

Design, Development and Implementation of a Web-Based Support Material for English as Second Language

Levent Durdu ¹

M. Yaşar Özden ²

Ömer Delialioğlu ³

Abstract

Language learning, especially second language learning requires systematic practice and repetition. Students are introduced with the new words in class sessions and they practice them via traditional methods such as continuously writing the direct meaning of the word or using flash cards. Computers have the potential to bring more attractive and enjoyable features to instructional materials. This case study tries to contribute to the understanding of design, development and implication phases of computer-assisted language learning materials. Quantitative and qualitative methods were used. With regard to the dictionary page most of the students preferred to listen to the pronunciation of most of the words, but conflictingly almost none of the students tried to repeat the pronunciation of the words after listening. More than half of the students (72.7%) thought that practicing by doing activities (crossword puzzles) and interacting with the web based tool was joyful. The pace and understandability of its speech were positively perceived by the students. Technology like Ms-Agent can be useful especially for improving listening. Moreover, it can be used as an online assistant as students perceived the internet character as functional in guiding them.

Key Words: Computer assisted language learning; technology integration; interactive learning environments; computer-assisted instruction; web-based instruction

¹ Yrd. Doç. Dr. , Kocaeli Üniversitesi, Kocaeli Üniversitesi, Eğitim Fakültesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü, levent.durdu@kocaeli.edu.tr

² Prof. Dr., Orta Doğu Teknik, Eğitim Fakültesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü, myozden@metu.edu.tr

³ Yrd. Doç. Dr. , Orta Doğu Teknik, Eğitim Fakültesi, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü, delialioğlu@gmail.com

1. Introduction

The first applications of computer-assisted instruction were in the form of programmed instruction. Programmed instruction could be considered as the grandfather of the learning theory applications in computer environments. The studies of the B.F. Skinner were the most interesting studies which were ground on behaviorist theory and guided many researchers in the instructional technology field. In 1970's with the rise of more humanistic learning theories and methods, research focused more deeply on language learning and teaching and the needs of the individual learners, their emotions and feelings. Nunan (1988, cited in Cecchetto and Stroinska, 1989) pointed to this movement by stating that in 1970's there was a tendency from teacher centered to learner centered methodology. Especially the "individualization of the learning process" became the focus point in language learning (Cecchetto and Stroinska, 1989). Moreover, communicative language teaching emerged in those years (Hoven, 1999). After the development of microcomputers in 1973, special interest in Computer Assisted Language Learning (CALL) increased and software for CALL were produced.

The starting point of CALL can be traced to the Programmed Logic for Automatic Teaching Operations (PLATO) project initiated at the University of Illinois in 1960 (Levy, 1997; Ahmad, Corbett, Rogers and Sussex, 1989). PLATO aimed to provide interactive materials and let the learners work and learn in their own pace. It contained a simple e-mail system that the learners used to post messages to the teacher. This system provided communication opportunities for teacher and learners. Moreover, in the PLATO learner activities and information could be recorded. Reading, writing and listening activities and materials were within the focus of CALL.

Another great project started in 1971 was the Time-shared, Interactive, Computer Controlled Information Television (TICCIT). It was designed to use television and computer technologies together. It could be thought as the first multimedia courseware example that combined text, audio and video. In later versions of TICCIT, which was named MicroTICCIT, learners were able to choose the context and the presentation of content. Learner control became more important in MicroTICCIT. This was the main advance making it different from the PLATO.

In early 1980's microcomputers became widespread and cheap, therefore teacher-programmers started to produce CALL software especially using BASIC programming language. Storyboard, which was written by John Higgins, was well-known software of the 1980s. It aimed to reconstruct a text from a wide range of clues such as introductory materials and textual clues. In 1983, an eight -year research called Project Athena was established by the Massachusetts Institute of Technology (MIT) with funding of \$50 million dollars. Within this project Athena Language Learning Project (ALLP) was established and mainly concentrated on creation of communication-based prototypes for various courses such as French, German and English as a Second Language. ALLP consisted of multimedia

authoring environments, hypertext and hypermedia systems, artificial intelligence techniques and simulations as language learning materials.

In 1990's internet had become the most important technologic development that brought many features with it. With the rapid development of internet, multimedia materials such as text, sound and video became widely used. CALL projects also started to use internet in different ways. Computer-Aided Multimedia Interactive Language Learning (CAMILLE) was started by participation of France, Spain, Netherlands and UK. The main purpose of the project was to give basic courses for Spanish and Dutch, and advanced courses in English and French. In CAMILLE project the learning environment was in the center of the design. Learning was more important than teaching and it provided tools to facilitate learning. These tools included learning activities, pronunciation of the words spoken by a native speaker in a dictionary, audio and video recordings and etc.

A similar project was Oral Language Archive (OLA), started in 1994 at Carnegie Mellon University. Primary purpose of this project was to provide digitized sound recordings for foreign language learning over the internet. French, German, Japanese, Russian, Spanish were the main languages included in the project.

Today, computers play a great role in creating activities and practice environments to learners. Gillespie and McKee (1999) suggested that if computer programs are going to be used within a computer based learning environment, they should concentrate on specific language skills, especially which can be helpful to develop language awareness such as translation and vocabulary acquisition. Teachers use classroom activities, games and role playing activities to facilitate classroom instruction. When the teacher's role changes to facilitator (Higgins and Johns, 1984) or advisor in a multimedia environment (Liu, Moore, Graham, & Lee, 2003), it is important for the teacher to create attractive, interesting and enjoyable learning environments where students motivated to learn a language. Jones and Fortescue (1991) expressed that computerized activity is different from the non-computer version. It is obvious that attractive exercises get attention of the students. However, it shouldn't be forgotten that while creating activities for the students, the objective of the exercise must be clear in teacher's mind. Guberman (1989) concluded that students should be guided to produce meaningful sentences and messages. He stated that it is necessary for the students to completely focus on the gist of the exercise that is meaning and spelling of terms. Therefore, teacher should prepare activities that are focusing on the desired language skills. Besides, students should be aware of what are they doing (Bayyurt & Kitaplı, 1999), as Şire (1999) found that successful students aware of their responsibilities and have a tendency to practice English.

