Computer Aided Language Learning System for Arabic for Second Language Learners

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Abstract—This paper aims to build an Arabic learning language tool using Flash CS4 professional software with action script 3.0 programming language, based on the Computer Aided Language Learning (CALL) material. An extra intention is to provide a primary tool and focus on learning Arabic as a second language to adults. It contains letters, words and sentences at the first stage. This includes interactive practices, which evaluates learners' comprehension of the Arabic language. The system was examined and it was found that the language structure was correct and learners were satisfied regarding the system tools. The learners found the system tools efficient and simple to use. The paper's main conclusion illustrates that CALL can be applied without any hesitation to second language learners.

Keywords—Arabic Language, Computer Aided Language Learning (CALL), Learner, Material.

I. INTRODUCTION

LANGUAGE is one of the most essential things in our life. It has been a means of communication among people through all the times. Nowadays, people want to learn new languages and there are many more resources to learn in this area. The Arabic language has been studied in this system and it is one of the most vital languages spoken in the world. "Arabic is the largest member of the Semitic branch of the Afro-Asiatic language family". It has been in the written form since the 6th century AD and has been the language of the Quran as well [1].

It is more wide-ranging to explain here that it is going to take on a straightforward look on the basic Arabic language for second learners in this paper. One of the technical methodologies of learning and teaching Arabic language is the Computer Aided Language Learning (CALL).

CALL is used in education to facilitate the provision of language. It is a simple and attractive method for learners to learn languages.

This system uses CALL as a tool to teach Arabic as a second language, and puts learners in the first stage. It also takes advantages of the possibilities of computers in education through interesting environments instead of traditional classrooms. In addition, it provides an easy approach to learn languages anywhere and at anytime.

The tool is separated into three parts. The first part is the Alphabet that constitutes Arabic language letters (alif, bā and so on), as well as the vowels (fatha, kasra, and so on). This part has two activities: reading lesson and practices based on it.

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The second part of this tool is that which joined the letters as mentioned previously to compose words. Words have been divided into verbs, nouns, and so on with two activities: reading lessons and the practices.

The third part moves on to the sentences which focus on personal information and greetings with the same two activities: reading lesson and practices.

II. CALL SYSTEM

CALL System is useful in developing computer applications and learning languages. It finds techniques to use for educational purposes for language learners and improves their target language skills [2].

To enter into CALL system, some of the relevant definitions are a little bit necessary to know. They are:

1. *E-learning*: It uses new multimedia technologies and web application to access to resources and services in the world at anytime and anywhere. E-learning consists of computers and networks that transfer knowledge and services in multiple dimensions of interaction. The applications include learning on the web, learning on the computer, and virtual classrooms using information technology [3].

2. *CAL*: Computer Aided Learning (CAL) is used for a general subject area using computers in teaching and learning , a common case that indicates in learning any subject (including language learning) [2].

3. *CALL*: It is a Computer Aided Language Learning *(CALL)* for teaching and learning a specific language. CALL is an approach to find ways of studying and using computer application to do that. It gives an essential technology for assisting language learners to obtain important communication skills and to present materials in a certain language [4].

4. *First language (L1)*: It is also known as mother tongue, home language or native language. It is a language that a person learns by birth.

5. *Second language*: It is a language that is learnt after the first language or mother tongue or in addition to the first language. Therefore, it is called a second language (L2) [5].

6. *CALL History*: Computer Aided Language Learning began in the 1950s and 1960s in which software had been developed in Stanford University which was teaching languages and other subjects on large mainframe computers. Later in 1970s when the microcomputers appeared, it led an extreme change in the devolvement of CALL in Europe. Early in the 1980s, the most important

CALL was PLATO "(Programmed Logic for Automated Teaching Operations; by Chapelle and Jamieson 1984)". Since 1990s it is integrated with the multimedia and devolvement through internet more widely, causing further CALL application [6], [7].

CALL has been related to the use of computer for teaching language [8]. When language is learned via CDs/DVDs or websites, it is important for designers to use several technologies. This can include the skills of language (speaking, listening, reading, and writing) or a language area (grammar, vocabulary, pronunciation, discourse).

In general the learner has been interactive with CALL by typing on the keyboard, listening audios, and watching images and animation. After that the CALL gives feedback by evaluating the answers of the learner [9].

III. RELATED WORK

Greek as a second language can be shown on a multimedia interactive environment to teach the Greek language as a second language to children whose mother tongue is Turkish [10], with an objective to teach an introduction of technical education in minority schools (remote and backward areas in Greece).

CALL exercises for literacy parallels to the language and provides a certain degree of awareness about information technology system which consists of units (story-telling, translation into Turkish, activities, and grammar).

The system was tested in fourteen schools. *IT magazine matters4*, a magazine, rated the CALL that was applied and allotted it 9 out of 10.

