Language practice with multimedia supported web-based grammar revision material

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Abstract

The aim of this study was to investigate the perceptions of elementary-level English language learners towards web-based, multimedia-annotated grammar learning. WEBGRAM, a system designed to provide supplementary web-based grammar revision material, uses audio-visual aids to enrich the contextual presentation of grammar and allows learners to revise target grammatical structures using interactive exercises such as gap-filling, combo-box and drag-and-drop exercises. This study gathered quantitative data on learner satisfaction, attention and participation and qualitative data with regard to the material's content, visual and instructional design, usability, practicality and effectiveness. The findings indicate that learners enjoyed using the material and developed a positive attitude towards the system.

Keywords: web-based, interactive learning, multimedia, language learning, e-learning

1 Introduction

Over the last decade, ideas that second-language learning requires a certain amount of focus on form and that form should, to some extent, be learned explicitly have been steadily gaining ground (Norris & Ortega, 2000). Exactly what instructional activities this implies, however, remains the subject of considerable controversy. The use of information communication technologies (ICT) has become widespread in

recent years (Liou, 2000; Warschauer, 2000), and studies measuring the effects of technology-enhanced instruction on language learning have also grown in number (Al-Jarf, 2004; Meskill & Anthony, 2005; Schwienhorst, 2004; Banados, 2006; Scida & Saury, 2006). Yet, despite the increased role of computer-assisted language learning (CALL) in curriculum and instruction, its effects on language development and, more specifically, grammar learning, is an area that requires further exploration.

Technology is used to perform many functions in the language classroom. One function has been to create the main characteristics of a communicative classroom by engaging learners in real and meaningful communication. Another major function has been to provide opportunities for learners to practise the language through mechanical activities that are not normally used in the classroom. As Felix (2001) states, new technologies offer excellent opportunities for adding value to classroom teaching in a variety of ways. Through on-line exercises, learners have the opportunity to select from a given set of options or to construct their own answers, and texts, graphics, audio and video materials can be used as media for the presentation of questions and answers (Wu, Witten, Edwards, Nichols & Aquino, 2007). However, only when on-line learning environments are properly structured can they move instruction from teacher-centered, lecture-based, passive instruction to learner-centered, self-reflective and active learning. It is worth noting that technology itself does not cause advances in learners' cognitive abilities, nor does it guarantee the development of higher order skills, which can only be developed in a well-designed, properly structured learning environment (Quitadamo & Brown, 2001). In addition, Ma and Kelly (2006) emphasize that the quality of CALL programs is determined more by their methodology than by their computer technology. It is also important that during the instructional process students are made aware of the fact that learning English through multimedia demands new learning strategies and self-directed learning (Yang & Chen, 2007).

Clark and Mayer (2003) suggest some principles regarding multimedia use in designing web courses based on cognitive learning theory. They suggest using words and graphics rather than words alone (multimedia principle), placing corresponding words and graphics near to each other (contiguity principle), presenting words as audio narration rather than on-screen text (modality principle), avoiding extraneous sounds (coherence principle), avoiding presenting words in both text and audio narration (redundancy principle), and using conversational style and virtual coaches (personalization principle). However, it is suggested that these recommendations might change according to the goal of training, the prior knowledge of the learners and the environment in which the training will be deployed.

According to Mayer's generative theory, which is a cognitive psychological theory on processing information, multimedia learning provides the learner with information through different (e.g. visual, auditory) modes (Mayer, 2001). Mayer's theory is based on Paivio's (1990) dual-coding theory, which claims that words that are coded in two modes are learned better than those coded using only one mode. Paivio's dual-coding theory is supported by the research of Plass, Chun, Mayer and Leutner (1998), who found that learning is best when new language input is both visually and verbally annotated. Furthermore, a multimedia environment takes into account individual differences in learning preferences by offering learners a choice from

among different modes of information, made attractive through enjoyable activities supported by sound, visuals, animations and video.