Hypermedia/multimedia technologies can support more appropriate context for students in terms of experiencing in the target language. Communication is the key concept in teaching and learning a foreign language (Wilkins, 1974). Communication of meaning is at the heart of language learning (Elyıldırım, 1999), so most of the foreign language teaching/learning strategies depend on communicative basics. American Council on the Teaching of Foreign Languages (ACTFL, 1999) states the importance of communication in their report named Standards for Foreign Language Learning by saying that

“communication is at the heart of second language study, whether the communication takes place face-to-face, in writing, or across centuries through the reading of literature.” (p. 2). Report continues with explanations to communication standards with several examples. First standard is concerned mainly with the learners’ interpersonal communication skills with whom they are in personal contact.

Cecchetto and Stoinska (1989) compared the communication in classroom environment with the computer environment for second language learning. While they pointed on some positive attributes of classroom environment like the learners being more motivated to be successful because of the competition with their peers, they also will get higher marks. However, they also stated that sometimes this type of tension became a stress for the learners. In such situations, students won’t respond. For the students who feel freeze in front of the teacher, computers create an ideal environment. Liu, Moore, Graham and Lee (2003) also support this idea by saying that CMC provides students equal chance of participation when compared with classroom environment or face-to-face activities. Therefore, computer environment can be thought as an ideal environment for the students to express their ideas without anxiety, and with equal chance of participation when compared with classroom environment. When reviewing for CALL studies on negotiation of meaning, Toyoda and Harrison (2002) pointed the advantage of saved communication logs that can be in class learning materials. Moreover, these logs can be precious resources for enhancement of the learners’ inter-language (Blake, 2000).

Stickler and Emke (2011) published an article which presents results of a project funded by the European Union. LITERALIA (Learning in Tandem to Encourage Reciprocal Autonomous Learning in Adults) project aimed to connect adult language learners from four countries to via using an online learning environment between 2006 and 2008. To achieve the project aim an online platform (Moodle) was set up so that learners can interact with each other to support their intercultural, social and learning competence. The learning environment included five chatrooms (four in target language, one is mixed) to allow synchronous written communication.

Courtright and Wesolek (2001) gave a great value to pronunciation of the new words learned by all levels but especially by elementary level learners. They emphasized that when vocabulary instruction is concerned; showing the relation between the new word learnt and the pronunciation of the word is very considerable for language learning. They concluded that for a good vocabulary acquisition it is important to give an opportunity for learners to hear when they see new vocabulary.

Godwin-Jones (2008) investigated the trends and emerging technologies considering language learning. He stated that with web 2.0, especially considering blogs and social networking sites, has potential to provide writing online. Therefore, according to him web 2.0 enabled language learners to practice reading and writing culture which develops language skills. He listed other services and language tools as automated assessment, participation to online sites, self-assessment techniques, and so on. It is important to note that nearly all of the examples Godwin-Jones provided were about reading and writing skills and evaluation of these skills. Listening and pronunciation skills were not focused as

much as others. Another example is the study of Stepp-Greany (2002) which investigated and reported that more writing/reading/listening studies than speaking/pronunciation studies. A previous meta-analysis study investigated the published papers based on their content in order to reveal which skills were focused. Zhao (2003) in his/her meta-analysis reported a summary table of technology and content of studies. The nine studies focused by Zhao investigated vocabulary (2), culture (3), grammar (1) and listening and speaking (2) as the main content. Although Zhao's study didn't indicate an unbalanced distribution Liu, Moore, Graham and Lee (2003) indicated that listening and speaking studies should be given more emphasis. According to Liu et al. there were several software tools available which are aiming to support specific skill acquisition. Researchers investigated software which mostly focused on reading and writing skills. However, "the literature seems to indicate that the greatest need for software development is in the areas of listening and speaking, because these two areas were found to be sparsely represented." (p. 253).

"The use of technology, specifically multimedia, for foreign language instruction has expanded rapidly in the United States during the last two decades" (Stepp-Greany, 2002, p.165). With the increasing number of studies related with technology use in language learning directed some authors to propose articles about how to utilize technology. For example, Plass and Jones' (2005, cited in Jones, 2008) proposed an integrated model of second language acquisition with multimedia. The model combines aural input with along with written and/or pictorial information. Their focus was to enhance aural comprehension.

"In recent years computer-mediated communication (CMC) technologies have begun to play an increasingly important role in the teaching of foreign/second (L2) languages" (Lafford & Lafford, 2005, p.679). The research on language learning, especially second language learning/acquisition, with technology after 2000 focuses on synchronous computer mediated communication (SCMC), web 2.0 and 3D learning environments. This focus actually shows the shift from behaviorist perspective to generative theories (Sotillo, 2005). On the other hand, research studies that focus on computer mediated communication mainly focused on writing and grammar skills. For example the study conducted by Elola and Oskoz (2010) investigated students' performance on writing and grammar skills in a collaborative chat environment.

Using speech technologies for language learning is a new and promising area. Specifically, text-to-speech (TTS), in other words generating speech from text input, offers a spoken language to learners in CALL environment. TTS has many benefits for teachers, learners and developers as ease of creation, editing, generation of speech models and use areas as taking dictionaries, talking texts, dictation, pronunciation (Handley, 2009). Godwin-Jones (2009) reported an analysis about speech tools and related technologies. He stated that "there has been significant progress in projects using speech technologies for teaching pronunciation and speaking" (p.4). Tanner and Landon (2009) directly used the term Computer-Aided Pronunciation (CAP) (see also Warren, Elgort & Crabbe, 2009) to describe pronunciation produced by computers, accessing and evaluating pronunciation performance through visual displays and analysis, immediate feedback mechanisms (including the software that are requiring teacher interpretation). In their study, Hew and

Ohki (2004) provided an environment called JCALL for students which enable students to listen to the pronunciation of a native speaker and simultaneously view a representation of that pronunciation for Japanese. They concluded that immediate visual feedback helped students to improve their pronunciation. Handley (2009) expressed that text-to-speech technologies could be used as a pronunciation model in exercises. Handley gave examples of such uses as SAFexo and Breton.

