ANOVA

Tests of Within-Subjects Effects

Source		Type III Sum of Squares	*df*	Mean Square	*F*	Sig.	Partial Eta Squared
time	Sphericity Assumed	341079.336	1	341079.336	88.658	.000	.723
	Greenhouse-Geisser	341079.336	1.000	341079.336	88.658	.000	.723
time * Group	Sphericity Assumed	9312.669	1	9312.669	2.421	.129	.066
	Greenhouse-Geisser	9312.669	1.000	9312.669	2.421	.129	.066
Error (time)	Sphericity Assumed	130802.275	34	3847.126			
	Greenhouse-Geisser	130802.275	34.000	3847.126			

Similar results were found when only the vocabulary or the grammar questions in the language test were analysed separately with paired samples t-test for each group (see Appendix J, Table J3). The experimental group's scores showed a

significant difference from each part of the pre-test to the post test (p=.009, p=.001 and p=.002).

4.2 Unit exam

The skewness and kurtosis values and the results of the Shapiro Wilk test revealed that the data from the unit exam was not normally distributed (see Appendix J, Table J1 & J2). Therefore, Kruskal-Wallis H test was carried out as a non-parametric alternative for evaluating the pre-test scores. The experimental and control groups were found to be almost equal before the implementation (p= .425). When the post-test scores of the groups were examined, the test revealed a significant difference between the experimental and control group (p= .030). The experimental group outperformed the control group in the unit exam given at the end of the implementation (see Table 6).

Table 6. Kruskall –Wallis H Test for Unit Exam

	PREUnitExam	POSTUnitExam
Chi-Square	.636	4.693
df	1	1
Asymp. Sig.	.425	.030

Since the data was not normally distributed, related samples Wilcoxon signed rank test was conducted to investigate the difference between pre-test and post test scores for the experimental group (see Appendix J, Table J4). A significant difference was found between their pre-test and post test scores (p=.010).

The unit exam scores of the control group showed a normal distribution, thus Paired Samples T-test was conducted to find out whether there was a significant difference between pre and post test scores (see Appendix J, Table J5). The pre-test scores were significantly different from the post-test scores for control group (p=.017).

4.3 Content tests

The data from the content test in English was not normally distributed for both groups. Thus non parametric tests were implemented to analyse the data. As Table 7 shows, Kruskal-Wallis H test demonstrated that the scores of the experimental and control groups of the pre content test in English were not significantly different (p= .855). Hence, it can be inferred that both groups were at the same level regarding content knowledge before the intervention. A Kruskal-Wallis H test revealed that the scores of the post content test in English were significantly different between the groups (see Table 7). The experimental group outperformed the control group (p= .001).

Table 7. Kruskal-Wallis H test results for Content Test in English

	PREContentEng	POSTContentEng
Chi-Square	.033	11.532
df	1	1
Asymp. Sig.	.855	.001

As for the differences between each group's pre-test scores and post test scores of the content knowledge test in English, related samples Wilcoxon signed

rank test was used (see Appendix J, Table J6). There was a significant difference between the pre and post test scores of content knowledge test in English (p= .000). On the other hand, the scores of the control group showed no significant from the pre to the post content knowledge test in English (p= 1.000).

The scores of the content test in Turkish were found to be normally distributed (see Appendix J, Table J1 & J2). An independent samples t-test on the pre-test scores showed that the two groups were significantly different at the beginning of the intervention (p=.000). This showed that their background knowledge was not at the same level before the implementation (see Appendix J, Table J7). Therefore, gain scores analysis was carried out in order to eliminate possible effect of pre-test scores on the post-test.

After gain scores between post-test and the pre-test scores were calculated for both groups, one way ANOVA was conducted to compare the groups' scores on the Turkish content knowledge test (see Table 8). The results of ANOVA revealed a significant difference in the gain scores of the two groups (p= .000). Therefore, it can be stated that the experimental group (M= 4.35, SD= 1.49) outperformed the control group (M= .95, SD= 2.51) in the content knowledge test in Turkish.

Table 8. The Results of One Way ANOVA on Content Test in Turkish

	Sum of Squares	*df*	Mean Square	*F*	Sig.
Between Groups	103.513	1	103.513	25.598	.000
Within Groups	137.488	34	4.044		
Total	241.000	35			

As for the difference within the experimental group itself, there was a significant difference between their pre and post-test scores in the Turkish content knowledge test (p=.000), as a paired samples t-test showed (see Appendix J, Table J8). However, no significant difference was observed between the pre- and post-test scores of the control group (p=.157).

4.4 Reflection questions

The answers to the reflection questions about the possible benefits of the implementation for the experimental group were tallied and grouped in two instalments depending on when the questions were asked, midway through the implementation or at the end.

The questions asked in the middle were categorized into four groups: difficulty/challenges, enjoyable aspects, what the participants have learned so far, and what needs to be changed. Figure 8 shows the answers given the first time they were asked, i.e midway through the implementation. Twelve students indicated that they did not experience any difficulty during the implementation till then, whereas six students said some of the components were challenging for them. The most challenging aspects were some components of implementation such as making a presentation, and the stress that they experienced at the first day of implementation and language related problems. As for the enjoyable aspects, the answers fell into three categories. The most frequently cited enjoyable aspect was the technology integration: reading on the computer and using *Aurasma*. The content related activities, such as creating a food pyramid, were chosen by 12 participants. Lastly, 10 students indicated that language achievement activities such as making presentation and speaking in English were most enjoyable for them.

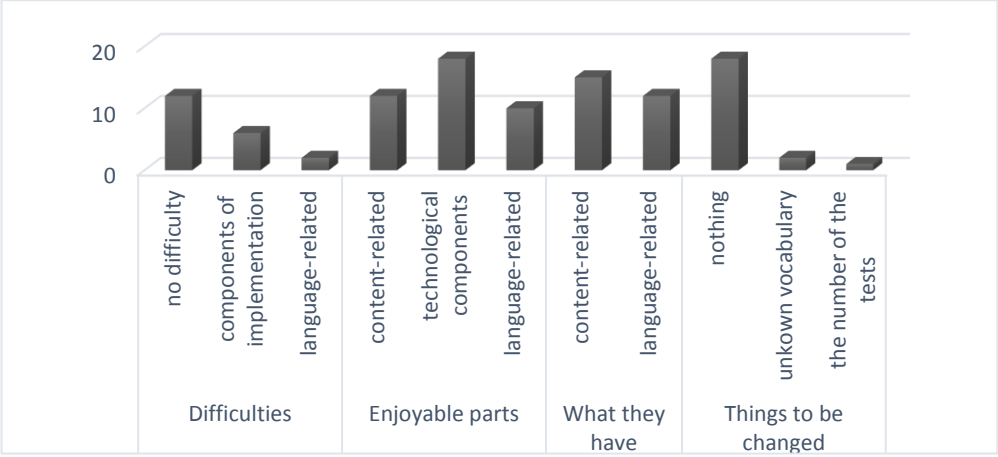


Figure 8. The responses to the reflection questions (first time)

The responses to the question about what the students learned could be grouped into two: language-related gains and content-related gains. Fifteen participants claimed that they had learned new information about content, such as the food pyramid and child nutrition, while twelve participants listed language related learning, such as grammar topics and vocabulary items, and how to speak English. Finally, the responses to the question about what needed to be changed, 18 out of 20 participants pointed out that there was nothing to change. While two students indicated that the number of unknown vocabulary should be decreased, one student suggested that the number of the tests be decreased.

There were only four reflection questions at the end of the study which were a bit different. The first question asked the participants how they found the study. Seventeen out of the 20 participants stated that they found the implementation enjoyable. Six students claimed that they had learned a lot and defined the study as instructive. In addition, the overall implementation was considered motivating by two students, and two students used the terms useful and productive to describe the study. Figure 9 shows the answers to the end-of-implementation questions.

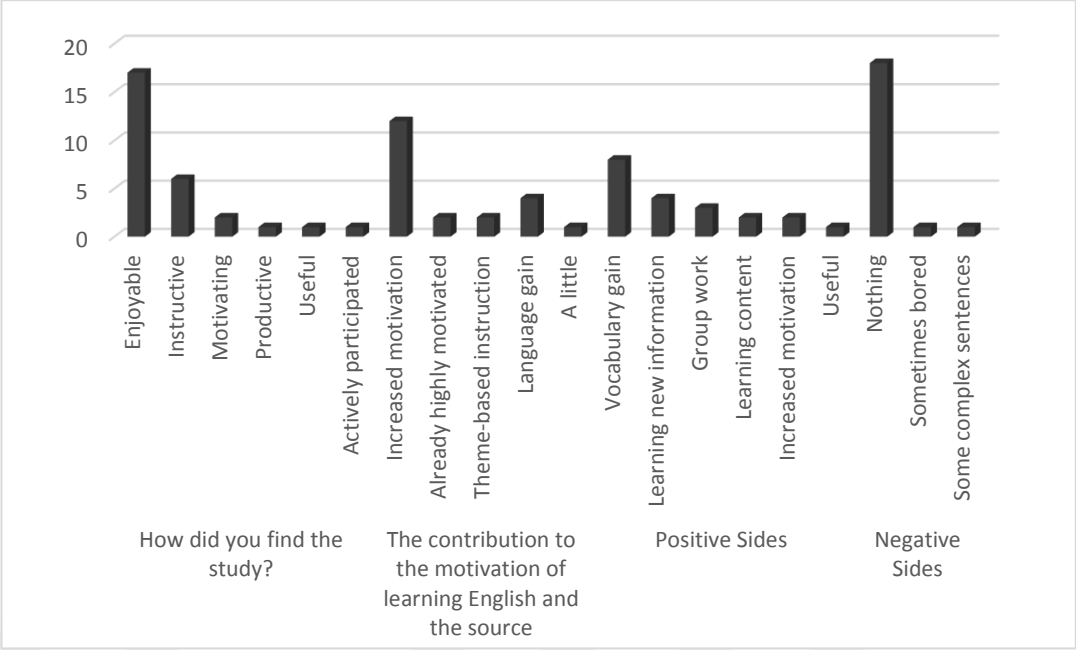


Figure 9. Responses given to the final reflection questions

As can be seen in Figure 9, when the effects of the study on the participants' motivation to learn English was asked, 12 out of 20 students considered themselves highly-motivated at the end of the study. Two students said they had already been highly-motivated to learn English. Only one student indicated that the study increased their motivation a little. The second part of this question was about the source of the increase in their motivation, if any. Four students reported the language gains they had achieved throughout the implementation caused an increase in their motivation whereas two said that it was due to the theme-based instruction.

The last two questions were about the benefits and drawbacks of the study and the results showed that 18 students mentioned no negative aspects. As for the benefits, or positive aspects, eight students mentioned learning new vocabulary items, and four students preferred learning new information in general. Other beneficial aspects listed by the participants were group work, learning content area knowledge, and the increase in motivation.