2 Computer-based grammar teaching

Computer-based grammar teaching has not received the same amount of attention as communicative CALL (Nutta, 1998). Although it offers many benefits, the use of computers to teach grammar has not increased through the years and has not been researched as much as the communicative aspects of CALL. While computers are unable to completely engage learners in authentic two-way communication, they can, in fact, provide rich input in the form of integrated multimedia programs and explicit grammar explanations that learners can review at their own pace (*op. cit.,* 1998).

The literature, does include some research studies on computer use in second language grammar learning and materials. According to Al-Jarf (2005), research into the use of computer-assisted instruction in English-language teaching indicates that computer-based grammar instruction can be as effective as or more effective than traditional techniques of instruction such as workbooks and lectures. These findings should hopefully lead to a greater role for multimedia tools that develop grammatical competence within the context of English language teaching. In their study on researcher created drill and practice courseware, Liou, Wang and Hung-Yeh (1992) found that a combination of traditional instruction and CALL seems to contribute to L2 learning more than traditional instruction alone. Nagata (1996), in his study on intelligent computer versus workbook grammar instruction, found that computer instruction is more effective for teaching grammatical skills and intelligent feedback is important. In another study on computer assisted meta-linguistic instruction to teach grammatical structures, Nagata (1997) found that students were able to understand complex grammatical concepts through computer exercises with the help of meta-linguistic feedback. Gonzalez-Bueno and Perez (2000) in their study on grammatical and lexical accuracy and quantity of language through e-mail found significant advantages of using e-mail over paper-and-pencil-based dialogue journals in terms of quantity of language, but no advantages in the development of lexical and grammatical accuracy.

Due to the increase in the availability and usage of web-based courses, many research studies have been conducted to examine learners' attitudes and satisfaction regarding the implementation of a web-based course. Understanding how these factors influence the learning experiences of learners is important because it necessitates improvements in web–based courses to make them more effective (Kim & Moore, 2005). The success of any training material is largely dependent on the learners' motivation and attitude, which are mostly affected by the material's usability and user-friendliness. Whenever learners complain about web-based learning material, it is mostly the interface and usability of the material, rather than the educational content of the material which concerns them. Usability has a significant role on the success of e-learning since poor usability might well obstruct learning (Ardito *et al.*, 2006). Therefore, educators must attempt to stimulate and sustain student motivation through the design of effective interactions in web-based learning environments (Reeves & Reeves, 1997). Berzosa and Rokowski (2000) found the motivation of the learners to be the most outstanding characteristic of computer assisted language learning. Thus, there are questions to be

answered after releasing any material for learners' use: what do the learners really think about the use and usability of the learning material? Are they satisfied with it, and how much time do they allocate for studying with it?

The purpose of the current study was to determine how learners respond to the usability of web-based supplementary material and to investigate whether such material supports their learning in a user-friendly manner. The study is expected to contribute to the literature by providing research findings and conclusions on computer-assisted language learning with lower level learners (Campbell, Brown & Weatherford, 2008) specifically on computer-based grammar teaching (Nutta, 1998) and contribute to the limited literature about assessing the effectiveness of hybrid online language courses (Murday, Ushida & Chenoweth, 2008).

3 Outline of the study

This study reports on the major characteristics of WEBGRAM, a web-based grammar revision support system, and learners' perceptions of the material. As suggested by Clark and Mayer (2003), the software that is the focus of this study was designed with cognitive learning theory principles (multimedia, contiguity, modality and personalization were employed) at its foundation and features of effective web-based materials and foreign language grammar instruction techniques as its main points of reference. Following the main principles of WEBVOCLE (Baturay, Yıldırım & Daloğlu, 2009), an earlier system developed by the researchers that focused on vocabulary retention, the contextual presentation of the grammatical structures in WEBGRAM was enriched with multimedia resources, taking account of cognitive learning theory principles in a web-supported environment. Differing from other grammar teaching materials, WEBGRAM provided learners with spaced repetition of grammatical structures based on Ebbinghaus's rate of forgetting curve (1885, cited in Waring, 2004), which suggests that repetitions distributed over time may support long-term memory retention. All these arrangements were hypothesized to affect positively learners' perceptions of the material, as well as their attention and satisfaction levels.