Rickenberg and Reeves (2000) studied on animated characters on anxiety, task performance and evaluations of user interfaces. They conducted their research in three dimensions: "no character, a character that ignored the user and a character that closely monitored work on the web site" (p. 49). They used Microsoft Agent technology for their study. Their study showed that animated character that monitors the users closely, users feel anxious and their performance was decreased when compared to no character and character that ignored the user. Study also described that users with high internal locus of control showed significantly less anxiety, more performance than users with high external locus of control. Besides all, their study relies on animated character's directly watching the user actions and recording the user interactions. They concluded their research with a soft conclusion that it is the character's actions such as "what it does, what it says and how it presents itself" (p. 55) that has effect on user behavior.

Language learning, especially second language learning requires systematic practice and repetition. Jones (2008) categorizes such learning strategies as typical approaches of the late 19th and early 20th centuries. Students learn the new words in class sessions and they practice what they learn by traditional methods such as continuously writing the direct meaning of the word or using flash cards. On the other hand, today's children were born into a world with computers. They are familiar with them and like playing and working with them. Computers have the potential to bring more attractive and enjoyable features to instructional materials. As a result of this potential, computers started to take part in educational systems since a long time now. At the beginning, academic studies mainly concentrated on whether to use computers or not. But with time the focus of research studies shifted towards the effective uses of computers, different uses of computer applications, and the conditions where the use of computers.

Özdemir (2001) expressed that 'Computer Assisted Language Learning programs with an educational basis can effectively complement and sometimes replace traditional language teaching techniques' (p.7). Therefore, it is significant to investigate in which conditions the use of computers and internet are valuable in the context of teaching and learning English as a second language.

In their implications for future research Liu, Moore, Graham and Lee (2003) gave several suggestions. They indicated that most of the studies focused on anxiety, attitudes and most of them try to explore reading and writing skills. However, there is a need for the investigation of less-explored skills which are speaking and listening. They indicated that although speech recognition with computers has some problems with the available technology, computers can be effectively used in improving listening skill. They also continue to recommend that studies should focus on specially K-12 level, because most of

the literature interested with higher grade levels. The K-12 level problem was also underlined by Zhao (2003) as “technology is underutilized in classrooms. The finding that none of the studies found in the major language education and technology journals is about technology use in K-12 classrooms is shocking” (p.22). Therefore, especially second language acquisition studies should study at K-12 level.

The purpose of this study is to contribute to the understanding of design, development and implication phases of computer-assisted language learning materials. Design, development and implication phases of the study explained in detail with planned web page development processes so that the reason why a page was needed and how it was developed could be understood. This can be valuable information for those planning to create web based learning environments especially for young learners and language learning.

Moreover, the study focuses on especially listening skills on all pages. Therefore this study can contribute, in terms of students’ perceptions, how to use dictionary pages with listening options, how to design activity pages with guidance and how to benefit from chat environments that allow listening to the written text. Moreover, students’ perceptions’ about the roles and the assigned functions of the animated character used in this study can be another contribution to the field. Specifically, this study tries to find answers for the following main questions:

1. What are the students’ perceptions about the web-based learning tool?
2. What problems did students face during the use of the web-based learning tool and how could the tool be improved?
3. What are the students’ perceptions about the animated character used in the web-based learning tool?

2.Method

2.1. Research design

This study is a case study. The purpose of employing case study is to “gain an in-depth understanding of the situation and meaning for those involved. The interest is in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation.” (Merriam, 1998, p. 19). In other words, this study tries to understand students’ interactions and experiences with the web-based learning tool in the form of perception statements in their natural context.

Quantitative and qualitative methods were used to analyze and interpret data to get answers for the research questions of the study. Quantitative methods in terms of frequency count and percentiles were used to understand (i) students’ attitudes towards computers, (ii) their perceptions about the web-based learning tool, and (iii) their perceptions about the animated Merlin character. Qualitative methods in the form of content analysis were used to understand (iv) students’ perceptions about the problems of the web-based tool and how it could be improved.

2.2. Sample

The subjects of the study were 8th grade students attending a private secondary school in Turkey. An English as second language class was selected for implementation of the web-based tool. The students' native language was Turkish. The subjects of the study were a total of 22 secondary education students consisting of 12 female (45%) and 10 male (45%) students. Most of the students stated that they had previous experience with computers more than one year. In the beginning of the study through an introductory part in the 'perceptions about the web-based learning tool questionnaire' the subjects were asked about their previous computer skills and whether they had attended out of school training programs on computers. The findings showed that most of the students and the teacher participating in the study had the necessary basic five computer skills listed by Kataoka (2000) as necessary to successfully utilize CALL. The students, in their primary school years, took computers courses. The computer teacher of the school expressed that in their college students took computer courses which aims to teach basic information and communication technologies including how to use operating system and office applications.

2.3. The design and development of the web based tool

The most known instructional design models are Dick and Carey Model, ADDIE Model, Kemp Model and ASSURE Model (Gustafson & Branch, 2002; McGriff, 2001). The development of the web-based tool adapted the ADDIE model. ADDIE stands for Analysis, Design, Development, Implementation, and Evaluation of learning materials and activities (McGriff, 2000). ADDIE is the most generic and simplified model of all which bases many of other models (Şener Bilgiç, 2005). Arkün, Baş, Avcı, Çevik and Gürcan (2009) explains the phases of ADDIE as: Analysis includes needs assessment, design includes determining learning activities and specifying media, developing includes preparing instructional materials, implementation includes bringing learner and the instructional materials together and finally evaluation includes formative and summative evaluation. In this research summative evaluation that is evaluating the overall worth of instruction was done based on students' perceptions rather than test-based scores. The development phases of web based tool are explained below.