4.5 Feedback on the effectiveness of scaffolding features

The participants from the experimental group evaluated the effectiveness of the scaffolding features in the e-books on a 5-point Likert-scale. As can be seen in Figure 10, the two most beneficial scaffolding features according to all of the participants were the picture dictionary with definitions and translations, and salient food pyramid visual. The other useful features were the to-do list and the shopping lists that showed the progress and what to come next. However, as can be inferred from the table, comparing different ways of cooking the same food, various representations of the food pyramid, and examining what constitutes some of the food were not as effective as the others mentioned above.

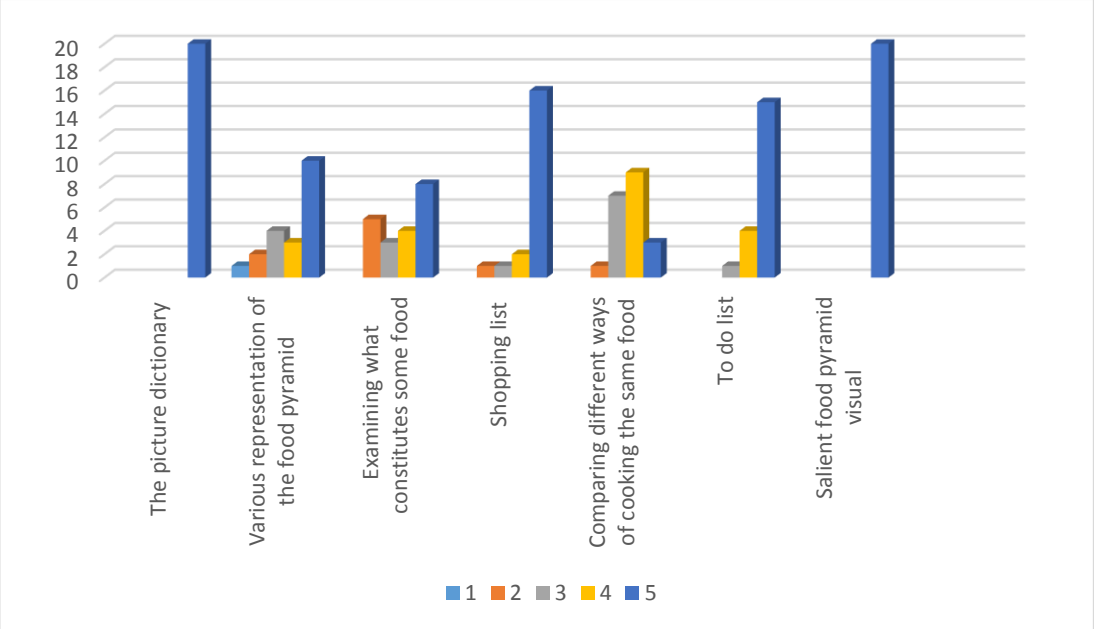


Figure 10. Feedback on the effectiveness of scaffolding features

4.6 Class work

One of the class works that the students completed during the implementation was to respond to the interactive items in the e-books. Figure 11 shows average scores obtained from four interactive e-books.

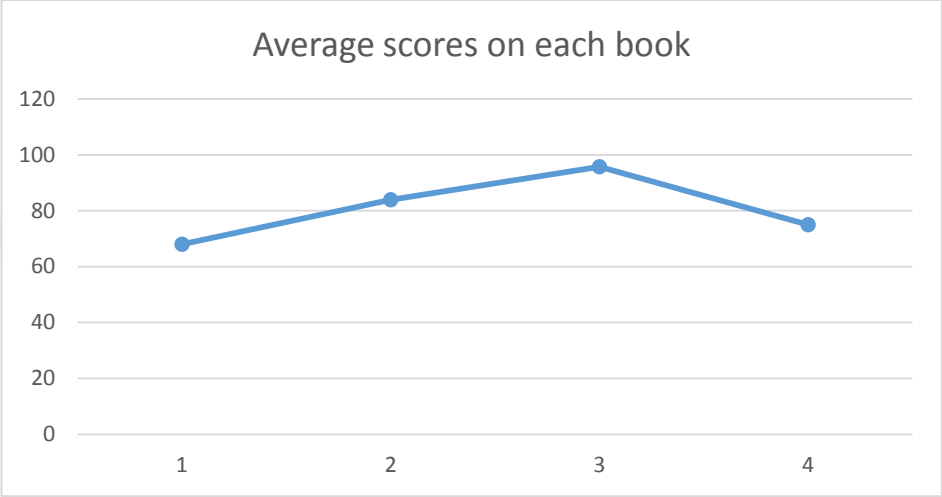


Figure 11. Percentage of correct responses students gave on the e-books

The first three e-books were enhanced with frequently placed scaffolding features, while the last one included few scaffolds. The average percentage of students' correct answers to the first reading was 67.9% (SD=8.2) whereas the average for the second one was 83.9% (SD=10.4). The average for the third reading was 95.7 (SD=5.2). All the students, except two, showed improvement from the first to the third e-book (see Appendix K, Table K1). Therefore, it can be concluded that there was an increase in the number of correct answers given to the question in the e-books during reading. The percentages of correct answers obtained from the last reading varied from 60 to 100, where only one student got the maximum score (M= 75, SD=10.2). Although the mean scores for the last e-book is lower than the second and third e-books, all of the students scored higher than they did in the first e-book.

The students in the experimental and control groups were asked to write a recipe, as part of the class work. The writing scores were normally distributed in both of the groups (see Appendix J, Table J1 & J2), therefore one way ANOVA was conducted to compare the two groups. As can be seen in Table 9, the experimental group (M= 17.95, SD= 3.22) significantly outperformed the control group (M= 13.50, SD= 3.61) in recipe writing (p=.000).

Table 9. The Results of ANOVA for Writing a Recipe Task

		Sum of Squares	*df*	Mean Square	*F*	Sig.
Writing Scores	Between Groups	176.022	1	176.022	15.230	.000
	Within Groups	392.950	34	11.557		
	Total	568.972	35			

Another writing activity for the experimental group was to write a few descriptive sentences about the assigned part of the food pyramid. This task was carried out in two steps. The printed concept book where each student prepared a page for the assigned part of the food pyramid was the first step. The scores given to the each page that only one student designed (see Appendix K, Table K2). It can be seen that the scores ranged from 19 - 24.5 (SD=1.46), and the average score was 21.7, which is quite successful (see Fig. 12).

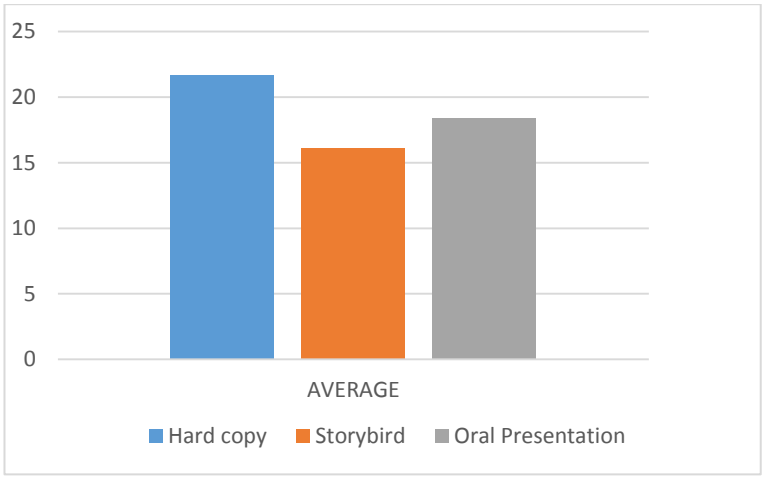


Figure 12. The mean scores of the comcept books and oral presentation

As for the second step, the scores obtained from the online and individual parts of the task varied from 13 to 19 (SD=1.77), and the mean of these scores was 16.1 (see Appendix K, Table K3). When compared to the first part of the task, the mean score was not very high (see Fig. 12).

The students in the experimental group presented the part of the food pyramid that they had been assigned, as a speaking activity. As measured by the oral presentation rubric created by Toth (2010), the students' scores on this task ranged from 9 to 25 (see Appendix K, Table K4). Two students achieved the highest score of 25. The average score was 18.4 (SD=4.25).

CHAPTER 5

DISCUSSION

The purpose of this exploratory study was to design and develop technology and content integrated activities and materials for the vocational high school students, and investigate the effectiveness of these materials, which were based on the CBI literature on the one hand, and scaffolding design guidelines on the other. Pre and post-tests on content learning and language achievement, particularly vocabulary and grammar gains, were conducted, and student feedback was collected about the various features of the instructional design, including those intended as scaffolding in the e-books. The results of the tests showed that the experimental group outperformed the control group in content tests in both Turkish and English, as well as the unit exam on English. No significant difference was found between the experimental and control groups in the language test. The experimental group showed a significant difference between pre and post-test of all four tests. On the other hand, although no significant difference was observed between the pre and post content knowledge test scores of control group in both languages, they showed a significant difference on the unit exam and language test. Additionally, the scores of the common writing activity in which students in both groups were asked to write a recipe showed that the experimental group significantly outperformed the control group.

That the experimental group significantly improved content knowledge both in English and in Turkish confirms findings from earlier studies where integrating content into foreign language classes showed better learning outcomes in content knowledge (Rodgers, 2006; Coyle, 2006; Seikkula-Leino, 2007; Snow & Brinton,

1988). In addition to content learning, the improvement of language test scores in this study is also in line with the literature. This result can be explained with what Cummins (1984) proposes in his quadrant for the analysis of language tasks. In the content and technology integrated design implemented in this study, cognitively demanding and context-embedded tasks that improve higher thinking skills were chosen, and consequently, better content learning occurred. Similarly, as Bereiter and Scardamalia (1993) suggested in theory of expertise, learners in content integrated language classes experience increased but manageable task complexity, which is an appropriate way to gain expertise.

The learning outcomes measured via tests were compatible with the feedback from the students, where they indicated that they enjoyed the content related activities, such as creating food pyramid in English. In that sense, the current study achieves one of the aims of the CBI approach, which is to use authentic and interesting media to create an environment where students enjoy learning the target language (Short, 1991).

Another claim by the advocates of content integration is that students in these classes will not fall behind those students who receive mainstream foreign language instruction, in language achievement tests, even if the explicit grammar explanation is not the only focus in approaches such as CBI a (Snow & Brinton, 1988). Although the students in the experimental group did not perform any better than the control group in the language test, they outperformed the latter in the unit test and recipe writing, which were also measures of language. Thus the experimental group could not only compete with the control group in terms of language gains, but was also able to significantly score higher in the unit test and the writing activity. This confirms the hypothesis that even though language classes with frequent use of

content do not necessarily involve explicit language instruction, the students will not fall behind, and even outperform those following a language focused instructional model.