WEBGRAM was designed as support material to present, explain and provide opportunities for the practice of grammatical structures outside the classroom. As a result, more classroom time can be dedicated to real communication that focuses on expressing meaning and using appropriate grammatical structures to express that meaning, as suggested by Nutta (1998). It aims to give learners the chance to regulate their own learning through the use of effective time-management strategies, self-assessment of learning outcomes and the establishment of personalized learning targets. Through the individualized instruction provided by the material, teachers can identify areas that require further classroom focus and provide remedial instruction in these areas.

This study aimed to answer the following questions:

1 What are learners' perceptions regarding the content, visual and overall design of the web-based material?
2 What are learners' levels of satisfaction, attention and participation with the online material and how do they compare with those of traditional methods?

4 Method

4.1 The students

The study was conducted in the fall semester of the 2007–2008 academic year. The participants comprised 54 English language learners at Gazi University School of Foreign Languages in Ankara, Turkey (female: 19; male: 35; age range: 17–23 years). Participating learners were enrolled in one of two sections of a compulsory language course and had the same level of English-language proficiency (elementary), as determined by a universal examination required for all entering students at the School of Foreign Languages. Students in these two sections received the same instruction as students in the other sections of the course, but were also given WEBGRAM as supplementary material for the revision of pre-learned grammatical structures.

4.2 Data collection and analysis

This study is both quantitative and qualitative in nature. Quantitative data was collected through the checklists and surveys; qualitative data was collected through the comment parts in the checklists. Reeves (1997) stated that the qualitative paradigm explores (a) the dynamics of interactions with the emphasis on the world as a socially constructed reality involving multiple perspectives; (b) the various possible interpretations through the perceptions and values of all the participants in a situation. Quantitative data was descriptively analyzed which simply means that frequencies and standard deviations were employed. Qualitative data included iterative cycles of examining the patterns and ideas in the participants' comments. Then, the researchers explored similarities and differences among the learners' views from the collected data. Later, the general themes were identified and the researchers searched for confirming and disconfirming evidences about these themes that would be incorporated into the conclusions. After counting the themes and 'yes/no' with 'not sure' responses in the checklist, all data were presented in frequencies and percentages. Data regarding demographics, previous experience with web-based learning and location of computer access of learners were collected at the beginning of the semester, whereas, satisfaction and attention scores and qualitative data were collected at the end.

4.3 The checklist

Learners' perceptions about WEBGRAM's visual and instructional design, usability, practicality and effectiveness were obtained through a 16-item checklist containing closed-ended items organized into three main areas (Content Design: 5 items; Visual Design: 4 items; Overall Design: 7 items). Learners were asked to respond 'yes/no' or 'not sure' to the closed-ended items and were provided with extra space where they could write down any additional comments. In designing the checklist, researchers were guided by the first of Kirkpatrick's (1994) four levels of training evaluation, which focuses on student thoughts and feelings in response to the training. The items addressing the visual design of the material were chosen from Heinich, Molenda, Russell and Smaldino (2002). The information on learner response to the material that was obtained through the checklists helped the

researchers to make necessary modifications and improvements to the WEBGRAM design after the study.

4.4 Attention and satisfaction survey

In addition to the checklist, at the end of the semester, learners were asked to complete a survey about their attention levels and satisfaction with WEBGRAM. Specifically, learners were asked to comment on how effective they perceived on-line learning to be and how satisfied they were with the specific components of the on-line material. Using a 1–5 Likert Scale (1 = "not true", 5 = "very true"), learners were asked to report their perceptions by responding to twelve statements about attention and six questions about satisfaction. The statements were adapted from Keller's Instructional Materials Motivation Survey (IMMS) (1993), which was developed from two of the four components (attention, relevance, confidence and satisfaction) of his ARCS motivation model (1987). The scale was translated into Turkish and given to learners in their native language. The responses of the negative manner items in the attention subscale were reversed before the mean was calculated for the attention survey as suggested by Keller (1993). Reliability estimates were calculated, and Cronbach Alpha values of .89 and .92 were obtained, respectively, for the twelve questions on attention and the six questions on satisfaction.