The web-based tool was designed and developed based on the needs stated by the content area teacher and requirements of the English course. Two group of people worked in the design, development and implementation phases, (i) the content providers (two teachers), and (ii) the developer (design and coding). In the design phase two meetings were conducted with the content area teacher and the computer teacher. Based on the findings of Kidd (1989) who stated that "in order to produce effective programs teachers must involve in the creation and development stages of the production" (p. 70) the content area teacher and the computer teacher played active roles in especially the design and implementation phases. The first meeting was about the requirements of the course and on deciding about

the general site design features. In the meeting, the MS-Agent technology and its properties were explained by the developer to the teachers. The teachers and the developer discussed about the possible advantages that could be possibly used to support students' learning. As a result of these meeting, the teachers and the developer decided on specific features of the MS-Agent technology that will be integrated into the web-based learning tool. Overall, the decision was to use most of these features basically for pronunciation of the words in dictionary page and to give the students an opportunity to hear what they write in the chat page.

After the developer had designed and coded the first version of the web-based learning tool the second meeting was held. The content area teacher examined and used the tool for formative evaluation. According to her criticisms and requests regarding the tool, the developer made the required modifications and finalized the web-based learning tool. The final tool had three main pages for three different pedagogical reasons. (i) The dictionary page for vocabulary learning and listening acquisition. (ii) The activity page for interactivity and engagement. (iii) The chat page for online communication. In all of these pages the animated 'Merlin' character was integrated to provide opportunity to students for hearing the new words either integrated to the activity in the activity page or presented in the dictionary page. The Merlin character was also used for guiding the students' through the activities and providing animations to increase the joy of using the tool, and overcoming the feeling of boredom. The three main parts of the web based tool are provided and explained below. The design and development phases are summarized in Figure.1.

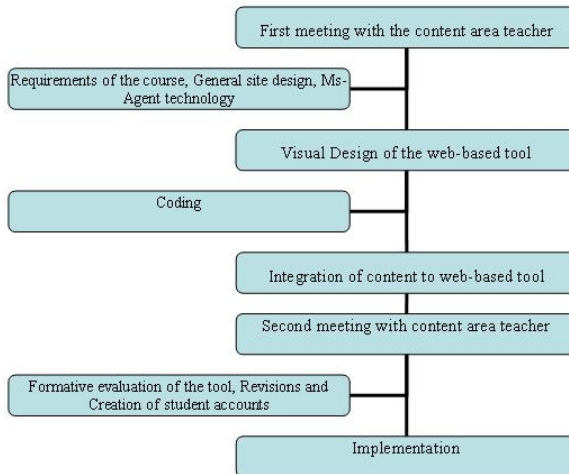


Figure 1. Design and development of the web-based tool

The dictionary page. The dictionary page was developed to present the English meaning of a word in the chapter taught. In the design phase of the page the subject area teacher did not request any visual elements like animations or pictures for the new words presented in the chapter. She claimed that the grade level and age of the students were high enough to understand and interpret textual coded information in the form of written words. As a result of this request in the dictionary page only written explanations of the new words were presented without pictures or animations. Another request of the subject area teacher in the design phase was to develop an environment that could give students the ability to hear the pronunciation of each word the students would see or use while using the web-based tool. As a result the animated MS-Agent character was integrated to the dictionary page and the students could read the explanations and hear the pronunciations of the new words from 'Merlin'. By simply using a 'Pronounce' button on the page Merlin was made to read the word. Figure 2 shows a sample page of the dictionary page and the Merlin character.

Words	Explanation	Pronounce
ADMIT	to accept	<input type="button" value="Pronounce"/>
BEAT	to defeat your opponent	<input type="button" value="Pronounce"/>
EARN	to g BEAT	<input type="button" value="Pronounce"/>
EVIL	bad	<input type="button" value="Pronounce"/>
FAMOUS	known by a lot of people	<input type="button" value="Pronounce"/>
FAN	the person who likes/admires a particular thing or person	<input type="button" value="Pronounce"/>
GAIN	to get something of value or valuable	<input type="button" value="Pronounce"/>
PICK	to choose	<input type="button" value="Pronounce"/>

Figure 2. Dictionary page of the web-based learning tool.

The activities page: The activities page consisted of crossword puzzle games. The subject area teacher expressed in the meetings that for vocabulary learning practicing and repeating is necessary and very important. There was a need for an environment where the students could practice the new words and could interact with the content in the web-based environment. In the activities page students could practice on the new words by working on a crossword puzzle. Three crossword puzzles were created, each of one consisting of an average of five words. Figure 3 shows a sample crossword puzzle from the activities page.

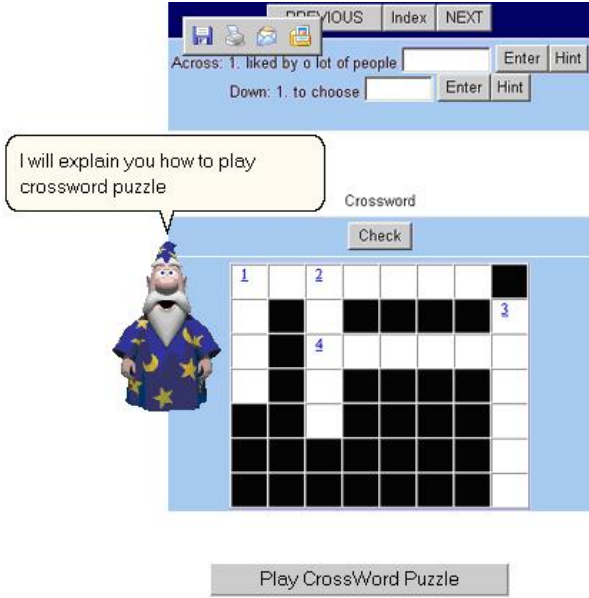


Figure 3. Activities page of the web-based learning tool.

The chat page: In order to create a social environment and to be able to see students' instant writings skills a chat page was developed. It was also considered that an online communication environment might be supportive for students learning. The teacher wanted to use the chat environment to see if students' could use vocabulary presented in the chapter in an appropriate and correct way. Another expectation of the development team for including the chat page was that some of the students might participate to discussions more and easier than they would do in the class environment. Figure 4 shows the chat page. Such a chat environment that more than two participants attend at the same time is named as "chat room" (Lafford & Lafford, 2005, p.690). In the designed chat environment students could able to hear each other writings via Microsoft Agent text to speech engine.