It is understandable that the two groups showed similar performance on the language test, because the format of some sections in the test were unfamiliar for them. The unit test, on the other hand, employed question formats both groups were already familiar with. The significant difference between two groups' scores obtained from the writing a recipe task showed the effectiveness of the content and technology integration. Even though the students in the experimental group did not use a large variety of vocabulary related to the content area, all students could write a healthy recipe for young kids. This confirms the idea that students might learn both content and language with this kind of design. Snow, Met and Genesee (1989) argued that integrating content and language helps create a meaningful academic context, which would result in simultaneous language and content mastery, rather than separate or sequential learning of each (Wesche & Skehan, 2002). In doing so, comprehensible language input as proposed by Krashen (1982) was presented in the target language in this study. Thus comprehensible and meaningful language input and context helped students to compete with a group that received formal language focused instruction.

The students' preference for the picture dictionary with definitions and translations, salient food pyramid visual and ordered / unordered lists on screen as the most beneficial components of reading on the computer could be interpreted as an evidence for the success of incorporating scaffolds based on Quintana et al (2004)'s scaffolding design guidelines for educational software. The increase in the scores received from the activities in the e-books also supported the effectiveness of

scaffolds. Since these scaffolds provided expert guidance, the students stepped further to a point where they would have difficulty reaching alone, as proposed in Vygotsky (1978)'s Zone of Proximal Development. The effectiveness of the scaffolds in the interactive e-books were also confirmed by the observations of the researcher who was the English language teacher. The students who normally asked the definitions of the unknown vocabulary before the implementation, stopped doing so while they were interacting with the e-books. The reader could easily click on the unknown vocabulary and then switch to the main e-book due to the user-friendly design of the e-books.

The students' increased performance on the content questions that specifically addressed the content covered in the interactive e-books supported by scaffolds confirm the efficacy of scaffolding design guidelines proposed by Quintana et al. (2004), which emphasize the use of ordered and unordered checklists to facilitate process management by decomposing complex tasks into smaller parts. For instance, the students first bought food in one of the e-books with the help of shopping list on the screen, categorized as vegetable, fruit, or grain. The students were able to label each food based on what they have just learned about the food pyramid. The high scores obtained in that specific e-book showed that dividing the task into smaller pieces helped student understanding. Similarly, the food pyramid proved to be a useful visual conceptual organizer that facilitated the students' sense making process, as also recommended by Quintana et al (2004). It can be concluded that the students' comments on the interface and usability are consistent with the aim of the design.

The significant difference between the groups on content tests could also be associated with the effectiveness of informative feedback provided in the e-books.

Lightbrown (2014) stated that the feedback provided in content-integrated language classes was highly beneficial to the learners. Similarly, Sagarra and Zapata (2008) created and assessed the use of content-based electronic workbooks, and they found the immediate informative feedback and multiple attempts very effective. Mackey, Gass and McDonough (2000) affirmed that students benefit from computer generated informative feedback more than the traditional immediate feedback just stating try again and right or wrong.

The reason why the students indicated the first day of the implementation and making a presentation as the drawback of the study could be that presenting in a foreign language was a new activity for them, since the textbook mandated by the Ministry of Education allocates very little time for speaking. When the videos of the oral presentations were analysed deeply, the students' hesitation while talking could be observed, as well. The comments in the feedback received half way through the implementation related to the challenge of presentation actually disappeared in the end. Moreover, even if presentation in the classroom was challenging, the students were able to perform at a considerable level at the end, which is an indication that when students are challenged within their zone of proximal development and using appropriate technology, they can extend their language skills (Vygotsky, 1978; Swain, 1985).

The importance of comprehensible output is also emphasized in the content integrated language classes. That the students eventually indicated that they liked presenting in English, in complete contrast to what they had said in the first feedback, showed that the participants were able to deal with the challenge of presenting in a foreign language when they were provided with sufficient scaffolding. This was evident in some of the students' feedback: "I realized that I

was able to speak in English in the presentations, although I did not feel that I could at the beginning" Additionally, the students used both content related vocabulary, and target structure, *should/shouldn't*, in these presentations. This is consistent with findings from other studies that students can increase their levels of fluency in a second language when instruction is designed to integrate content (Loewen, 2013).

The results from the user feedback also showed that the participants enjoyed *Aurasma* and reading the interactive e-books on the computer, which is also compatible with the findings in the literature that the use of technology is perceived as a motivating strategy in foreign language classes (Brett, 2000; Kennedy, 2006). Similarly, most of the participants rated themselves as highly-motivated at the end of the intervention, even if boosting motivation for the English class was not particularly one of the aims of the present study. Although it may be difficult to find a common interesting content area for motivation increase as stated by Carrel and Carson (1997), the participants indicated that language and content gains were the reason why they felt highly motivated. It may be concluded what the participants focused on during the intervention was to learn both content and language, which was supposed to be achieved also with the help of technology-integrated CBI. Lighbrown (2014) showed that one of the reasons to combine content with foreign language teaching is to generate motivation.

That the students' responses to what they learned were mainly about content and language gains, confirmed the difference observed between the pre and post test scores of both content and unit tests. When asked what to change midway through the implementation, a great majority of the students responded that they were pleased with the current design, although only few of them identified the number of unknown vocabulary as something to be changed. When asked again at the end of the

implementation, everyone responded that the design was fine as is. This can be attributed to the motivating aspect of technology integration, as was shown by various researchers (e.g. Jamieson & Chapelle, 2008; Thomas, 2009; Liaw & English, 2017; Sauro & Chapelle, 2017).

It is noteworthy that there was not much mention of vocabulary as a possible area of difficulty. This might be interpreted as evidence that the students became more confident with their vocabulary knowledge as they learned more of it. The glossary on the e-books could also partly explain this finding, since the students expressed that the most beneficial scaffolding feature was the glossary. Additionally, the perceived benefits of the study, namely, learning new vocabulary and concepts, group work, content knowledge, and the increase in motivation may show how much the students were focused on learning during the lessons. The technology and content integrated instructional design made it possible to create a learning environment to achieve these benefits.

The adjectives the students listed to define the implementation were "enjoyable, instructive, motivating, beneficial, useful, and productive" when they were asked in the end how they found the lessons. It is possible that these positive attributes may be due to the novelty effect, since what the students experienced during the 5 weeks of implementation was brand new for them. However, the reason for integrating technology and content into the design was to create a language learning environment where the students are engaged deeply with the activities, and enjoy learning a foreign language because the content is compatible with their area of study, and thus personally relevant to them. Another possible reason for the students' positive feelings about the implementation might be that learning content related vocabulary is a good way to prepare learners for their future career, as stated by

Coyle, Hood, and Marsh (2010). Additionally, there is much research on the effect of technology use on the learners' motivation in a language class (Jamieson & Chapelle, 2008; Thomas, 2009; Liaw & English, 2017; Sauro & Chapelle, 2017). The present study confirms the previous findings in that sense. The effectiveness of the design is supported with both the significant difference in the test scores, and the students' positive feedback. The only drawback mentioned by few students was the large number of tests, which is actually more about the research design rather than the implementation.

5.1 Limitations

This study was conducted in a real classroom setting, because of which some substantial deficiencies occurred. A major limitation was caused by the physical conditions of the school where the study was carried out. Since there were no computer labs or any desktop or laptop computers that could be used at the school, the researcher brought six laptops for each session, and established network connection for the laptops and the smart board. Additionally, because of sufficient number of computers available at once, the lessons were designed so that the students took turns to work on the computer, while the others worked in groups.

Another limitation was the difference in the specialization of the control and experimental groups—the two groups of participants were from two different vocational areas. There was only one class in each department, which also varied in the number of students in each. Therefore, the researcher had to choose the control group from a different specialization area than the experimental group. Consequently, random sampling was not possible. However, that the researcher was also the English teacher of the two classes helped reduce these adverse effects.

An additional limitation was about the amount of time allowed for the study. There was only one window of opportunity to carry out the study when the EFL curricula in the experimental and control groups overlapped, due to the difference in their vocational areas. Because there was only a certain amount of time, it was difficult to design the scaffolds in the e-books in a way that they would decrease gradually. Instead, there was a steep decrease in the scaffolds from the third to the last e-book, which resulted in a visible decrease also in the students' scores.

Another important limitation was about the reliability of the tests used to assess the content and language gains. As the previous studies indicated, the number of scales to measure content mastery is scarce, therefore, the researcher designed the content tests in cooperation with one of the content teachers at the school. Since the participants had limited English, a standardized language achievement test could not be applied. Instead, the researcher prepared a language test in collaboration with two professors from the university, whose expertise is teaching English as a foreign language.

The feedback received from the experimental group showed that the participants believed their motivation to learn English increased. A motivation scale could have been implemented to measure the change in motivation level quantitatively. However, this was not one of the purposes the researcher set as a main goal of the study before it started.

5.2 Implications for further research and practice

This study was implemented in a vocational high school where a fundamental need for language and content integration was observed by the researcher. In order to fulfil this need, content and technology integrated language lessons were chosen as an

instructional method. Further research in vocational schools could be carried out, since there are limited number of studies on this area, especially in Turkey. A similar research may be conducted in a school where there are at least two classes from the same vocational department. This could help to create a better insight and more robust findings about the possible effectiveness of technology-integrated language classes with frequent use of content, or even theme-based instruction in the context of vocational high schools., Seikkula-Leino (2007) stated that learning the content in a foreign language might have a negative effect on content learning, thus future research comparing the effectiveness of the content instruction in the mother tongue with the one in a foreign language might provide a basis for further practice.

Based on the findings of this study, it could be beneficial to conduct a similar study during an entire semester or a school year. Even if a period of five weeks is not very long, the framework integrating content and technology was advantageous for the learners, and when the instruction was designed in accordance with the students' needs, even the participants with low academic achievement in English as a foreign language could improve their performance.

Because of the time limitation and proficiency levels of the participants, this study was generally focused on vocabulary and reading skills. Only a small number of activities which required the students to construct sentences with the target vocabulary or making presentations were included. Further research could be carried out that target writing and speaking skills. When more time is devoted for this kind of research, the four language skills could be balanced more equally, and thus robust findings could be obtained for all of the skills involved.

In order to obtain a deeper insight into the type of scaffolds that are most useful for similar target groups, interactive EFL e-books supported with different

amounts and types of scaffolds could be designed, and the effectiveness of each type could be compared to determine the most beneficial scaffolding features. Similarly, various types of feedback might be integrated into the e-books, and the effect of each type of feedback on content and language learning could be evaluated. Especially, embedding content-focused or language-focused feedback into the e-books would be an area of research that needs to be explored.