5 The procedure

The main textbook used in the classroom was *Face2Face, Elementary* (Redston & Cunningham, 2007), whereas the contents of the WEBGRAM web-based grammar revision support system were adapted from the textbook *Focus on Grammar 1* (Schoenberg & Maurer, 2006) with the consent of the publisher. *Focus on Grammar 1* was selected because the content and grammar points were at the same language proficiency level and parallel to *Face2Face, Elementary*. WEBGRAM provided learners with additional exercises on two grammar issues they had studied in class.

At the beginning of the semester, learners were asked to complete a needs assessment questionnaire in order to identify their competencies and needs in using computers. According to their responses, 53 out of 54 learners (98%) had adequate computer skills and/or experience. The questionnaire also asked learners to rate their previous experience with web-based learning, based on the categories identified by Burrows (2001), as follows: (1): I have attended one or more web-based learning applications that were delivered completely via Internet; (2) I have used one or more blended learning applications; (3) I have had one or more experiences with web-supported instruction by visiting educational web sites, participating in forums and using list-servers; and (4) I have not had any prior experience with web-based instruction. The results indicated that none of the participants had previous experience with web-based or blended learning and only 26 percent of participants had some experience with web-supported instruction.

Before providing learners with access to WEBGRAM, a 30-minute exploration lesson was presented by one of the researchers that explained how to register, log-in and log-out of the system. Participants were also asked where they would use

Table 1 *Location of computer access*

	Frequency	Percent
Internet café	30	36.2%
Home	16	44.9%
Residence hall	8	18.8%
Total	54	100.0

WEBGRAM. The majority of participants relied on off-campus Internet access, which typically had lower speed than on-campus access. Slightly more than half (56%) of learners reported using WEBGRAM at Internet Cafés, less than half (29%) of participants used it on their own computers at home, and the remainder (15%) used it on shared computers available in their residence halls (Table 1).

Grammar structures were pre-taught in class. As a supplement, WEBGRAM focused on two grammar issues: *Simple Present Tense* and *Definite/Indefinite articles with 'some' and 'any'*.

WEBGRAM was implemented in three phases, as follows:

Phase 1 (1st revision): Phase 1 includes a total of four exercises, including a combo-box and fill-in-the-blanks exercises (Figures 2 and 3).

   A. Simple present tense: Structures are introduced in context through a reading and listening activity, followed up by combo-box and fill-in-the-blanks exercises.
   B. Definite and indefinite articles: Structures are introduced in context through a reading and listening activity, followed up by combo-box and fill-in-the-blanks exercises.

Phase 2 (2nd revision): A1, B1. Phase 2 includes a total of four fill-in-the-blanks writing exercises (Figures 4 and 5) – two for the practice of simple present tense and two for the practice of definite and indefinite articles.

Phase 3 (3rd revision): A2, B2. Phase 3 includes a total of two drag-and-drop listening exercises (Figure 6) – one for the practice of simple present tense and one for the practice of definite and indefinite articles.

Each WEBGRAM phase has an introductory explanation in Turkish and English (Figure 1).

For listening activities, learners were provided with audio versions of dialogues (Figure 2).

Figures 3–6 show examples of, respectively, a listening activity, a combo-box activity (A), a fill-in-the-blank activity (A1), a fill-in-the-blank activity (B1) and a drag-and-drop activity (A2).

Learners spent approximately 20–25 minutes on each activity in modules A and B and approximately 10–15 minutes on each of the revision activities (A1, B1 and A2, B2).

The WEBGRAM system included a reporting page through which the instructor was able to access information on each student's performance. By clicking on a student's name, the instructor could observe the amount of time the student allocated for each exercise (Figure 7).
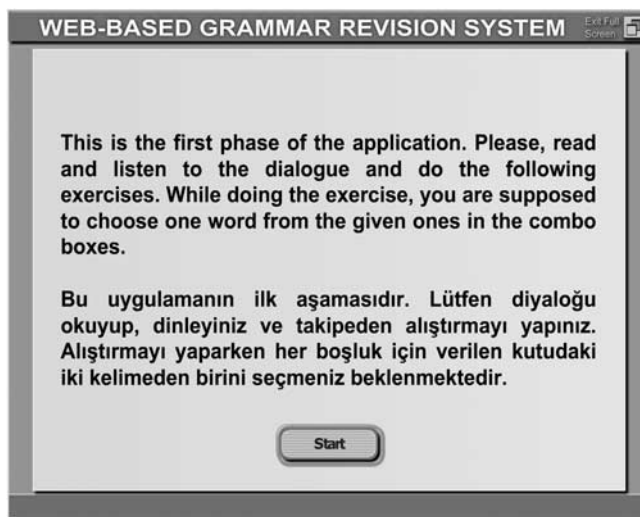
Fig. 1. A sample informative page (includes English and Turkish translation of the instructions)