Figure 4. Chat page of the web-based learning tool.

Microsoft agent (MS-Agent): Microsoft Agent technology is defined as “a software technology that enables an enriched form of user interaction that can make using and learning to use a computer, easier and more natural” (Microsoft Agent Home, 2003, ¶ 1). By using MS-Agent technology animated characters could be embedded into applications such as web pages. These animated characters can speak (text-to-speech engine) and also accept spoken commands (speech recognition). Official Microsoft Agent site clearly states that developing and using MS-Agent is totally free (Microsoft Agent Home, 2003).

2.4. Data collection instruments

To collect data that could yield answers to the research questions two instruments were used; (i) the Computer Attitude Scale (CAS) for students’ attitudes towards computer and (ii) Perceptions about the Web-based learning tool questionnaire for students’ perceptions.

Computer attitude scale (CAS). CAS was developed by Loyd and Gressard (1984) and consisted of 40 questions with four scaled likert-type. It consisted of four sub-scales, each consisting of 10 items, namely a) confidence, b) liking, c) anxiety, d) usefulness (Knezek and Christensen, 2000). Berberoğlu and Çalıköğlü (1992) translated the CAS into Turkish and found the reliability coefficient alpha to be 0.90. For this study, the reliability coefficient alpha was found to be 0.90 too.

Perceptions about the web-based learning tool questionnaire. The questionnaire consisted of four main categories, namely a) dictionary page, b) activities page, c) chat page, and d) MS-Agent character. MS-Agent character related questions consisted of three sub-categories a) aesthetic b) speech of the character, and c) functionality. Initially the questionnaire consisted of 30 items. The questionnaire was investigated by one measurement and evaluation expert and two subject area experts to assure its accuracy, clarity and validity. Based on the criticisms and corrections of them 6 items were dropped. The final questionnaire had 24 five scaled likert type items, where 5 representing 'strongly agree' and 1 representing 'strongly disagree'. The Cronbach's alpha reliability coefficient of the of the 24 likert type five scaled items was 0.87 indicating that the instrument was reliable. In the questionnaire there were also two open ended questions for each of the four categories. The first question asked whether the students had faced any problems while using specific pages of the tool. The second question asked what other features they would like to see in the specific pages of the tool.

2.5. Procedures of the study

A web-based learning tool (supplementary web-site) specifically for the English as a second language course offered to secondary school students at 8th grade was designed and developed. The web-based learning tool was used during two laboratory sessions of "Superstars" chapter of the course. While all of the content presented in the tool was provided by the content provider (English teacher), the web-based environment was coded and developed by the developer.

The English course was carried out with eight class hours and one laboratory hour in a week for a chapter. Lecture sessions were carried out in the classroom settings with mostly traditional methods. Laboratory sessions were carried out for providing students an opportunity to practice the content of the chapter and to create an attractive learning environment. For the English language teachers of the school, it was not obligatory to conduct laboratory sessions. The teacher decides on whether to use laboratory activities or not. In the specific laboratory sessions while implementing the web based learning tool the English teacher and one computer teacher were present to help students in case they would face any problems with the content presented or some technical problems.

In the beginning of the semester CAS was applied to the subjects to understand their attitudes towards computers. After the subjects had used the web based tool to acquire the content covered, Perceptions about the Web-based learning tool questionnaire was administered. Quantitative and qualitative methods were used to analyze the data.

3. Findings

The findings are provided separately for each research questions of the study. In the first part, findings on the first research question, which investigates students' perceptions about the web-based tool, are presented. Since each page has different pedagogical aims for students' English learning the findings are grouped according to perception on different

pages present in the web-based tool. In the second part second research question, which focuses on problems the students' have faced while using the tool are presented. This part also includes suggestions of students for improving the tool. In the last part, findings about students' perception specifically about the animated character and its specifications are presented.

3.1. Students' initial attitudes towards computers

Since the study basically focuses on students perceptions, the authors have agreed that providing students preliminary or initial attitude towards computers might be helpful for the reader in interpreting the results. Therefore, before the findings on specific research questions are presented, the findings for the Computer Attitude Scale are presented. The CAS indicated that most of the students had positive attitudes towards computers. Nearly all of the students liked computers and they were confident with using computers. Most of the students thought that computer were useful tools. Most of the students' attitudes towards computers were positive. Table 1 shows the results obtained from the CAS including the sub-scale items' means and standard deviations. The CAS was implemented to the participant to ensure that any negative statement about using the web-based learning tool does not come from students' attitudes towards computers. In other words, the participants' low CAS score could cause participants to provide negative responses to the questionnaire items in general.

Table 1. Summary of sub-scales of the CAS

Sub-scales	Mean	SD	N
Anxiety	3.10	0.43	22
Liking	3.22	0.39	22
Confidence	3.19	0.54	22
Usefulness	3.03	0.41	22
Total	3.13	0.39	22

3.2. Students' perceptions about the web-based learning tool

The results on student perceptions about the web-based learning tool are categorized according to the three main pages of the tool which were (i) dictionary page, (ii) activities page, and (iii) chat page. Results are presented as percentiles are obtained by summing 'agree' and 'strongly agree' as positive perceptions, 'disagree' and 'strongly disagree' as negative perceptions.

Findings on the dictionary page. The findings indicate that nearly half of the students (45.5 %) stated that the dictionary page helped them in their vocabulary learning. Exactly half of the students (50.0 %) thought that dictionary page was easy to use. More than half of the students (63.6 %) thought that their listening acquisition was better than before because

they could hear the pronunciation of the words in the dictionary page. The last item about dictionary page perceptions of students aimed to find out whether they could pronounce better. About one of each three students (36.4%) stated that they did much better with the web-based learning tool. Table 2 presents students perceptions about dictionary page of the web-based learning tool.

