

Arabic E-learning and Computer Tools

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Abstract *This paper reviews software solutions which the authors use in the Arabic teaching, as well as problems related to the Arabic language formalization. These solutions are implemented both in full-time training and in e-learning programs. It also deals with the two types of e-learning portals used at the St. Petersburg State University, Russia as a main medium for the software tools: Sakai and IBM Workplace Collaborative Learning, as well as the principles of computer selection of the teaching material, advantages and difficulties of the software designed for the Arabic script. The authors also focus on the use of the standard software for purposes of education and analyze the experience of the e-courses for Arabic.*

Keywords: Arabic, e-learning, teaching, computer tools, formalization

1 Introduction

For the last decades the modern Arabic teaching approach has undergone through the significant changes. Thus, on the initial stage of the ICT implementation in education the world practice defined two different tendencies of the Arabic teaching approach: classic old school teaching and modern computer based education. However today we can speak about the existence of the teaching methods combining both educational approaches. The application of the specified hard and software, as well as fast evolution of Internet became an important part of the educational process. Although teachers do not always require applying modern technology instruments the students use hi-tech equipment anyway. Thus it makes the teachers follow the modern trends and be aware of the technologies available on the market, e-resources as well as skilfully apply their computer knowledge on practice. The above mentioned tendencies created necessity for the development of the advanced training program for the teachers of Arabic.

Therefore in 2010 the program called "The Arabic language and innovative education" was developed in St. Petersburg State University within the scope of the project headed by Professor Oleg Redkin.

The program is aimed to give the teachers of Arabic additional skills to improve their professional competence, such as:

- Skills to create digital teaching materials (e-books, presentations, multimedia applications, etc.);

- Knowledge of the alternative teaching methods (e-learning, use of ICT for teaching and so on);

- Use of e-resources in Arabic.

During the last two years more than 50 teachers of Arabic from different part of Russia have graduated from this program via videoconference based distant education.

The use of electronic resources and technical tools can significantly improve the quality of teaching process and provide maximum of information supplied to students in a limited period of time. In addition, electronic media also provide access to electronic resources and databases, etc., as well as electronic dictionaries online.

The last decades in the field of language teaching and research are characterized by deep methodological changes caused by intensive ICT development. Innovative hard- and software solutions upgrade effectiveness of the educational process along with the Internet which turned to be the main information source for linguists. Nowadays the quality of the educational programs and success of the scientific activity largely depend on the successful use of ICT in teaching and research.

Distance learning is a relatively new but rapidly growing area of educational cluster in Russia. The evidence of it is that on February 29 2011 (29.02.12) former President D. Medvedev signed amendments to the Federal law "On Education" stating that the "e-learning, distance education technologies can be used for the implementation of educational programs, regardless of the form of education".¹

As the perfect example we may review the projects that have been carried out at the Arabic Philology Department of St. Petersburg State University in Russia.

Although the teaching of Arabic at St. Petersburg State University has a long history, the authors try to use their experience and keep classical teaching methods in the implementation of the innovative programs. That classical education background gave birth to the spark of the innovative concepts, which resulted in the successful implementation of some projects, such as «Oriental Languages Distant Learning System», «A Mathematical Model of Pattern Recognition and Processing of Texts in Arabic Based on the Segmentation of Relevant Components», «Software Localization for the Near Eastern Consumer Markets» etc.

The project of the oriental language distant learning system development at St. Petersburg State University started in

¹ <http://kremlin.ru/acts/14625#sel=>

2006 within the scope of Federal Program targeted at the improvement of higher education system in Russia. The major part in the above mentioned Federal Project was dedicated to the development of the e-learning materials and necessary resources for oriental languages. As a result, we developed a complex of new e-learning text-books, which included sections on phonetics, morphology, syntax, vocabulary, supported by texts, video and audio fragments. Tests and reference materials allow to use e-learning technologies for all kind of education activity.

This paper reviews software solutions that we use in the Arabic teaching, as well as problems with the Arabic language formalization. These solutions are used both in full-time training and in e-learning programs.

2 E-learning portals

The use of computer technologies enhances the capabilities of both teachers and students, besides that, enables to transfer skills through a network based on various types of e-learning portals. So it was several years ago when a project aimed at development of teaching books and e-dictionaries for distance learning along with the introduction of a new teaching software and technologies was launched along with on-line retraining courses for Arabic teachers from different schools and universities.