Another implication for future research could be to investigate the effect of a similar instructional design on participants' motivation and engagement levels. The small number of studies dealing with the relationship between motivation and content integration in Turkey that could be located were mainly experimental studies. Enriching motivation scales with qualitative research methods such as interviews and observations would help develop better understanding of the student perspective. Longitudinal research is needed to observe long term effects of such studies.

It can be concluded that integrating content and technology is an effective method for language learning, however designing a technology integrated syllabus with frequent use of content in the foreign language class requires a huge amount of work, such as creating cross-curricular links between the content area and language. The researcher as the teacher of both groups took online courses on child nutrition and read a lot about the topic in order to get ready for teaching the topic in English. Vocational English courses following a content integrated approach rather than the regular English lessons might be offered by the Ministry of Education. English lessons could be designed within the students' needs, which would create a meaningful purpose to learn a new language. The Ministry of Education recently included Vocational English courses in the curriculum of a number of vocational departments, however, this should be applied in all specialization areas. The

vocational high school students would thus be more motivated to learn a foreign language. Vocational English courses may be a good place to start creating a meaningful and motivating environment for these students.

This study presented valuable findings for future researchers, English language teachers working in a Vocational high school, and policy makers in favour of content and technology enhanced language lessons. Unfortunately, after this study was completed, the Ministry reduced the number of English lessons per week in vocational high schools in 2017. It should be noted that the more the learners are exposed to the language, the better they learn. Therefore, instead of decreasing the number, policy makers should take action to help create a motivating language learning environment where the students' needs and interests are taken into consideration.

APPENDIX A

UNIT EXAM

A. Write the words in the correct boxes. (15x1=15pts)

chips, bananas, spinach, green apples, chocolate, beef, sweets, carrots, grapes, fizzy drinks, fish, biscuits, onions, steak, broccoli

Vegetable	Fruit	Meat	Junk Food

B. Read the text and answer the questions. (5x4=20pts)

Doctors in Britain are worried because British teenagers eat lots of crisps, sweets and fat food. Most teenagers don't eat enough fruit or vegetables and more than one million British school children are overweight,

Some teenagers say that they don't have time to eat good foot, but kids who have a poor diet often have health problems when they are older.

Americans have been familiar with fast food for a long time, it was born there. American fast food is now a part of life far beyond the stores of United States. McDonald's Pizza Hut, Burger king have restaurants all over the world.

Now doctors are giving young people books and games about a good diet. Having healthy, well-balanced diet can help you feel better and live longer.

1- Why are British doctors worried?

_____

2- Do young people normally eat vegetables and fruit?

_____

3- Why do some teenagers eat fast food?

_____

4- What kind of problems can a poor diet bring?

_____

5- What should we do to have a longer and better life?

_____

C. Fill in the blanks with the words below. (10x2=20pts)

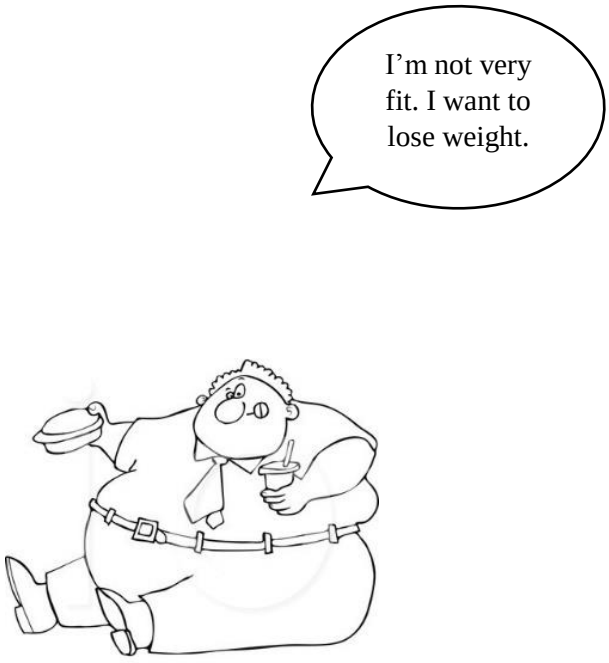
crisps, nutrition, familiar, nutritious, worried, healthy, well-balanced, servings, diet, overweight

1. The teacher discussed diet and _____ with the class.
2. In order to have a _____ diet, every morning she eats _____ food rather than unhealthy ones.
3. It is important to eat highly _____ food.
4. This recipe makes four _____ of rice and beans.
5. He looked _____ but I couldn't remember his name.
6. My sister is thin, but I'm a little _____.
7. She lost a lot of weight through _____ and exercise.
8. Her parents were _____ when she didn't come home at night.
9. My mom doesn't want me to eat lot of _____.

D. Fill in the blanks with correct tense. (10x2=20pts)

1. If I_____ (study), I_____ (pass) the exams.
2. If the sun_____ (shine), we _____ (walk) into town.
3. If he_____ (have) a good grade, his mom_____ (buy) a bike.
4. If my friends_____ (come), I_____ (be) very happy.
5. If she_____ (earn) a lot of money, she_____ (fly) to New York.

E. Give advice to the man with should/shouldn't. Write 5 sentences. (25pts)



_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

APPENDIX B

LANGUAGE TEST

A. Read the sentences and circle the correct word. (Cümleleri okuyup anlamca uygun olan sözcüğü yuvarlak içine alınız.)

1. We should eat lots of fruit and vegetables because they are **frozen / nutritious.**

2. A child between 12 and 36 months is a **teenager / toddler.**

3. Eating less **processed food / whole grains** will help you to grow up well.

4. Tom wants to lose weight, so his diet is low in **milk / fat**.

5. Eating one or two **servings / boxes** of fish every week is very healthy.

6. Parents should feed their children according to the food **chain / pyramid**.

7. Beans, celery, parsley and lettuce are **vegetables / fruits**.

8. Apples and strawberries are different in both taste and **texture / meal.**

9. What are the **chemicals / ingredients** to make a pancake?

10. Instead of taking pills to lose weight, it is healthy to have a **well-balanced / harmful** diet.

11. Tom doesn't allow his children to eat **junk food / organic food.**

12. The doctor told me to eat fewer **unhealthy / confused** snacks**.**

13. Language **nutrition / development** is important in early childhood.

14. It is important to eat food with lots of **fiber / pastry.**

15. **Grilling / Frying** is not a healthy way of cooking.

B. There are related words in each line but one of them is different. For each question, decide which one is different. (Aşağıda her satırda verilen 4 sözcükten biri anlamca diğerlerinden farklıdır. Anlamca farklı olan sözcüğü yuvarlak içine alınız.)

1. butter milk egg cheese

2. pineapple nut melon tangerine

3. bake roast cut boil

4. fork knife spoon flour

5. chop portion grate stir

6. lettuce pear peas cauliflower

7. bread rice pasta sausage

8. water coke juice lentil

9. chocolate candy sweet aubergine

10.meat chicken fish pomegranate

C. Read the sentences. Write (+) for correct and (-) for incorrect sentences. (Aşağıdaki cümleleri okuyunuz ve dilbilgisi açısından doğru olan cümlelerin yanına (+), yanlış olanların yanına (-) yazınız.)

1. If we will be late, they will be angry.
_____

2. What will happen if I push this button?
_____

3. You look tired. You shouldn’t work so hard.
_____

4. Alice wants to leave early today. She should talk to her boss.
_____

5. You don’t have much money. You shouldn’t went out so much.
_____

6. If you don’t wants to be overweight, you should go on a diet.
_____

7. It’s raining. You should take an umbrella with you this morning.
_____

8. If Mark don’t arrive soon, I will phone him.
_____

9. Sarah doesn’t should smoke so much. It's not good for her health.
_____

10. If I stop eating cakes, I will lose weight.
_____

APPENDIX C

CONTENT TEST IN TURKISH

Besin piramidine göre 2-6 yaş arası çocukların aşağıdaki besinlerden günde kaç porsiyon yemeleri gerektiğini yazınız.

1. Yağlı ve şekerli ürünler:_____ porsiyon

A) 1-2 B) 2-3 C) 3-6 D) 4-6 E) 5-6

2. Et ve et ürünleri:_____ porsiyon

A) 1 B) 2 C) 3 D) 4 E) 5

3. Süt grubu:_____ porsiyon

A) 1 B) 2 C) 3 D) 4 E) 5

4. Sebzeler:_____ porsiyon

A) 1-4 B) 2-3 C) 3-5 D) 4-5 E) 5-7

5. Meyveler: :_____ porsiyon

A) 1-4 B) 2-3 C) 3-5 D) 4-5 E) 5-7

6. Tahıllar:_____ porsiyon

A) 1-2 B) 2-3 C) 3-6 D) 4-6 E) 5-6

7. Aşağıdakilerden hangisi okul öncesi çocuğa iyi beslenme alışkanlığı kazandırmak için yapılması gerekenlerden değildir?

A) Çocuklara tüketebilecekleri düşünülenden daha fazla besin verilmelidir.
B) Çocuklara yemek yemenin bir gereksinim olduğu öğretilmelidir.
C) Çocukların açlık belirtilerine kulak verilmelidir.
D) Çocukların yemeklerini kendilerinin yiyebilmesi için olanak sağlanmalıdır.
E) Çocuk her seferinde tabağındakileri bitirmesi için zorlanmamalıdır.

8. Aşağıdakilerden hangisi işlenmiş bir besindir?

A)Karnabahar B) Çilek
C) Sucuk D) Süt E) Mercimek

9. Aşağıdakilerden hangisi okul öncesi çocukların gösterdiği beslenme alışkanlıklarından değildir?

A) Çocuklar özellikle meyve ve sebze gibi yeni yiyecekleri denemekte isteksiz davranabilirler.
B) Sofrada oturmasına rağmen bazen başka şeylerle ilgilenebilirler.
C) Çocukların sevmedikleri yiyecekleri yemeleri için üzerlerine gidilirse o yemeği sevmeye başlarlar.
D) Çocuklar belli renk veya dokulardaki besinleri yemeyi reddedebilirler.
E) Çocuklar sevdiği besinleri seçip diğer besinleri yemeyi reddedebilirler.

10. Bir akrabanız çocukları yemek yemek istemediği için üzülüyor. Yemek yemeyi cazip hale getirmek için akrabanıza aşağıdakilerden hangisini tavsiye edersiniz?

A) Çocukları için her zaman hamburger ve patates kızartması yedek olarak bulundurabilir.
B) Makarna ve pilavı bol yağlı ve tuzlu yaparak çocukların damak tadına uygun hale getirebilir.
C) İkindi öğününde bol şekerli tatlılar tercih edebilir.
D) Hamur tatlıları yerine sütlü meyveli tatlılar yapabilir.
E) Farklı makarna çeşitleri yerine her zaman sade ve sossuz makarna tercih edebilir.