Table 2. Students' perceptions about the dictionary page

Items	SD % (f)	D % (f)	N % (f)	A % (f)	SA % (f)	Mean (f)	St.Dev
Dictionary page helped me to learn the words easier.	13.6 (3)	13.6 (3)	27.3 (6)	18.2 (4)	27.3 (6)	3.23 (22)	1.31
Dictionary page was easy to use	4.5 (1)	22.7 (5)	18.2 (4)	18.2 (4)	31.8 (7)	3.38 (21)	1.20
Being able to hear the pronunciation of the words in the dictionary page, I have acquired listening acquisition much better than before.	13.6 (3)	13.6 (3)	9.1 (2)	40.9 (9)	22.7 (5)	3.45 (22)	1.37
I pronounced the dictionary page words much better with the help of the pronunciation tool than I learned before.	22.7 (5)	27.3 (6)	13.6 (3)	27.3 (6)	9.1 (2)	2.73 (22)	1.35

Students were asked whether they listened to the pronunciation of the words presented in the dictionary page. The majority of the student either stated that they (40.9%) had listened to all of the words in the dictionary page or that they (18.2%) heard to most of the words. It was interesting to find out that although most of the students had listened to most of the words, more than half of the students (54.5%) did not repeat the pronunciations they listened and more than quarter (27.3%) repeated some of the words. Only a small portion (9.1%) of the students repeated to all of the pronunciation of the words, and 4.5% of them listened to most of the words. While some of the students were repeating the pronunciation of the words most of the students (77.3%) stated that they didn't give an effort to pronounce the words exactly like they heard. Findings on student usage of the pronunciation tool in the dictionary page are presented in Table 3.

Table 3. Students' usage of the pronunciation tool

Items	None % (f)	Some % (f)	Half % (f)	Most % (f)	All % (f)	Mean (f)	St.Dev
I listened to the pronunciation of the words in the dictionary page.	22.7 (5)	4.5 (1)	13.6 (3)	18.2 (4)	40.9 (9)	3.50 (22)	1.63
I repeated the pronunciation of the words after listening.	54.5 (12)	27.3 (6)	4.5 (1)	4.5 (1)	9.1 (2)	1.86 (22)	1.28
When I was repeating the pronunciation of the words, I tried my pronunciation to be exactly like the one I heard.	77.3 (17)	13.6 (3)	— (0)	— (0)	4.5 (1)	1.33 (21)	0.91

Findings on the activities page. The first item was questioning whether the students enjoyed using the activities page. The findings revealed that 72.7% of the students perceived that practicing by playing a game (doing the crossword puzzles) was amusing and joyful. The next item was whether this was helpful for their vocabulary learning. One again, the majority (63.6%) of the students thought that making practice by game playing is helpful to their vocabulary learning. Whether the crossword puzzle helped the students in practicing the spelling of the dictionary words was answered by half of the students (%50) as "yes" it helped them in terms of practicing the spelling of the words. There was a small group of students (18.2%) who stated that the crossword puzzle had no effect on improving their spelling of the words.

Two questions were related with students' use of activities page together with the dictionary page. Half of the students (50%) stated that they remembered the words from the dictionary page while doing the crossword puzzle activity where 18.2 % of the students disagree with the statement. Nearly half of the students (40.9%) had used the dictionary page when they couldn't find a word in the crossword puzzle. The findings on student perceptions about activities page is presented in Table 4.

Table 4. Students' perceptions about the activities page

Items	SD % (f)	D % (f)	N % (f)	A % (f)	SA % (f)	Mean (f)	St.Dev
It was amazing and joyful to make practice by playing game.	— (0)	9.1 (2)	13.6 (3)	22.7 (5)	50.0 (11)	4.19 (21)	1.03
Making practices by playing game helped me in my vocabulary learning.	— (0)	18.2 (4)	13.6 (3)	13.6 (3)	50.0 (11)	4.00 (21)	1.22
Crossword puzzle helped me in making practice of the spelling of the words.	9.1 (2)	9.1 (2)	22.7 (5)	31.8 (7)	18.2 (4)	3.45 (20)	1.23
I remembered the words asked in crossword puzzle from the dictionary page.	4.5 (1)	13.6 (3)	22.7 (5)	18.2 (4)	31.8 (7)	3.65 (20)	1.27
When I couldn't find a word in crossword puzzle, I used the dictionary page.	18.2 (4)	18.2 (4)	18.2 (4)	18.2 (4)	22.7 (5)	3.10 (21)	1.48

Findings on the chat page. The students were asked whether being able to listen to the written text during their chat sessions was helpful in improving their listening acquisition. Half of the students (50%) expressed that chat page was helpful to them in acquiring listening acquisition. Students were also asked to evaluate the chat environment. They were requested to compare whether they were more comfortable in expressing themselves in the chat page environment or in the classroom environment. Nearly half of the students (45.4%) thought that they could express their ideas easier in the chat environment. Some students (27.3%) disagree with that idea meaning that they preferred the classroom environment for discussions. Half of the students (50%) stated that they had no problems in expressing their ideas in the chat environment. There were also some students (22.7%) stating that although they had ideas about the discussion they felt nervous in participating in the chat sessions. Closely related with this item, the results indicated that the majority of the students (54.5%) were more comfortable in making mistakes while talking or writing in the chat page with comparison to classroom environment. It is significant to state that a significant portion of the students (36.4%) were afraid of making mistakes while talking or writing in both environments.

According to students perceptions, the pace of the written conversation in the chat environment came out to be a little faster than it should be, about one of every three students (36.4%) stated that he/she could follow the conversations easily. Half of the students (50.0%) stated that they had difficulties in following the conversations in the chat environment. The results on student perceptions about chat page are presented in Table 5.