6 Findings

6.1 Learners' Perceptions

Comments and suggestions on the content, visual appearance and overall design of the material were obtained from the checklists. Out of 54 learners, only 38 returned the checklists, and the majority of these did not provide comments (Table 2).

Learner feedback indicated that the language level of the WEBGRAM content was appropriate for the majority of learners (79%), who had no difficulties in comprehending the texts or deducing the meaning of grammatical structures from the given contexts (82%). Learners found the length of the dialogues appropriate (84%). Nearly half (47%) of the WEBGRAM learners were satisfied with the dialogue topics, with the most preferred content focusing on interpersonal relationships; however, some WEBGRAM users (37%) reported that they found the dialogues boring. The vast majority (92%) of WEBGRAM learners had no problems understanding the instructions.

With regard to the interface design, most WEBGRAM learners (87%) said they found it to be well-organized, harmonious and user-friendly, with the items well-placed on the web pages so that everything could be easily found. According to most learners (82%), the pictures helped them to comprehend the dialogues and the target grammatical structures by clarifying the details. The commonly used navigation tools, such as 'back', 'next', 'drag' and 'drop' did not create any problems and were found to be user-friendly for most learners (68%), nearly all of whom (98%) were computer literate. Moreover, most learners reported making use of WEBGRAM's flexibility, which allowed them to skip some exercises and return to them later. Learners also emphasized the importance of using the 'seeing the correct answer' button, which made them aware of their mistakes and helped them refrain from

Fig. 2. A sample reading and listening activity from Module B

making the same mistakes again. Most of the learners found the font size and type appropriate (92%).

The findings of this study indicated that more than half of the WEBGRAM learners (61%) were motivated to study the material. It should be noted that some learners stated that they were not satisfied (21%) or undecided (18%) about their satisfaction with WEBGRAM and that they thought it should contain more exercises and that the level of proficiency should be increased. Some learners (71%) found WEBGRAM suitable as supplementary material to in-class learning. These learners (16%) stated that WEBGRAM allowed them to access extra exercises to revise the pre-learned grammatical structures in a practical way, since they often had difficulties in finding other exercises appropriate for their level of grammar and vocabulary competence outside the textbook. Others (21%) stated that studying grammar and pronunciation at home was more enjoyable for them. One learner stated, ''At home I was able to study and learn Simple Present Tense, which I had not understood at school.'' WEBGRAM was designed so that the given contexts for target grammatical points supply learners with the clues needed for knowledge construction. This study found that most of the learners (90%) were satisfied with learning grammar in context and that this technique made it easier for them to learn the target grammatical structures. Learners (92%) also liked the fact that WEBGRAM gave them the ability to repeatedly revise these structures by themselves,
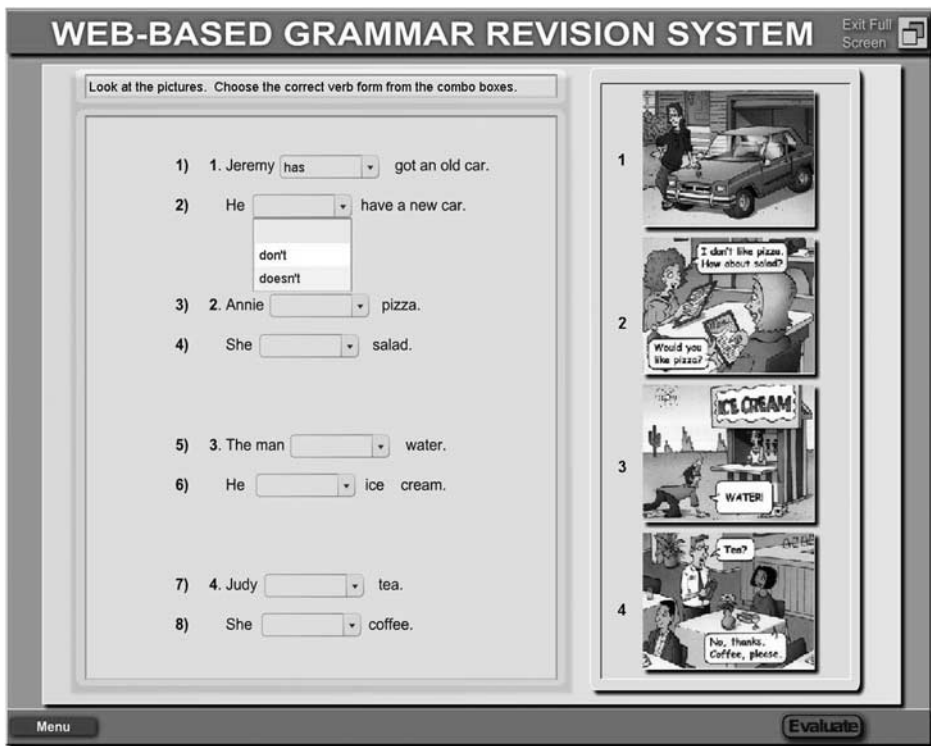
Fig. 3. A sample combo-box exercise from module A