11. Annesi Filiz'e daima doğal besinler yemesi gerektiğini söylüyor. Buna göre Filiz aşağıdakilerden hangisini yememelidir?

A) Yumurta
B) Elma
C) Tereyağı
D) Çikolata
E) Salatalık

12. Aşağıdaki pişirme şekillerinden hangisi daha sağlıksızdır?

A) Haşlama
B) Kızartma
C) Fırında pişirme
D) Izgara yapma
E) Buğulama

13. Okul öncesi çocuklarda beslenmeyle ilgili olarak aşağıdakilerden hangisi yanlıştır?

A) Beslenme çocuğun hem fiziksel hem de duygusal sağlığını etkiler.
B) Çocuklar bu dönemde besinleri karışık olarak tüketmekten hoşlanmazlar.
C) Çocuklar bu dönemde belli bir yiyeceği yemeyi kestiğinde aile panik olmamalıdır.
D) Öğünden bir saat önce büyük bir bardak süt veya meyve suyu vermek sindirimi kolaylaştırır.
E) Çocuk bir yemeği yediğinde ödül olarak zararlı atıştırmalıklar verilmemelidir.

14. Aşağıdakilerden hangisi okul öncesi çocukları yeni besinlerle tanıştırırken yapılacaklardan birisi değildir?

A) Çocukların yeni tattırılan yiyeceklerden hoşlanmaları zaman almamalıdır.
B) Yeni bir yiyecek denetilirken öğünlerde azar azar verilmelidir.
C) Yeni tattırılan besinler eğlenceli hale getirilerek sunulabilir.
D) Yemek istemediği sebzeler çorbanın içine katılıp yedirilebilir.
E) Yeni yiyecekleri yemeyi reddetmek bu çağdaki çocuklar için normal bir gelişim evresidir.

15. Aşağıdakilerden hangisi okul öncesi dönemindeki çocukların beslenmesiyle ilgili dikkat edilmesi gereken unsurlardan biri olamaz?

A) Çocuğun kendi kendine kaşık kullanması desteklenmelidir.
B) Çocuk, sevgi ve ilgiyle değil yemekle ödüllendirilmelidir.
C) Çocuk, aile sofrasına oturtularak kendi kendine yemek yeme alışkanlığını kazanmalıdır.
D) Çocuğun kendi tabağına, kendi servisini yapma olanağı sağlanmalıdır.
E) Çocuğa, yemek yeme saatleri ile televizyon ve oyun saatlerini ayırt etme davranışı kazandırılmalıdır.

16. Aşağıdakilerden hangisi sağlıklı bir ara öğün olarak okul öncesi çocuklara verilebilir?

A) Cips B) Pasta C) Kuruyemiş
D) Bisküvi E) Çikolata

17. Çocukların kendi başlarına yemek yiyememeleri kaç yaşa kadar normal kabul edilmelidir?

A) 3 B) 4 C) 5 D)6 E) 7

18. Genel olarak okul öncesi yaş grubu çocukları besin grupları içinde en az hangi besin grubunu severler?

A) sebze
B) meyve
C) et
D) süt ve süt ürünleri
E) yağlı ve şekerli gıdalar

19. Aşağıdaki seçeneklerden hangisinde okul öncesi çocuğunun beslenmesiyle ilgili doğru bilgi verilmiştir?

A) Et, bu yaşlarda büyük parçalar halinde tüketilemez.
B) Çocuklar, çiğ yenebilen sebzeleri pişmiş sebze yemeklerinden daha az tercih ederler.
C) Okul öncesi çocuğu genellikle besin seçici değildir.
D) Yemekle ilgili uyarılar çocuklar yemek yerken yapılmalıdır.
E) Sofra oyun alanı olarak görülmelidir.

20. Aşağıdaki öğünlerden hangisi okul öncesi çocuk beslenmesi için uygun değildir?

A) Yayla çorba, İzmir köfte, mandalina
B)Mercimek çorbası, biber dolması, havuç salata
C)Sebzeli tavuk, pirinç pilavı, cacık
D)Sebze çorbası, hamsi buğulama, portakal
E)Sosis kızartma, kızarmış patates, kola

APPENDIX D

CONTENT TEST IN ENGLISH

1. Which of the followings is <u>not correct?</u>

   A. Parents should give more food than children can eat.
   B. Parents shouldn't give unhealthy snacks as a reward.
   C. Children should eat at their own plate.
   D. Children should use spoon on their own.
   E. Parents should teach their children that eating is a need.

2. Which of the following is <u>correct</u>?

   A. Parents should warn their children about eating at dining table.
   B. Parent should reward their children with food.
   C. Children don't like mixing foods.
   D. Children should drink a glass of milk before eating
   E. Children shouldn't eat alone.

3. Which of the followings is a healthy snack?

   A. Crisps
   B. Cake
   C. Biscuits
   D. Chocolate
   E. Dried fruits

4. Which of the followings is <u>a processed food?</u>

   A. Cauliflower
   B. Strawberries
   C. Sausage
   D. Lentil
   E. Milk

5. Which of the followings do children like the least?

   A. Vegetable
   B. Fruit
   C. Meat
   D. Milk and dairy
   E. Foods with fat and sweet

6. Which of the following cooking types is more <u>unhealthy</u>?

   A. Frying
   B. Baking
   C. Grilling
   D. Poaching
   E. Boiling

7. Her mom says Taylor that she should eat organic foods. Which of the followings <u>shouldn't</u> Taylor eat?

   A. Egg
   B. Apple
   C. Butter
   D. Chocolate
   E. Cucumber

8. One of your relatives is sad because her children don't want to eat. What can be your advice?

   A. You should give hamburger and French fries to your kids all the time.
   B. You should put more salt and spice to the foods
   C. As a snack you should give sweets.
   D. Instead of pastry, you should give fruits.
   E. You should be panic.

9. Which of the followings is correct in introduction of new foods?

   A. Children must like the new food immediately.
   B. Parents should give the new food to the kids in big servings.
   C. New foods may be introduced with funny servings.
   D. It isn't normal for children to refuse eating new food.
   E. Parents should be angry when the children don't want to eat new foods.

10. Which of the followings about children nutrition is not correct?

   A. Children shouldn't eat meat in big pieces.
   B. Children prefer eating raw vegetable.
   C. Children generally don't eat everything.
   D. Dining table isn't a play area for the children.
   E. Parents should reward their children with love and affection.

APPENDIX E

FEEDBACK SHEET ON SCAFFOLDING FEATURES

Score each feature from 1 to 5 in accordance with their perceived efficiency. (The scale was translated into English by the researcher.)

	1	**2**	**3**	**4**	**5**
The picture dictionary					
Examining what constitutes some food					
Various representations of the food pyramid					
Shopping list					
Comparing different ways of cooking the same food					
To do list					
Salient food pyramid visual					

Aşağıdaki özellikleri ne derece faydalı bulduğunuzu 1-5 arası puanlayınız.

	1	**2**	**3**	**4**	**5**
Bilinmeyen sözcüklerin anlamını içeren resimli sözlük					
Bazı gıdaların içinde ne olduğunun incelenmesine imkan sağlanması					
Besin piramidinin farklı gösterimleri					
Alışveriş listesi					
Aynı gıdanın farklı pişirme yöntemlerinin kıyaslanması					
Görev listesi					
Besin piramidi görselinin ekranda bulunması					

APPENDIX F

REFLECTION QUESTIONS

Reflection questions asked midway

Aşağıdaki soruları bu haftaki dersleri düşünerek cevaplayınız.

(Please answer the questions below by taking into consideration of this week's lessons.)

1. Bu haftaki etkinliklerin en zor yanı nedir?

   (What are the most challenging aspects of this week's lessons?)
2. Bu haftaki etkinliklerin en eğlenceli yanı nedir?

   (What are the most enjoyable aspects of this week's lessons?)
3. Bu hafta neler öğrendiğini düşünüyorsun?

   (What do you think that you have learned so far?)
4. Etkinliklerle ilgili değiştirmek istediğin noktalar var mı? Varsa nelerdir?

   (Is there anything to change about the lessons? If so, what are those?

Reflection questions asked in the end

Aşağıdaki soruları bu çalışmadaki tüm dersleri düşünerek cevaplayınız.

(Please answer the questions below by taking into consideration of all the lessons.)

1. Çalışmayı genel olarak nasıl buldun?

   (How did you find the overall study?)

2. Bu çalışma İngilizce öğrenme motivasyonuna katkı sağladı mı? Eğer sağladıysa bu motivasyon artışının sebebinin ne olduğunu düşünüyorsun? *(Did the study contribute to your motivation to learn English? If so, what could be the reasons of the motivation increase?)*
3. Çalışmanın olumlu yanları nelerdir? *(What are the positive aspects of the study?)*
4. Çalışmanın olumsuz yanları nelerdir? *(What are the negative aspects of the study?)*

APPENDIX G

SYLLABI FOR EXPERIMENTAL AND CONTROL GROUPS

Table G1. Syllabus of Experimental Group

Weeks	**Date**	**Activities**
Week 1	April 19 (80min)	T explains the activities that Ss are going to complete and gives information about technology integrated CBI lessons. T forms groups both for the group works and the works that will be done on computers. Ss will take pretests.
Week 1 &2 (Food Pyramid)	April 24 (80 min) -- introductory reading on the computer	T states that Ss need to complete a pre training program and they will be accepted to the Comenius program based on the total quality of the work they produce individually and collectively in the next few weeks. T provides a list of things they will do (titles of books to read on the computer, food pyramid poster, daily meal plan, children's book, book fair presentation, etc) at the end of the unit, which will make up the evaluation portfolio. In addition to activities in line with CBI Ss will work on computers and Ss completes an introductory storyline on computers. This storyline includes information about the process and characters who will be a part of the story.
	May 3 (80min) --reading on the computer	T asks Ss to brainstorm about the food that children should and shouldn't eat and writes the vocabulary on the board. T shows a wordcloud (Appendix A) to the Ss and asks them to tell the words that they didn't include on their brainstorming maps. T asks the question: "How do we know which food to give a child?" T guides Ss to the food pyramid and T shows the picture of the food pyramid (Appendix B) and explains 6 food groups. While explaining T asks Ss to give examples for each level. T divides the class into 6 and asks Ss to prepare a food pyramid. T asks each group to choose a level to work on and gives a cardboard and explains that they should draw the foods and write about their level. At the same time, 6 students start to complete the first part of the activity on computer. When 6 Ss have finished the