Table 5. Students' perceptions about the chat page

Items	SD % (N)	D % (N)	N % (N)	A % (N)	SA % (N)	Mean (N)	St.Dev
Being able to hear the writings in the chat page, I have acquired listening acquisition.	9.1 (2)	4.5 (1)	31.8 (7)	27.3 (6)	22.7 (5)	3.52 (21)	1.21
I express myself more easily in chat environment than classroom environment.	9.1 (2)	18.2 (4)	22.7 (5)	22.7 (5)	22.7 (5)	3.80 (21)	1.61
Although I had ideas about the discussion topic, I had troubles in participating to chat session.	4.5 (1)	18.2 (4)	27.3 (6)	18.2 (4)	31.8 (7)	3.55 (22)	1.26
I'm not afraid of making mistakes while talking/writing in chat environment as much as I am in the classroom environment.	18.2 (4)	18.2 (4)	9.1 (2)	40.9 (9)	13.6 (3)	3.14 (22)	1.39
I could easily follow the written conversation in the chat environment.	18.2 (4)	31.8 (7)	13.6 (3)	18.2 (4)	18.2 (4)	2.77 (22)	1.38

Problems students faced while using the web-based learning tool and their requests for improvement. Most of the students (91%) did not face any problems while using the dictionary page. Only a very small portion of students (4.5%) wrote that the dictionary page was insufficient in terms of words contained. Considering the chat page, most of the students (72.7%) did not face any problems while using it. On the other hand, a small group of students (27.3%) stated that they were not able to follow the conversation in the chat sessions because of the pace of talking. Considering the activities page, all of the students (100%) didn't face any problems. Table 6 summarizes the problems that students faced while using the pages of the tool.

Table 6. Problems students faced while using the web-based tool

Problem	f	%
Dictionary Page		
I had no problems	20	91.0
I think that dictionary page is insufficient	1	4.5
Chat Page		
I had no problems	16	72.7
I had difficulties in following chat conversations.	6	27.3
Activities Page		
I had no problems	22	100

Students were requested to write their requests for improving the tool. Students (24.1%) wanted to have more vocabulary items in the dictionary page. Some of the students (13.8%) stated that it would be nice to have pictures of the words in the dictionary page. One student indicated that animation could be used to explain the meanings of the words. Another student thought that he/she would prefer the direct native meanings of the words instead of English explanations. Last, a student wrote that they would understand the meanings of the words better if sample sentences were provided. When the results are investigated considering the chat page, almost half of the students (40.9%) stated that there should be private chat rooms. Some of the students (27.3%) stated that there could be other game activities in addition to crossword puzzle.

Perceptions about the animated character. More than half of the students (63.6%) stated that the animated character “Merlin” was aesthetically appealing. Most of the students (68.2%) stated that the pace of speech of the character was neither fast, nor slow but appropriate. More than half of the students (59.1%) stated that the tone of talk of the Merlin character was clear. Most students (77.2%) found the amount of directions for using properties in each page provided by Merlin character sufficient. More than half of the students (59.1%) found the Merlin character usable in terms of directions it provided to the user. Finally, nearly half of the students (45.4%) stated that directions of the Merlin character helped them to locate information easier within the site. Perceptions about the Merlin character are presented in Table 7.

Table 7. Students' perceptions about the MS-Agent character

Items	SD % (f)	D % (f)	N % (f)	A % (f)	SA % (f)	Mean (f)	St.Dev
The Merlin character was aesthetically appealing.	— (0)	4.5 (1)	22.7 (5)	9.1 (2)	54.5 (12)	4.25 (20)	1.02
The pace of speech of the Merlin character was appropriate.	4.5 (1)	9.1 (2)	9.1 (2)	18.2 (4)	50.0 (11)	4.10 (20)	1.25
The tone of talk of the Merlin character was clear.	4.5 (1)	9.1 (2)	13.6 (3)	13.6 (3)	45.5 (10)	4.00 (19)	1.29
The amount of directions provided by the Merlin character for each page was sufficient.	— (0)	4.5 (1)	9.1 (2)	22.7 (5)	54.5 (12)	4.40 (20)	0.88
Merlin character was usable in directing me.	13.6 (3)	4.5 (1)	13.6 (3)	18.2 (4)	40.9 (9)	3.75 (20)	1.48
The directions of the Merlin character helped me to locate information easier.	9.1 (2)	13.6 (3)	22.7 (5)	13.6 (3)	31.8 (7)	3.50 (20)	1.40

4. Conclusions and Recommendations

The purpose of this study was to investigate and present the design, development and implementation of a web-based learning tool for English as second language in the context of elementary level instruction. The discussions are provided parallel with the research questions and the results.

Godwin-Jones (2009) indicated that projects and researches focusing on speech technologies follow the same basic structure: students listen the model speech, pay attention to the pronunciation, then are asked to generate utterance themselves. However, the findings of this research reported that with regard to the dictionary page, it was seen that most of the students preferred to listen to the pronunciation of most of the words, but conflictingly almost none of the students tried to repeat the pronunciation of the words after listening. The possible reason for this result was discussed with the subject area teacher. The discussion results with an interesting speculation which was that the students didn't have the habit of listening and repeating in general. The teacher explained this by stating that in their class they hadn't made classical "listen and repeat after me" practices. When a student made a pronunciation mistake the teacher deal with that student individually and

they work on the correct pronunciation shortly. The reason for students listening to the pronunciation of most of the words, but not giving any effort to repeat the pronunciation might be this speculation. The above situation is explained by Zhao (2003) as

“In traditional instructional settings, feedback and modeling are often provided by an instructor, who may or may not be good at judging the student pronunciation in the first place. Typical ways to provide feedback often include having students repeat the pronunciation or explaining how the sound should be produced in a very abstract fashion” (p.17).

More than half of the students (72.7%) thought that practicing by doing activities (crossword puzzles) and interacting with the web based tool was joyful. This finding supports previous studies. First of all, Weinberg (2002) revealed that students enjoyed during multimedia activities because they have the control the material. In another study McCreesh (1989) found that most of the students found working with computers enjoyable. Lee (2005) presented that learners enjoyed chatting online and writing online essays (means 4.06 and 4.42 correspondingly). Moreover, Jones and Fortescue (1991) clearly states that computers offer a different environment for the students, that is computerized activities motivate students. Marshall (1987) and Gilby (1989) indicated that for students doing interactive computer exercises it was more exciting than pencil and paper exercises. In his study, Church (1986) found that most of the students did not find exercises very helpful for vocabulary learning, whereas 63.6% of the students who participated in this study thought that spelling exercises were very helpful in the computer environment. In accordance with this comment, half of the students (50%) indicated that crossword puzzle helped them in practicing the spelling of the words.