without a CD and player, and recall these structures. In addition, most learners (84%) said they enjoyed listening to the dialogues because it helped them to decrease their pronunciation mistakes and improve their pronunciation of the words in the dialogues and their spoken English in general. Although learners were accustomed to a traditional classroom environment and had no prior experience with web-based learning, most learners (76%) found using WEBGRAM fast, organized and not unduly time-consuming. Although the majority of WEBGRAM learners (84%) found it trouble-free and uncomplicated from a technical point of view, some users (11%) reported problems related to slow screen loads caused by a low connection speed and screen resolution and/or browser incompatibility that caused navigation buttons to disappear from their computer screens.

6.2 Learners' Satisfaction, Attention, and Participation Levels

Data on learner satisfaction and attention levels were collected through the questionnaires and descriptively analyzed. Student participation time, i.e. the time spent working on the material, was measured in minutes and seconds. The results indicate that learners reported above-average satisfaction with WEBGRAM (M = 3.33, SD = 1.2). Similarly, the result of the attention survey shows an above-average attention level (M = 3.52, SD = 1.1) (Table 3).

Fig. 4. A sample fill-in-the-blanks writing exercise from A1

When each item in the surveys was descriptively analyzed (Table 4), the results indicated that the material stimulated learners' curiosity (M = 3.02) and the content of the material helped keep their attention on the course (M = 3.08). The arrangement of the information on the pages (M = 3.00) and the quality of the writing helped to keep their attention (M = 3.00). They did not find the course material abstract (M = 1.67), nor did they find its pages dry and unappealing (M = 1.65). However, there were items indicating moderate attention levels: the existence of something interesting at the beginning of the course (M = 2.71) and finding the learnt things surprising or unexpected (M = 2.35). The repetitions throughout the material did not cause the learners to get bored (M = 2.18).

The satisfaction scores indicated that learners felt good when they successfully completed the exercises in the course (M = 3.67); they were pleased to work on the well-designed material (M = 3.51) and they liked the way feedback was given (M = 3.37). They enjoyed the web-based course (M = 3.20) and they stated that they would like to know more about the topic presented in the web-based material (M = 3.22).

7 Discussion

The learners were satisfied with the level of the content of the material and they found the texts comprehensible. As Jonassen (1994) has suggested, constructing learning environments that are context- and content-dependent enable knowledge

WEB-BASED GRAMMAR REVISION SYSTEM

Fill in the blanks by writing with the correct quantifier or article.