		activity on computer other 6 Ss starts to complete the activity. This process is repeated until 23 Ss finishes the activity on computer. T asks Ss to record a video of an item that they draw on the relevant part of the food pyramid. Ss are expected to show an item from their part and pronounce it.
Week 3 (Child Nutrition)	May 8 (80 min) --reading on the computer	6 Ss start to do the second part of the activity on computer. T shows how to put Augmented Reality (AR) features to a Picture to the rest of the class and T explains that AR will be added to the food pyramid that they prepared yesterday by recording their presentations. When 6 Ss have finished the activity on computer other 6 Ss starts to complete the activity. T shows AR features to the Ss who weren't able to see because they were completing the reading on computer. When everyone finishes reading on the computer, Ss present their part on the pyramid and T records them.
	May 10 (80 min)	T divides the class into pairs and asks Ss to write 5 facts about children nutrition. When it is finished, T makes groups of 4 by combining pairs and asks them to compare their lists and explain why they choose these facts. Then T leads a whole class discussion about the topic. T introduces the book titled *Charlie and Lola: I will ever NEVER eat a tomato* and the characters in the book. T shows the cover of the book and asks the food the children may not like such as cabbage cauliflower T makes pairs and asks Ss to write 16 foods that Lola may not like. T asks why they choose these foods. While watching the video T asks Ss to write 16 foods and compare the two lists. T shows the video about the book. (https://www.youtube.com/watch?v=yDsfgkn-tLE) T asks how to give the food that the children don't want to eat. Then T makes 6 groups and Ss play the game as a group. http://www.gamesgirlgames.com/2015/11/charlie-and-lola-i-will-not-ever-never.html
Week 4(Daily meal plan)	May 15 (80 min) --reading on the computer	T divides the class into six groups and ask each group to prepare a dos and don'ts chart about child nutrition. For the ones who finish the reading on computer and preparing presentation early, T gives Ss the story of *Jack and the Hungry Giant* and asks them to read and find the foods that they think children don't like. Ss present the charts ans T record ss while presenting. Ss read the story called "*Ordering Food*" on computers in turn while completing the tasks above.
	May 17 (80 min)	T shows the table about what Carla ate for 3 days (Appendix C) and asks ss to comment on it. Ss brainstorm about Daily meal plan

		T divides the class into 6 groups and Ss play *Kevin's build balanced meals game* on the computer as groups http://www.nourishinteractive.com/kids/flash/games/build-a-meal/en/6-kevins-build-a-meal-game-balanced-meals After finishing the game, Ss talk about their mistakes and how to correct them. T asks Ss to create a daily meal plan for their neighbors' child who is 5 years old.
Week 5 (Back up)	May 22 (80 min) --reading on the computer	T Shows the pictures of the ingredients for the recipe and asks Ss to guess the meal and to talk about if it is good for a child or not and why. T shows the finished pictures of the recipe and says that it is banana bread. Ss watch the video of the recipe https://www.youtube.com/watchv=JMwlE_lrkEQ&feature=relmfu T asks Ss how to cook healthily. T asks Ss to write a short healthy recipe (individually) Ss do activity called *"At the kitchen"* on computers in turn while completing the tasks above.
	May 24 (80 min)	T summarizes the process and what Ss have completed for this unit. T reminds the Ss that the total quality of the work they produce individually and collectively so far will be analyzed in order to be accepted to the Comenius project. T reminds Ss that they will individually prepare a concept book about healthy and unhealthy foods for the kids on *Storybird Website* and they will prepare hard copy concept books for the kids as a group. T asks Ss to prepare a picture book individually about child nutrition on *Storybird*. 6Ss sit in front of the computers and starts writing their books. T divides the class into 6 and asks them to create a hardcopy concept book about healthy and unhealthy foods for kids. When 6 Ss have finished writing the story on computer other 6 Ss start to write. This process is repeated until 23 Ss finish the activity on computer.

Table G2. Syllabus of Control Group

Weeks	**Date**	**Activities**
Week 1	April 19 (80min)	T distributes pretests on the language mastery. After Ss complete the pretest, they start the unit on the student book. T asks Ss to look at the trolleys and choose the trolleys belong to a junk food addict, a veggie and a health freak. T asks Ss to state common characteristics of the people who buy the items on these trolleys. Then T asks Ss to match the items to the trolleys and then categorize these items into vegetables, fruits, meat, drinks, junk food and others. Then Ss move on the workbook and complete the sentences with the food words. T asks Ss to match the cooking verbs to the pictures. T asks Ss to draw a word map for each cooking method.
Week 1 &2	April 24 (80 min)	T asks Ss to match the cooking words with the pictures Then T states that Ss will read the dialogue between two people about making salad for dinner and answer the questions about the dialogue. T asks Ss to listen to a chef explaining how to make a chocolate muffin and to complete the ingredients. Ss listen to the recipe again and put the sentences into the correct order. T asks Ss to open the workbook and put the instruction for making a sandwich in the correct order.
	May 3 (80min)	Ss open student books and look at the pictures and decide where they go if they want to have pizza, tea or a good meal. T asks Ss to read the dialogue and write True or False to the sentences. T asks Ss to write a short recipe individually.
Week 3	May 8 (80 min)	T asks Ss to open student books and listen to Lisa ordering at a fast food restaurant and choose the correct option. They listen to the dialogue one more time and answer the comprehension questions. T moves on the work book and asks Ss to read the sentences and put them in the correct order. T asks Ss to complete the dialogue with the words.
	May 10 (80 min)	T asks Ss to look at the picture and guess the meaning of the word “globesity”.

		T asks Ss to look at the chart and put a tick to the correct sentences about the chart. T shows the sentences with the target structure *If Clause Type 1*. T asks Ss to guess the meaning of *If* and how it is used. T asks Ss to give more examples with *If*.
Week 4	May 15 (80 min)	T asks Ss to read the article on their student books and choose the main idea of the text. Ss read the text again and write True or False to the sentences. T asks Ss to complete the sentences starting with *If*.
	May 17 (80 min)	T asks Ss to open the workbook and read the text about Simon Moore and answer the questions about text. After that Ss join the two halves to form a sentence with *If* and then they complete the sentences starting with *If*. Next Ss put the verbs into the correct form on the sentences including *If*.
Week 5	May 22 (80 min)	T asks Ss how to give advice to someone and introduces the target structure *should/shouldn't.* T asks Ss to give more examples on giving and asking for advice. T shows the table about what Carla ate for 3 days (Appendix A) and asks Ss to comment on it by using the target structure.
	May 24 (80 min)	T asks Ss to prepare a story book about healthy and unhealthy food individually. Ss are supposed to write an outline first and T gives useful vocabulary before starting to write.

APPENDIX H

WRITING RUBRIC

Content **(5 pts)**	**Organization** **(5 pts)**	**Accuracy** **(5 pts)**	**Vocabulary** **(5 pts)**	**Spelling and Punctuation** **(5 pts)**
The writing is clear and relevant. (5 pts)	The writing is well planned and organized. (5 pts)	The writing is completely accurate. (5 pts)	The writing is full of different vocabulary use. (5 pts)	There is no spelling and punctuation mistakes. (5 pts)
The writing is nearly clear and relevant. (4 pts)	The writing is almost well planned and organized. (4 pts)	The writing is almost accurate. (4 pts)	The writing has a great deal of different vocabulary use. (4 pts)	There are few spelling and punctuation mistakes. (4 pts)
The writing is moderately clear and relevant. (3 pts)	The writing is moderately planned and organized. (3 pts)	The writing is moderately accurate. (3 pts)	The writing has a moderate amount of different vocabulary use. (3 pts)	There are average number of spelling and punctuation mistakes. (3 pts)
The writing is somewhat clear and clear. (2 pts)	The writing is somewhat planned and organized. (2 pts)	The writing is somewhat accurate. (2 pts)	The writing has different vocabulary use to some extent. (2 pts)	There are a lot of spelling and punctuation mistakes. (2 pts)
The writing is clear but not relevant. (1 pt)	The writing is not well organized. (1 pt)	The writing has many inaccurate usages. (1 pt)	The writing is repetitive in vocabulary use. (1 pt)	The writing is full of spelling and punctuation mistakes. (1 pt)

APPENDIX I

ORAL PRESENTATION RUBRIC

Category	5	4	3	2	1
Eye Contact	Always has eye contact with audience.	Most of the time has eye contact with the audience.	Sometimes has eye contact with the audience.	Has rarely eye contact with the audience.	Does not have eye contact with the audience.
Enthusiasm	Very enthusiastic about the topic during the presentation.	Most of the time enthusiastic about the topic during the presentation.	Sometimes enthusiastic about the topic during the presentation.	Rarely appears enthusiastic about the topic during the presentation.	Does not appear enthusiastic about the topic during the presentation.
Preparedness and Organization	Very prepared and organized during the presentation.	Most of the time prepared and organized during the presentation.	Somewhat prepared and organized for the presentation.	Rarely appears to have prepared for the presentation.	Does not appear to have prepared for the presentation.
Speaks Clearly	Speaks very clearly. Very easy for the audience to understand.	Most of the time speaks clearly. Easy for the audience to understand.	Sometimes speaks clearly. Sometimes easy for the audience to understand.	Rarely speaks clearly. Difficult for the audience to understand.	Does not speak clearly. Difficult for the audience to understand.
Knowledge of Content/Recycling	Knowledge of recycling is very clear. Student shows full understanding of content during presentation.	Knowledge of recycling is clear most of the time during the presentation.	Knowledge of recycling is sometimes evident during the presentation.	Knowledge of recycling is rarely evident during the presentation.	Knowledge of recycling in not clear. Student does not show understanding during presentation.