Two types of e-learning portals were used at the University as a main medium for the software tools: Sakai and IBM Workplace Collaborative Learning. In the course of successful implementation of the Arabic material in both platforms we defined differences in the principle of their operation.

The main ideas of the “Oriental Languages Distant Learning System” project were focused on the development of the medium for e-learning and students’ communication, as well as on the development of the system for e-books scanning and storing in order to provide access to the e-library resources. The software part of the project was developed on the basis of the IBM platform.

IBM Workplace Collaboration Services was used for e-learning, means of the collaboration and e-mail access. IBM DB2 Content Manager was chosen for e-books and multimedia content storing, while audio and video conferencing activities were carried out using IBM Lotus Sametime.

From a user perspective this solution is a portal that consists of several sections. The access to the portal is realized via the department local computer network or via Internet. The e-learning courses were developed by teams of teachers and programmers working together on this project.



Figure 1. Example of the e-course in IBM Workplace Collaborative Learning. Mass media in Arabic.

A special attention was paid to practical exercises consisting of several types of tests, including the computer-verified tests and multiple choice tests. Development of the computer-verified tests for grammar could be regarded as a big achievement considering the difficulties associated with Arabic formalization. The e-courses were developed in SCORM format using the tools of IBM and Adobe.

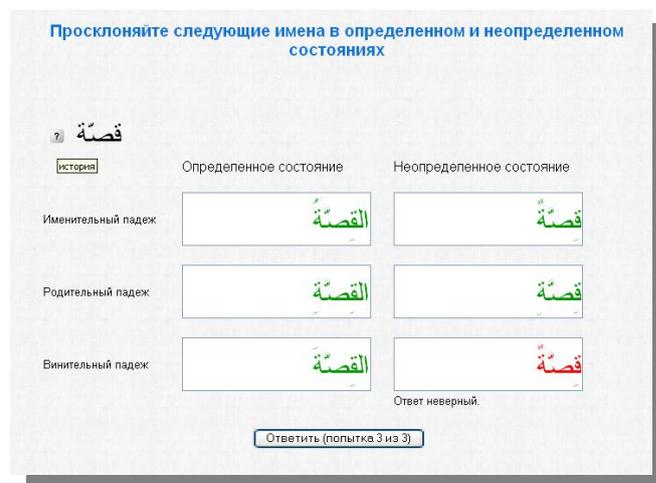


Figure 2. Example of the grammar test. The task was to decline the word “story”. System automatically verifies the answer, marking wrong answers with red.

Solutions for the e-library generation were especially important for the Department of Asian and African Studies, as it obtains huge collections of manuscripts that previously were difficult to analyze. The automated manuscript scanning complex was used to generate the e-library, the complex included manuscript scanner and special software for image processing. After scanning the librarian made bibliographical description and uploaded the e-copy of the manuscript into the storage, which in its turn was developed using IBM DB2 Content Manager.

Initial testing of e-learning system for educational purposes gave positive results, but after the project was finished we faced the problem of updating educational material – it was possible only with the help of programmers whose work was not budgeted any more. At the same time other e-learning platforms such as Sakai, allowed teachers to upload language material by themselves. Besides, when programmers customized courses for integration into IBM platform a lot of mistakes connected with the difficulties of Arabic adaptation were found and we had to test the integrated course several times. In order to facilitate integration of the materials in Arabic programmers used graphic files instead of simple text in Arabic. The latter made it impossible, for example, to mark necessary abstract or copy it to the e-dictionary. This greatly limited the possibilities of e-learning. These complaints related to the difficulties of IBM Workplace Collaborative Learning application were probably due to incorrect settings. However we just described our experience from a linguist point of view.

Sakai portal for e-courses in Arabic does not need any special programming skills and provides flexibility for e-learning. In comparison with the IBM Workplace Collaborative Learning it correctly displays Arabic graphic and allows performing all text processing operations. It has all necessary tools for collaborative work.

Modern technologies give e-learning new opportunities by using videoconferencing along with the medium for collaborative learning.



Figure 3. Videoconference system.

In addition to using the special video conferencing equipment we integrated the BigBlueButton into Sakai platform in order to deliver learning material to the remote students. Videoconference system provides audio and video teacher-student communication. Up to 12 participants can simultaneously take part in the discussions. BigBlueButton is a tool that was integrated to the Sakai platform

(<http://islamedu.spbu.ru>). Using this tool a teacher can communicate with students and has an opportunity to demonstrate presentations, pictures and other software applications from his own PC.