For the efficiency of the system to be achieved, the following points have to be taken into consideration:
1. Provide the technical support.
2. Educate teachers on how to use the technology [10].

The next site for learning Arabic language had been chosen to expand knowledge.

Fig. 1 Teaching Arabic to Non-Arabic Speakers (Source: http://tutor.lootah.com/)

The site is divided into four phases for example, alphabet, word, sentence and conversation.

Alphabets: Displays the alphabet writing with pronunciation.

Words: Displays a range of places and name of things for example, cup, pen, and computer etcetera.

Sentences: Group of words joined together.

Conversation: A dialogue between two persons for example, the conversation can be at the airport, in the market, in the offices etc.

The site offers an audio speech that is translated into English. In addition, the website provides literal translation for users for example, the Arabic word زار (zara) means 'visited' in English.

Disadvantages of the website:
- It lacks images to illustrate the meaning of Arabic words.
- The sound sometimes does not work.
- It lacks exercises.
- The design of the website is not attractive to the visitors.

IV. SYSTEM DESIGN

Writing the CALL materials was very complex because of the nature of the Arabic language and its vastness. Therefore, the system focuses on the language functionality to solve these difficulties by means of references and persons who are interested in these fields.

The following figure indicates the overall of the architecture of the system that consists of the following components: graphical user interface, material, and feedback.

The interface allows to move the learner between these elements smoothly when he/she wants it and to choose subject that will satisfy the purpose. The learner has an opportunity to look at the subject taking the full impression from the quick review and disclose all the contents without any complexities.

The system contains a lot of knowledge in each part of a lesson, and takes an advantage of the possibilities available to the optimal use [11].
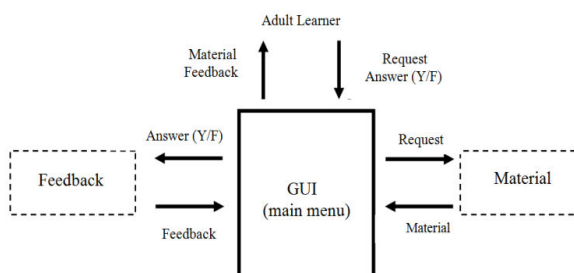

Fig. 2 System Architecture

The idea is to find a way to teach the Arabic language not through traditional method where learners learn at any place and at any time.

There are difficulties in learning Arabic language in terms of the writing direction as it has to be from right to left and in joining the letters (in the beginning, in the middle, in the end) likewise, the vowels (under or above the letter).This system also tries to simplify the difficulties faced by novice trainees in the language.

In the main menu, Fig. 3 indicates that the learners can choose the topics that they are interested in. These topics include:

- Letters: click at any of the 28 letters to get lessons and practices.
- Words: contains many examples of words used in our daily life with practices.
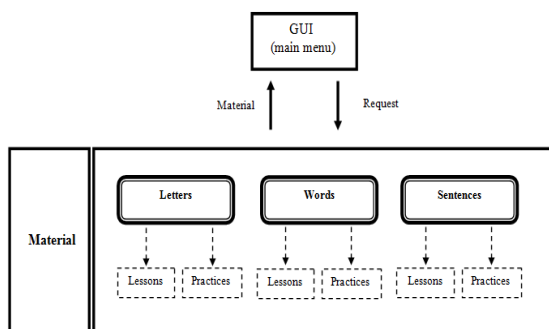- Sentences: enter the structure of a set of words to form sentences with practices on them.

Fig. 3 Course Material Architecture

Learners enter into the main menu through a comfortable interface. This can be summarized as:

- The title of the system is designed to achieve the goal which is teaching Arabic language.
- The main interface contains the contents of the three subjects (letters, words and sentences) so that it can be accessed to any of the contents just by clicking on it.
- The design contains a set of options that gives the learner a choice with ease the content he/she wishes to learn.

The letter is one of the options available in the system. It is one of the lessons and can be accessed by clicking on the letters button. After clicking the letter button, the system will go to the letters' lessons. At this, learners will start learning the letters in various forms. Thus, the learners can access any lesson within this subject whenever he/she is interested in.

The letters lesson includes Arabic letters for the beginner level. Particularly, it covers the following area:

- The Arabic letters.
- Letter in the beginning.
- Letter in the middle.
- Letter in the end.
- The vowels.
- Examples for joining letters.
- Practices.

The second subject in this system which was accessible from the main menu is words. This subject consists of the following components:

- Verbs.
- Nouns.
- Numbers.
- Family.
- Colors.

- Body parts.
- Public places.
- Seasons and directions.
- Practices.

The sentences are the third subject in the system. They can be accessed from the main menu. This subject consists of the following components:

- Self introduction.
- Greeting.
- Practices.

V. IMPLEMENTATION

The system contains many graphics, sounds, animation, colors and text for the functionalities. It executes by using an Adobe Flash CS4. Flash is a great tool for implementing the educational programs. It is a leading version of software for environmental interaction using sound, images and animations. Flash can be used to learn as well as to easily access to different software.