APPENDIX J

SPSS TEST RESULTS

Table J1. Normality Tests before Data Transformation

Tests of Normality

	Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
PRELangTest	Experimental group	,103	20	,200*	,981	20	,949
	Control group	,246	16	,010	,886	16	,048
POSTLangTest	Experimental group	,114	20	,200*	,972	20	,790
	Control group	,189	16	,131	,954	16	,552
PREContentEng	Experimental group	,270	20	,000	,867	20	,010
	Control group	,224	16	,031	,881	16	,040
POSTContentEng	Experimental group	,214	20	,017	,921	20	,102
	Control group	,218	16	,041	,898	16	,073
PREContentTR	Experimental group	,200	20	,035	,895	20	,033
	Control group	,192	16	,119	,934	16	,284
POSTContentTR	Experimental group	,157	20	,200*	,941	20	,248
	Control group	,240	16	,014	,908	16	,109
PREUnitExam	Experimental group	,204	20	,029	,835	20	,003
	Control group	,228	16	,026	,871	16	,028
POSTUnitExam	Experimental group	,209	20	,022	,861	20	,008
	Control group	,177	16	,196	,898	16	,073
WritingScores	Experimental group	,138	20	,200*	,923	20	,115
	Control group	,195	16	,106	,953	16	,547

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table J2. Normality Tests after Data Transformation

Tests of Normality

	Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
GainScores	Experimental group	,192	20	,051	,937	20	,208
	Control group	,230	16	,024	,916	16	,145
SquarePOSTContentTR	Experimental group	,150	20	,200*	,933	20	,178
	Control group	,182	16	,162	,941	16	,358
SquarePOSTLangTest	Experimental group	,106	20	,200*	,970	20	,750
	Control group	,217	16	,042	,925	16	,204

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table J3. Paired Samples T-test Statistics for the Parts of Language Test

	Paired Differences					t	*df*	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
PREVocab1 - POSTVocab1	-1.400	2.162	.483	-2.412	-.388	-2.896	19	.009
PREVocab2 - POSTVocab2	-1.850	2.007	.449	-2.789	-.911	-4.122	19	.001
PREGrammar - POSTGrammar	-1.650	2.110	.472	-2.637	-.663	-3.498	19	.002

Table J4. Wilcoxon Signed Rank Test Results of Experimental Group

	UnitExam
Total number	16
Test statistic	117.500
Standard Error	19.320
Standardized Test Statistic	2.56
Asymptotic Sig. (2-sided test)	.010

Table J5. Paired Samples Test Results of the Unit Exam for Control Group

	Paired Differences							
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
PreUnitExam - PostUnitExam	-7.406	11.046	2.761	-13.292	-1.520	-2.682	15	.017

Table J6. Wilcoxon Signed Rank Test Results of Both Groups

	Experimental Group	Control Group
Total number	20	16
Test statistic	210.000	33.000
Standard Error	26.196	10.926
Standardized Test Statistic	4.008	.000
Asymptotic Sig. (2-sided test)	.000	1.000

Table J7. Independent Samples T-test results for Pre Content Test in Turkish

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PreContentTR	Equal variances assumed	1.618	.212	4.678	34	.000	3.625	.775	2.050	5.200
	Equal variances not assumed			4.531	27.241	.000	3.625	.800	1.984	5.266

Table J8. T-test Results of the Content Test in Turkish for Groups

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Experimental Group	PreContTR PostContTR	-4.350	1.496	.335	-5.050	-3.650	-13,000	19	.000
Control Group	PreContTR PostContTR	-.938	2.516	.629	-2.278	-.403	-1.491	15	.157

APPENDIX K

AVERAGE SCORES

Table K1. Percentages of the Correct Answers on the E-books

	1	2	3	4
İlke	64.7	100	100	70
Didem	52.9	73.6	92.8	60
Gonca	76.4	100	92.8	80
Gaye	64.7	78.9	100	70
Asya	52.9	100	92.8	60
Gülten	76.4	84.2	100	70
Bilge	82.3	89.4	92.8	80
Emel	58.8	68.4	100	60
Seren	76.4	89.4	100	80
Ufuk	58.8	73.6	92.8	90
Fatma	70.5	78.9	100	70
Veli	76.4	84.2	85.7	80
Serdar	64.7	73.6	85.7	70
Özgür	70.5	100	100	80
İpek	70.5	78.9	85.7	90
Rabia	76.4	84.2	100	100
Defne	70.5	84.2	100	80
Tuğçe	58.8	68.4	92.8	70
Melis	64.7	73.6	100	70
Sare	70.5	94.7	100	70
Average	67.94118	83.94737	95.71429	75

Table K2. The Students' Scores on the Printed Concept Books

	Content	Organization	Accuracy	Vocabulary	Spelling and Punctuation	Total(25)
İlke	4	5	4	5	4	22
Didem	5	5	3	5	4	22
Gonca	5	5	3	5	3	21
Gaye	4	5	3	5	4	21
Asya	5	5	4	4	4	22
Gülten	5	5	4	5	4	23
Bilge	5	5	4	5	5	24
Emel	5	5	4	5	3	22
Seren	5	5	4	5	3	22
Ufuk	5	5	3	5	3	21
Fatma	5	5	3	5	3	21
Veli	5	5	4	5	3	22
Serdar	4.5	5	5	5	5	24,5
Özgür	5	5	3	4	3	20
İpek	4	4	3	4	4	19
Rabia	5	5	4	5	5	24
Defne	5	5	4	4	4	22
Tuğçe	4	5	3	5	2	19
Melis	5	5	3	5	3	21
Sare	5	5	4	5	3	22
Average						21,725

Table K3. The Students' Scores on The Online Concept Books-Storybird

	Content	Organization	Accuracy	Vocabulary	Spelling and Punctuation	Total(25)
İlke	5	5	1	4	1	16
Didem	5	5	4	4	1	19
Gonca	5	5	1	4	3	18
Gaye	3	5	1	4	1	14
Asya	5	5	2	4	1	17
Gülten	4	5	1	3	1	14
Bilge	5	5	3	5	1	19
Emel	5	5	1	4	1	16
Seren	4	5	1	4	1	15
Ufuk	5	5	1	3	1	15
Fatma	3	4	2	4	1	14
Veli	4	5	1	4	1	15
Serdar	4	5	3	3	1	16
Özgür	5	5	2	4	1	17
İpek	3	5	2	5	1	16
Rabia	5	5	3	3	3	19
Defne	5	5	1	5	1	17
Tuğçe	3	5	1	3	1	13
Melis	4	5	1	4	1	15
Sare	5	5	1	5	1	17
Average						16,1

Table K4. The Individual Scores of the Oral Presentation

	Eye Contact	Enthusiasm	Preparedness and Organization	Speaks clearly	Knowledge of Content	Total(25)
İlke	5	5	3	2	3	18
Didem	5	5	4	3	4	21
Gonca	5	5	5	5	5	25
Gaye	1	1	3	1	3	9
Asya	2	2	4	2	5	15
Gülten	5	5	4	4	5	23
Bilge	5	5	4	3	4	21
Emel	3	3	4	4	4	18
Seren	4	4	2	1	2	13
Ufuk	5	5	5	5	5	25
Fatma	5	5	4	3	3	20
Veli	2	4	5	4	4	19
Serdar	5	4	4	4	3	20
Özgür	2	3	2	2	2	11
İpek	5	5	4	4	4	22
Rabia	4	5	4	2	3	18
Defne	2	3	4	3	4	16
Tuğçe	3	4	4	2	3	16
Melis	4	5	4	2	2	17
Sare	5	5	4	4	3	21
Average						18,4

REFERENCES

Akyel, A., & Erçetin, G. (2009). Hypermedia reading strategies employed by advanced learners of English. *System, 37*(1), 136-152.

Alptekin, C., Erçetin, G., & Bayyurt, Y. (2007). The effectiveness of a theme-based syllabus for young L2 learners. *Journal of Multilingual and Multicultural Development, 28*(1), 1-17.

Arslan, R. Ş., & Şahin-Kızıl, A. (2010). How can the use of blog software facilitate the writing process of English language learners?. *Computer Assisted Language Learning, 23*(3), 183-197.

Asan, A. (2003). Computer technology awareness by elementary school teachers: A case study from Turkey. *Journal of Information Technology Education, 2*, 153-164.

Aydoğanlı, F. S. (2006). *Endüstri meslek liselerinde okutulmakta olan İngilizce ders kitabı ve haftalık ders saatlerine ilişkin öğrenci, öğretmen ve okul yöneticilerinin görüşleri üzerine bir araştırma.* (Unpublished master's dissertation). Gaziantep University, Gaziantep.

Bahçe, A., & Taşlacı, N. (2009). Learners' perception of blended writing class: Blog and face-to-face. *Turkish Online Journal of Distance Education, 10*(4).

Bereiter, C., & Scardamalia, M. (1993). *Surpassing ourselves: An inquiry into the nature and implications of expertise*. Chicago: Open Court.

Berk, L. E., & Winsler, A. (1995). *Scaffolding children's learning: Vygotsky and early childhood education.* Washington, DC: National Association for the Education of Young Children.

Brett, P. (1997). A comparative study of the effects of the use of multimedia on listening comprehension. *System, 25*(1), 39-53.

Brett, P. (2000). Developing cross-cultural competence in business through multimedia courseware. *ReCALL, 12*(02), 196-208.

Celce-Murcia, M., Brinton, D. M., Snow, M. A., & Bohlke, D. (2014). *Teaching English as a second or foreign language.* Boston: Heinle and Heinle.

Brinton, D., Snow, M., & Wesche, M. (1989). *Content-based second language instruction.* New York: Newbury House.

Bush, M. D., & Terry, R. M. (Eds.). (1997). *Technology-enhanced language learning*. Lincolnwood, IL: National Textbook Company.

Canbay, M. O. (2006). *Strengthening a content-based instruction curriculum by a needs analysis*. (Unpublished master's dissertation). Bilkent University, Ankara.

Carrel, P. L., & Carson, J. G (1997). Extensive and intensive reading in an EAP setting. *English for Specific Purposes, 16*(1), 47-60.

Chamot, A. U., & O'Malley, J. M. (1986). *A cognitive academic language learning approach: An ESL content-based curriculum.* Washington, DC: Office of Bilingual Education and Minority Languages Affairs.

Chapelle, C., & Jamieson, J. (2008). *Tips for teaching with CALL: Practical approaches to computer-assisted language learning.* USA: Pearson Education.

Chun, D. M., & Plass, J. L. (1996). Effects of multimedia annotations on vocabulary acquisition. *The Modern Language Journal, 80*(2), 183-198.

Coyle, D. (2006). Content and language integrated learning: motivating learners and teachers. *Scottish Languages Review, 13, 1-18.*

Coyle, D., Hood, P. & Marsh, D. (2010). *Content and language integrated learning*. Cambridge: Cambridge University Press.

Crandall, J. A. (1993). Content-centered language learning in the United States. *Annual Review of Applied Linguistics, 13*, 111-126.

Cummins, J. (1984). *Bilingualism and special education: Issues in assessment and pedagogy*. Clevedon, England: Multilingual matters.

Çelik, S. (2003). *Niğde Üniversitesi meslek yüksekokullarındaki büro yönetimi ve sekreterlik bölümü öğrencilerinin akademik ve mesleki İngilizce gereksinimlerine yönelik bir araştırma*. (Unpublished master's dissertation). Bilkent University, Ankara.

Diken, Ü. (2006). *Gereksinim çözümlemesi kullanılarak uygulanan özel amaçlı dil öğretimi.* (Unpublished master's dissertation). Süleyman Demirel University, Isparta.

Elola, I., & Oskoz, A. (2011). Writing between the lines: Acquiring the presentational mode through social tools. *Present and Future Promises of CALL: From Theory and Research to New Directions in Language Teaching*, 171-210.

Erçetin, G. (2011). Pedagogical issues in developing mobile assisted language learning materials. *Boğaziçi Üniversitesi Eğitim Dergisi, 28*(1).

Evans, M. (Ed.). (2011). *Foreign language learning with digital technology*. London: Continuum International Publishing Group

Mackey, A., Gass, S., & McDonough, K. (2000). How do learners perceive interactional feedback?. *Studies in Second Language Acquisition, 22*(4), 471-497.