FARMERS MARKET

1. The man has a ....BAG.... of fruit in his hand.

2. There is a big .... of potatoes in front of the market.

3. The old man is eating .... ice cream.

4. The lady has a .... of fruit in her hand.

5. There are .... fruit on the ground in front of the market.

6. There aren't .... strawberries in the market.

a / an
some
any
bag
bowl
box

Menu   Evaluate

Fig. 5. A sample fill-in-the-blanks writing exercise from B1

construction that leads to meaningful learning. The learners found that using the WEBGRAM material for studying was not unduly time-consuming, which met their expectations in this respect. Smart and Cappel (2006) have stated that assignment length and time required to complete on-line modules are key factors in on-line learning because they seriously affect learner motivation. Unless learners feel that the amount of time they spend completing modules in an on-line environment is worthwhile in terms of the knowledge gained, they will lose the motivation to study the material (*ibid.*). This study found learners to be satisfied with the material's organized, convenient, quickly and easily accessible material. Learners' comments indicate that the material enabled them to learn and revise the target grammatical structures in approximately fifteen minutes. However, some users found the dialogues boring. As Yang (2001) has emphasized, interest is the impetus of learning. Other studies suggest that learners' interest in the content is among the most important factors influencing their motivation (Adler, Milne & Stablein, 2001). The learners felt comfortable using the material to study. They found it user-friendly and flexible enough, which allowed them to skip some exercises and return to them later. As Quitadamo and Brown (2001) have emphasized, a well-designed and properly structured on-line learning environment leads to the development of higher-order thinking skills.

Learners' perceptions regarding the concurrent use of pictures and dialogue are consistent with Paivio's dual-coding theory (1990). As the literature points out, broadening learners' potential by providing pictures, audio and video is a popular method in foreign language learning (Johnson & Heffernan, 2006).

Fig. 6. A sample drag-and-drop listening exercise from A2

The learners seemed to be intrinsically motivated to study the material. According to Krashen (1985) and Chang (2005), learners who possess high motivation and self-confidence are better equipped for success in second-language acquisition. Chang and Lehman (2002) found that students who were intrinsically motivated performed better academically at an instructional computer-based language-learning program. Ardito *et al.* (2006) assert that the success of any training program is largely dependent on students' motivation and attitude. The instructional design of the material incorporated context-based grammar learning and learner-centered learning approaches into an on-line learning environment so as to support learners' development of reasoning and problem-solving skills. Learners were expected to study via web material which was constructed in light of how the mind learns and experimental evidence concerning e-learning features that promote best learning (Clark & Mayer, 2003). The learners were satisfied with learning grammar by studying with this supplementary material and stated that it made easier for them to learn the target grammatical structures. This finding concurs with Liou, Wang and Hung-Yeh (1992), who found that the combination of classroom instruction and grammatical CALL might be helpful.

Attention, the primary aspect of Keller's ARCS model (1987), which coincides with the first step in Gagne's (1965) "events of instruction", has to do with gaining and keeping the learner's attention. Keller's strategies include sensory stimuli, inquiry arousal (thought-provoking questions) and variability (variance in exercises

Fig. 7. Sample reporting page indicating learner participation

and use of media). The online material's use of multimedia is believed to create a learning environment that stimulates learners' attention and promotes satisfaction. Keller (1987) suggests that learners must obtain some type of satisfaction or reward from the learning experience. This can take the form of entertainment or a sense of achievement. External rewards such as praise from the teacher, a high mark on a test, or a self-assessment exercise acknowledging the user's correct answers in a web-based learning environment are important; however, most important of all is learner satisfaction upon finding that studied items are useful and can help in obtaining high marks in coursework. Most of the learners were satisfied with the material. In fact, learners taking web–based courses are reported to be generally satisfied with their learning experience (Kim & Moore, 2005; Wegner *et al.*, 1999).