Flash Platform as a Flex framework is embedded with Action Script to develop and deploy this system. Technologies are open source to build a desktop and web applications. File.swf is the format to be run at server side using web browser. Flash upgrade integrates with extra Adobe products [3], [12], [13].

The next code shown is an example of choosing the correct letter's name answers practice. For running the practice smoothly, the learner should choose an answer from a multi-choice question.

Example: (ب)　　　　1. hā'　　　2. qāf　　　3. bā'

```
answerLetterBtn.addEventListener(MouseEvent.CLICK,answerLitter);
functionanswerLitter(event:MouseEvent):void
 {
   gotoAndStop(1);
   txt.text="";
   if (group.selection==null || group2.selection==null || group3.selection==null)
  {
   return;
  }

   // Right Answer.
   else   if   (group.selection.label=="thaa"   && group2.selection.label=="bā" && group3.selection.label=="tā")
  {
   txt.text="1-Correct     2-Correct     3-Correct ";
  }
```

The next code indicates to an example of joining the correct letter's name practice. Here the learner should write the correct words in the boxes.

Example: بَحَثَ ◄――――― ثَ + حَ + بَ

```
//....................Q1.........
if(ansJoinTxt1.text.toLowerCase() == "بَحَثَ")
```

```
    {
      resJoinTxt11.text="";
      resJoinTxt1.text="correct";
      correctMovi1.visible=true;
      wrongtMovi1.visible=false;
      }
      else
  {
        resJoinTxt1.text="";
        resJoinTxt11.text="incorrect";
        wrongtMovi1.visible=true;
        correctMovi1.visible=false;
  }
```

It can be simplified by using the interactive environments which would be closer to a wider understanding of the Arabic language, a main menu, Fig. 4, shows that learners can choose the topic that they are interested in and enter all materials which are included.

Fig. 4 System GUI

VI. EVALUATION

When the design is completed, the step of test and determination of the performance of the system are important.

It has to be appraised individually and then evaluated as a whole system. To investigate the goal of the system which has been developed, established questionnaires to both learners and teachers are sent and the evaluation are divided into two steps:

Cooperative evaluation: To evaluate the system, the Cooperative evaluation method is used. This approach encourages both the designer and the user to cooperate in order to find out the problems and create the solutions for it. The user works on the system and monitors the performance by the designer and writes the notes that may arise during the conversation and comments on questionnaires. This provides more specific information about the system, and thus access to a good evaluation in less time [14], [15].

Discussion: The questionnaire was given to 5 people, and only 3 responded it. Two out of the three were learners and one of them was a teacher. After analyzing the questionnaire, the initial results were as follows:

The system was sent by e-mails and the CDs. The learners and the teacher were given enough time to test the system and complete the questionnaire and write comments on it. After that, the system was discussed with them.

Through the analysis of Table I that shows the learner number 1 who has a desire to learn the Arabic as a second language and he finds that the system is easy to use through what is provided as the advantages of visuals such as animation, images, audio, and so on. And the system helps him to access the information more easily. He feels comfortable by using the appropriate colors, fonts, and exciting lessons. According to learner number 2 the sound should be higher and it should provide other features such as the ability to determine the level of progress in practices or the points calculated for each practice applied by the learner number 2.

However, the learners are impressed by the overall system as a useful and good design and they will use it in the future.

TABLE I
QUESTIONNAIRE

	strongly agree	agree	Neither agree nor disagree	Disagree	Strongly Disagree
1.I have the desire to learn Arabic (and I may or may not have started learning it already)		✓*			
2. I enjoy learning Arabic (and I am actually learning Arabic now)			✓*		
3. I want to learn to read Arabic		*	✓		
4. I want to be able to speak Arabic		✓*			
5. The Interfaces of the tools are easy to use.		✓*			
6. The multiplicity of visual advantages (e.g. animation, sound, icons, colors, size, and font) helps me to capture information.		✓*			
7. The colors used are pleasing		✓*			
8. The font size is clear		✓	*		
9. The menu system is easy to navigate		✓*			
10. The practices are intuitive		✓*			
11. The lessons are enjoyable.		✓			
12. The lessons make learning easy		✓*			
13. The lessons are easy to understand.		✓	*		
14. After using the tool, my Arabic skills improved.		*	✓		
15. The tool is encouraging me to learn Arabic.	✓*				

Learner 1 as symbol (✓), Learner 2 as symbol (*)

VII. CONCLUSION

Throughout this paper, CALL tool for teaching the Arabic language to adults was presented by interesting appearances, by using interactive ideas that give a positive start to the learners who aim at learning the Arabic language.

Furthermore, this system was supported by practices to allow the user to evaluate his/her understanding with the ability to score with his/her answers. According to the learner questioners, the tools seemed to have an extremely positive effect.

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