3 Windows Software for Arabic Data Processing

Selection and processing of the teaching content has the same importance as the choice of the software platform. Meanwhile, a number of peculiarities and special features of the Arabic text should be taken into account. For example, the previous versions of Windows (Windows 3.11. and Windows 95 – both English or Russian) represented certain difficulties for the realization of the Arabic script.

Special software products designed for “arabization” of Windows such as Sakhr or Dagesh were not fully compatible with the Windows 3.11 and Windows 95. It also did not provide a solution for all of the problems related to typing and processing of the Arabic text. At this stage partial solution was found in the simultaneous use of parallel computers with the Russian (or another language) and Arabic-supported Windows, or the use of a single computer operating with these two versions of Windows, while the language data were exchanged through a clipboard.

Such versions of Microsoft Windows (English or Russian), as Windows XP or Microsoft Windows 2000 and higher support Arabic, but still certain problems remain. Thus, copying the Arabic texts from the web pages or special software to the clipboard often transferring to the final document is often accompanied by numerous mistakes – incorrect realization of word order, alignment, character shapes, as well as vowel and special signs.

There are also difficulties of the integration of Arabic script into the texts based on Cyrillic or Latin alphabet. These minor difficulties (direction of the cursor, realization of consonant characters and vowel signs) can be solved by installation of the Arabic text support or additional fonts.

Similar problems of the realization of the Arabic text are typical to mobile devices with operational systems based on Windows Mobile and Linux. These operating systems require the use of applications that allow software to adapt the device to applications in Arabic.

Along with Microsoft Office Word, Microsoft PowerPoint is another effective tool for development of interactive language courses. In addition to its relatively low cost and simplicity another advantage of this software is its optional features. Various aspects of the language training are optimized by means of animation. It can be used by the teacher himself/herself without any help from technicians and it simplifies and accelerates the development of educational software products. Besides, the combination of independent material allows the instructor to emphasize the

new teaching material and to develop language tests. Integrated video and audio files, visual effects aimed at the creation of the associative links support language acquisition in general and vocabulary in particular and contribute to the development of communicative skills of the students. Another advantage of this program is that it supports scripts of major oriental languages (Arabic, Chinese, Japanese, etc.).

Besides teacher's skills, experience and software, the linguistic content especially the vocabulary of the courses online plays a vital role in the e-learning. Meanwhile, except for the specialized dictionaries, the authors do not explain or stipulate the principles of the formation of the linguistic content and reflect author's personal attitudes and experience.

The authors have developed computerized methods of the definition of the frequency code of the Arabic words, i.e. the number the word entrances in the entire text on the basis of the analysis of some 1 million words from various texts in Arabic.

It allows us to include the most frequent words into the linguistic content of the text-books. The vocabulary of the text-books based on the principle of the frequency code proved to be very useful, especially on the initial stages of studying Arabic.

4 Conclusions

Basing on the experience of several projects related to the development of the e-courses for Arabic we came to the following conclusions:

4.1 The most effective methodology for the Arabic teaching relies upon simultaneous use of classical language teaching and ICT. The latter includes media for collaborative work, office editors (such as Microsoft Office, MS Excel, MS Power Point, etc.), e-libraries.

4.2 Comparisons of different types of e-learning portals for e-learning showed their similarity in the basic tools and differences in the e-learning courses implementation approach. Meanwhile among the existing platforms for Arabic the most convenient one is Sakai which allows to reflect the peculiarities of the Arabic text adequately. Another platforms are not so accurate while representing Arabic characters.

4.3 The problems of the Arabic language technological adaptation are manifested in several areas: the graphical representation - covers all uses of written language, language data processing aimed at ensuring the functions of machine translation and related problems of formation of concordance word forms and their construction to the word-based.

4.4 Among the strengths and benefits of computer tools are vast reference resources for academic pursuits, teacher's control which spreads beyond the classroom. The weak point is the lack of personal 'eye to eye' contact.

Among the advantages of the e-learning one can also mention its simplicity and possibility of solving the problems, regardless of the computer skills of the students participating in the program, as well as the ability to work in real time and embrace the most remote regions.

The full-time students can also enjoy the advantages of distance learning and can use teaching materials and home assignments on the web.

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