To conclude, almost all of the learners had positive perceptions regarding the usability and user-friendliness of the web-based material. Most of the learners were

Table 2 *Learners' perceptions regarding the content, and visual and overall design of WEBGRAM*

	Criteria	Yes (n)	No (n)	Not sure (n)
Content Design	Was the content appropriate for the learner's level of proficiency?	30	3	5
	Were the contexts effective for the comprehension of grammatical structures?	31	3	4
	Was the length of the dialogues appropriate?	32	2	4
	Were the dialogues interesting?	18	6	14
	Were the instructions comprehensible?	35	–	3
Visual Design	Was the interface design appropriate?	33	2	3
	Were the pictures beneficial to the comprehension of target grammatical structures?	31	3	4
	Were the navigation buttons practical?	26	6	6
	Were the font size and type appropriate?	35	–	3
Overall Design	Did this supplementary material motivate the learner?	23	8	7
	Was WEBGRAM suitable as a supplementary material to in-class learning?	27	5	6
	Was the technique 'Contextual guesswork' appropriate for learners' learning styles?	34	–	4
	Were the revisions beneficial to learners for recalling of the grammatical structures?	35	2	1
	Was listening to the dialogues beneficial?	32	–	6
	Was WEBGRAM successful at providing a fast and organized learning environment?	29	3	6
	Were there any technical problems?	4	32	2

Table 3 *Mean scores for participation, satisfaction and attention*

	Time*	Satisfaction Average	Attention Average
N	49	49	49
Mean	21:38	3.33	3.52
Std. Deviation	11:06	1.2	1.1
Minimum	04:59	1.00	1.00
Maximum	47:44	5.00	5.00

* The time was measured in minutes and seconds.

satisfied with the material which attracted their attention and aroused interest. In a similar online French course, most of the students reported being satisfied with the course and their progress learning the language (Chenoweth & Murday, 2003). However, modifications might be made in areas where learners indicated moderate attention level scores. For example, the beginning of the material might be made more interesting and some surprising or unexpected things might be added into the modules to arouse curiosity and motivation.

Table 4 *Mean scores for each item of the attention and satisfaction surveys*

	M	Std. Deviation
Attention		
There was something interesting at the beginning of this course that got my attention.	2.71	1.26
These materials are eye-catching.	3.37	1.07
The quality of the writing helped to hold my attention.	3.00	1.24
This course is so abstract that it was hard to keep my attention on it.	1.67	0.99
The pages of this course look dry and unappealing.	1.65	0.90
The way the information is arranged on the pages helped keep my attention.	3.00	1.14
This course has things that stimulated my curiosity.	3.02	1.27
The amount of repetition in this course caused me to get bored sometimes.	2.18	1.30
I learned some things that were surprising or unexpected.	2.35	1.35
The variety of reading passages, exercises, illustrations, etc., helped keep my attention on the course.	3.08	1.06
The style of writing is boring.	1.45	0.74
There are so many words on each page that it is irritating.	1.37	0.76
Satisfaction		
Completing the exercises in this course gave me a satisfying feeling of accomplishment.	3.02	1.25
I enjoyed this course so much that I would like to know more about this topic.	3.22	1.23
I really enjoyed studying this course.	3.20	1.24
The wording of feedback after the exercises, or of other comments in this course, helped me feel rewarded for my effort.	3.37	1.09
It felt good to successfully complete this course.	3.67	1.31
It was a pleasure to work on such a well-designed course.	3.51	1.18

1 = Not true, 2 = Slightly true, 3 = Moderately true, 4 = Mostly true, 5 = Very true.

8 Conclusions and further recommendations

This study suggests that blended learning of grammar – i.e. the use of supplementary web-based grammar revision material as an aid to in-class learning – can be used effectively in language courses. The findings reflect the perceptions of users which might be helpful to other practitioners or designers of online learning materials. However, the effects of web-based foreign-language instruction on students' perceived satisfaction and attention are still open to further investigation. In view of the current trend towards the integration of ICT into the curriculum, educational institutions need to be aware that in order to effectively benefit from these new technologies, curriculum design and instructional environments must be reinforced and updated. In designing any web-based material, the designer should keep in mind the fact that on-line education should not attempt to duplicate face-to-face learning/teaching, but should take into account the

many facilities available when using the Internet that are specific to on-line instruction. The design of e-learning applications deserves special attention. Designers need to follow both multimedia and pedagogical principles to develop effective and user-friendly web-based educational material.

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