Nagata (1998) found that most of the students referred to the vocabulary hints and grammar notes while doing the CALI (Computer-Assisted Language Instruction) exercises. In accordance with this finding, nearly half of the students (40.9%) used the activities page together with the dictionary page in the current study. It is usual that when a second language learner notices an unknown word, consulting a dictionary is the most possible action (Peters, 2007).

Similarly, some students suggested that visual annotations about the vocabulary item should be presented. Students' point is supported by Jones (2009) that presence of pictorial annotations help students to store information in the long term memory. Yeh and Wang (2003) explained three versions of vocabulary annotations as text, still images, and series of pictures. In a hypertext environment these annotations can be pronunciation, video, text and graphics (Davis, 1989, cited in Yeh & Wang, 2003, p.132). Yeh and Wang concluded that text and picture annotations was the most effective and best performed version among “text only”, “text, picture and audio”. A similar conclusion was drawn by Bekleyen and Yılmaz (2012) that using images to learn new/unfamiliar vocabulary items was a valuable feature of a software.

Sykes (2005) concluded that chat environment can provide an environment for students to practice pronunciation and intonation. Sykes continued that using oral chat and written chat together offers learners the possibility to practice both orally and in writing at the same time. Payne and Ross (2005) concluded that “the chatroom may provide a unique form of support to certain types of learners in developing L2 oral proficiency” (p.50) for second language acquisition in a synchronous computer mediated communication environment. Although the literature presents positive conclusions about online chat environments in terms of practicing and acquiring listening/pronunciation comprehension, in this study the results are not that much affirmative. Based on the findings of this study, half of the students positively indicated and more than thirty percent were neutral that chat environment helped them to acquire listening comprehension. On the other hand it is worth to note that the findings of this study were not pessimistic as the findings were showing tendency to positive. The reason that the findings didn't meet our expectation might be that most of the positive finding reporting articles included a feedback mechanism in their research design. For example, the study of Hincks and Edlund (2009) revealed that watching or listening pronunciation of recorded pronunciations or utterances positively perceived by students. Their research design included visual feedback and this might be the reason of high positive perceptions of improving pronunciation. The study of Ducate and Lomicka (2009) focused on use of pod-cast to improve students' pronunciation without a feedback mechanism. Their statistical analysis showed that there were no significant differences from pre-test to post-test over time and between tasks in terms of students' pronunciation improvement. This research and the literature research studies show that use of computer mediated chat or video without a feedback mechanism is not as effective as or is not better perceived than a system with feedback mechanism.

According to Kataoka (2000) students communicate more comfortably and freely in online environments. In other words, learners show less social anxiety in an online communication environments (Böhlke, 2003; Lee, 2005; Roed, 2003). Huebener (1960) argue that when students work within an individualized environment, whenever the student makes an error he or she is not embarrassed, as compared to classroom environment. Morris (2005) reported that not only individualized environment, but also in collaborative environment like chatrooms students are more comfortable in participating. The findings of this study are supportive to these arguments. While discussing this result with the subject area teacher, she similarly indicated that the students were freer and participate more in chat environment than classroom environment.

Most of the students stated that they didn't have any problems while using the pages of the web-based tool. One important indication of the students was that they had difficulty in following the writings in the chat page. This also happened in the study of Sotillo (2000) in his research on online communication. The study showed that rapid message posting resulted in loss of chronological information, which made it difficult for the students to concentrate on the subject being discussed. A similar situation occurred for the chat sessions of the web-based tool developed in this study. The teacher also stated that it sometimes became difficult to read the chat conversations. The possible reasons and

solutions were discussed with the subject area teacher. As a result of this discussion, it was concluded that private chat rooms with smaller number of students could increase teacher control on the conversations. Moreover, since there would be smaller number of messages posted per minute students could follow the conversations easier. These private chat rooms could be formed according to groups or topics. The chat rooms may be divided into main topics then special chat rooms could be formed. The pace of speech of the Merlin was adjusted one week before the implication with the subject area teacher. It may be the result of this action that the students found the pace of speech of the Merlin character appropriate.

In general students liked the animated Merlin character used in this study. The pace and understandability of its speech were positively perceived by the students. Handley (2009) asked similar questions about machine generated pronunciation. The questions Handley asked included “Is the speech adequate for use as a reading machine, is the speech acceptable for use, is the message easy to understand, is the pronunciation correct, ...” for four French text-to-speech systems. Although the results of Handley’s research were not promising, the author recommends that text-to-speech research must be conducted for other languages. This research provides a small perception contribution that that pace and understandability of computer generated speech in English were found to be positive on contrary to Handley’s findings.

Such a technology could also be used especially for targeting listening skill. Moreover, it can be used as an online assistant as students perceived the internet character as functional in guiding them. Therefore, such a technology is promising and could be used for several purposes in online teaching and learning.

5. Implications

Based on the finding of the current research there are implications for practitioners, teachers, designers and all educational technology professionals. These implications are based purely on the findings of the current study and case and there might be differences in different learning environments. Therefore, they should not be understood as global facts for CALL applications but suggestions of the authors. The implications that can be driven from the results are listed below.

1. Dictionary page should include images, or animations for explaining the words.
2. Dictionary page should provide sample sentences for the new words presented.
3. There should be a general dictionary page more words in addition to the one that only presents new words of the chapter.
4. The students should be given the opportunity of practicing in attractive ways. Different type of activities for the same chapter should be provided.
5. If speech technology is going to be used for listening, the pace of speech should be adjusted with the classroom teacher and students before the implication.
6. The students should have the freedom to choose their own animated character from a wider range of characters.
7. Private chat rooms that could be managed by the teacher should be provided. For an ideal communication there should not be too many persons at a specific chat room.

The study of Böhlke (2003) showed that four students per group achieved a high level of equal participation in the chatroom.

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