Genesee, F. (1994). *Educating second language children: The whole child, the whole curriculum, the whole community.* New York: Cambridge University Press.

Gibbons, P. (2002). *Scaffolding language, scaffolding learning: Teaching second language learners in the mainstream classroom*. Portsmouth, NH: Heinemann.

Girgin, E. G. (2011). A web 2.0 tool for language teaching with flash content. *Procedia Computer Science*, 3, 627-631.

Grabe, W., & Stoller, F. L. (1997). Content-based instruction: Research foundations. In M. A. Snow, & D. M. Brinton (Eds.), *The content-based classroom: Perspectives on integrating language and content* (pp. 5-21). NY: Longman.

Gür, B. S., Özoğlu, M., Akgeyik, T., Çetimkaya, E., Karagöl, E. T., Öztürk, M., ... & Çelik, Z. (2012). *Türkiye'nin insan kaynağının belirlenmesi*. Ankara: Pelin Ofset.

Haley, M. H., & Austin, T. Y. (2013). *Content-based second language teaching and learning: An interactive approach*. Boston: Pearson Higher Ed.

Harmer, J. (2012). *The practice of English language teaching*. London: Pearson.

Horst, M., Cobb, T., & Nicolae, I. (2005). Expanding academic vocabulary with an interactive on-line database. *Language Learning & Technology,* 9(2), 90-110.

Hutchinson, T. & Waters, A. (1987). *English for specific purposes*. Cambridge: Cambridge University Press.

Işık, C., & Yılmaz, S. (2011). E-learning in life long education: A computational approach to determining listening comprehension ability. *Education and Information Technologies*, 16(1), 71-88.

İgrek, E. (2013). *İçerik tabanlı yabancı dil öğretim yaklaşımının mesleki yabancı dil (Ingilizce) derslerinde öğrencilerin akademik başarılarına etkisi.* (Unpublished master's dissertation). Gazi University, Ankara.

Kasper, L. F. (2000). The Internet and content-based college ESL instruction. *Content-based college ESL instruction*, 183-201

Kennedy, T. J. (2006). Making content connections online via the GLOBE Program. In E. Hanson-Smith & S. Rilling (Eds.), *Computers in the language classroom: From theory to practice.* Baltimore, MD: TESOL Publications.

Keranen, N., & Bayyurt, Y. (2006). Intercultural telecollaboration: In-service EFL teachers in Mexico and pre-service EFL teachers in Turkey. *Tesl-Ej, 10*(3), 1-50.

Kızıltan, N., & Ersanlı, C. Y. (2007). The contributions of theme-based CBI to Turkish young learners' language development in English. *Journal of Language and Linguistic Studies, 3*(1), 133-148.

Koçoglu, Z. (2010). WebQuests in EFL reading/writing classroom. *Procedia-Social and Behavioral Sciences,* 2(2), 3524-3527.

Koçoğlu, Z. (2012). Turkish EFL teachers' beliefs about the use of ICT in English language teaching. In Y. Bayyurt & Y. Bektaş-Çetinkaya (Eds.), *Research perspectives on teaching and learning English in Turkey: Policies and practices* (pp. 217-234). Frankfurt: Peter Lang.

Krashen, S. (1982). *Principles and practice in Second Language Acquisition*. Oxford: Pergamon Press.

Liaw, M. L., & English, K. (2017). Technologies for teaching and learning L2 reading. In C. A. Chapelle & S. Sauro (Eds.), *The handbook of technology and second language teaching and learning,* (pp. 62-76). Oxford: Wiley-Blackwell.

Lightbown, P. M. (2014). *Focus on content-based language teaching-Oxford key concepts for the language classroom*. Oxford: Oxford University Press.

Loewen, S. (2013). *Instructed second language acquisition*. New York, NY: Routledge.

Mariani, L. (1997). Teacher support and teacher challenge in promoting learner autonomy. *Perspectives: A Journal of TESOL Italy*, *23* (2), 1-9.

Master, P. (1997). Content-based instruction vs. ESP. *TESOL Matters*, *7*(6), 10.

Marsh, D., Mehisto, P., Wolff, D., Frigols Martin, M. J. (2010). *European framework for CLIL teacher education: A framework for the professional development of CLIL teachers.* Graz: European Centre for Modern Languages.

Met, M. (1999). *Content-based instruction: Defining terms, making decisions*. Washington, DC: The National Foreign Language Center.

Ministry of National Education (2014). *Vocational and technical education strategy paper and action plan 2014 – 2018*. Ankara: Author.

Nayar, P. B. (1997). ESL/EFL dichotomy today: Language politics or pragmatics? *TESOL Quarterly*, *31*(1), 9-37.

Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the horizon, 9*(5), 1-6.

Quintana, C., Reiser, B. J., Davis, E. A., Krajcik, J., Fretz, E., Duncan, R. G., ... & Soloway, E. (2004). A scaffolding design framework for software to support science inquiry. *The Journal of the Learning Sciences*, *13*(3), 337-386.

Reiser, B. J. (2004). Scaffolding complex learning: The mechanisms of structuring and problematizing student work. *The Journal of the Learning Sciences*, *13*(3), 273-304.

Rodgers, D. M. (2006). Developing content and form: Encouraging evidence from Italian content-based instruction. *The Modern Language Journal*, *90*(3), 373-386.

Sabuncuoğlu, A. (2010). *Meslek liselerinde özel amaçlı İngilizce öğretimine yönelik gereksinim çözümlemesi uygulaması*. (Unpublished master's dissertation). Ankara University, Ankara.

Sagarra, N., & Zapata, G. C. (2008). Blending classroom instruction with online homework: A study of student perceptions of computer-assisted L2 learning. *ReCALL*, 20(2), 208-224.

Sakar, A., & Ercetin, G. (2005). Effectiveness of hypermedia annotations for foreign language reading. *Journal of Computer Assisted Learning*, 21(1), 28-38.

Saran, M., Seferoglu, G., & Cagıltay, K. (2009). Mobile assisted language learning: English pronunciation at learners' fingertips. *Eurasian Journal of Educational Research (EJER)*, 34.

Satar, H., & Özdener, N. (2008). The effects of synchronous CMC on speaking proficiency and anxiety: Text versus voice chat. *The Modern Language Journal*, *92*(4), 595-613.

Sauro, S., & Chapelle, C. A. (2017). Toward Langua-technocultural Competence. In C. A. Chapelle & S. Sauro (Eds.), *The handbook of technology and second language teaching and learning*, (pp. 459-473). Malden: Wiley-Blackwell.

Schacter, J. (1999). *The impact of educational technology on student achievement: What the most current research has to say.* Santa Monica, CA: Milken Exchange on Educational Technology.

Seferoğlu, G. (2005). Improving students' pronunciation through accent reduction software. *British Journal of Educational Technology*, 36(2), 303-316.

Seferoğlu, G. (2007). The effects of synchronous computer mediated communication (SCMC) on English language learners' oral proficiency development. *Proceedings of the 6th WSEAS International Conference on E-ACTIVITIES, Spain, 371-375*.

Seikkula-Leino, J. (2007). CLIL learning: achievement levels and affective factors. *Language and Education*, 21(4), 328–41.

Sevingil, E. (2012). E-mail exchanges for language learning. In Y. Bayyurt & Y. Bektaş-Çetinkaya (Eds.), *Research perspectives on teaching and learning English in Turkey: Policies and practices* (pp. 217-234). Frankfurt: Peter Lang.

Short, D.J. (1991). *How to integrate language and content instruction: A raining manual*. Washington, DC: Center for Applied Linguistics.

Snow, M. A., & Brinton, D. M. (1988). Content-based language instruction: Investigating the effectiveness of the adjunct model. *TESOL Quarterly*, 553-574.

Snow, M. A., & Brinton, D. (Eds.). (1997). *The content-based classroom: Perspectives on integrating language and content.* White Plains, NY: Longman.

Snow, M. A., Met, M., & Genesee, F. (1989). A conceptual framework for the integration of language and content in second/foreign language instruction. *Tesol Quarterly*, 23(2), 201-217.

Sorani, D., & Tamponi, A. (1992). A cognitive approach to content-based instruction. *English Teaching Forum,* 30(2), 6-9.

Stoller, F. L., & Grabe, W. (1997). A six-T's approach to content-based instruction. In M. A. Snow & D. M. Brinton (Eds.), *The content-based classroom: Perspectives on integrating language and content*, (pp. 78-94). White Plains, NY: Longman.

Stryker, S. B., & Leaver, B. L. (Eds.). (1997). *Content-based instruction in foreign language education: Models and methods*. Washington, DC: Georgetown University Press.

Swain, M. (1985). Communicative competence: Some roles of comprehensible input and comprehensible output in its development. In S. M. Gass & C. G. Madden (Eds.), *Input in Second Language Acquisition* (pp. 235-253). Rowley, MA: Newbury House.

Şimşek, O. (2009). The effect of weblog integrated writing instruction on primary school students writing performance. *International Journal of Instruction*, 2(2), 31-46.

Thomas, M. (Ed.). (2009). *Handbook of research on Web 2.0 and second language learning.* USA: IGI Global.

Toth, S. (2010). *Oral presentation rubric.* Retrieved from https://wvde.state.wv.us/teach21/documents/OralPresentationRubric-Primary_000.doc

Tozcu, A., & Coady, J. (2004). Successful learning of frequent vocabulary through CALL also benefits reading comprehension and speed. *Computer assisted language learning*, *17*(5), 473-495.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Wesche, M., and Skehan, P. (2002). Communicative teaching, content-based instruction, and task-based learning, In R. Kaplan (Ed.), *Handbook of applied linguistics*, Oxford: Oxford University Press.

Yalçın, Ş. (2012). Content-based instruction at the tertiary level in Turkey. In Y. Bayyurt & Y. Bektaş-Çetinkaya (Eds.), *Research perspectives on teaching and learning English in Turkey: Policies and practices* (pp. 217-234). Frankfurt: Peter Lang.

Yalçın, Ş. (2013). İçerik temelli yabancı dil öğretim modeli. *Boğaziçi University Journal of Education*, *30*(2), 107-122.

Yıldız, S. & Tatar, S. (2012). The use of multimedia computers in Turkish classrooms: Perceptions of foreign language teachers. In Y. Bayyurt & Y. Bektaş-Çetinkaya (Eds.), *Research perspectives on teaching and learning English in Turkey: Policies and practices* (pp. 253-271). Frankfurt: Peter Lang.

Yoshii, M., & Flaitz, J. (2002). Second language incidental vocabulary retention: The effect of text and picture annotation types. *CALICO journal*, 33-58.

Zhang, M., & Quintana, C. (2012). Scaffolding strategies for supporting middle school students' online inquiry processes. *Computers & Education*, *58*(1), 181-196.