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# Using wiki in the design of bilingual online course

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**Abstract**

The aim of the study was to develop the web-based teaching course for use in the process of Information and communication technology learning by the Tatar-speaking students. The first-year students of Higher School of Tatar Philology and Intercultural Communication of Kazan Federal University took part in the experiment. They were divided into two groups. The experimental group consisted of 25 trainees and control group included 25 students. The educational experiment was carried out during one semester of the academic year 2015/16 and 2016/17. In teaching of the subject 'Computer Science' (36 hours), the technology CLIL K1 and Web 2.0-based training materials were used in the experimental group. Processing of the results with the help of statistical methods led to the conclusion that the positive changes in the experimental group were due to CLIL-assisted training, using teaching materials, developed on the basis of Web 2.0 technologies K1.

**Keywords**: Web 2.0, the Tatar language, the Russian language, adoptive language, learning content, wiki.

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## 1. Introduction

Information and communication technology has become an integral part of our everyday lives. Schools should, therefore, respond to the current social requirements and prepare individuals in accordance with the needs of an emerging information society (Uhlirova, 2018)

Wikis are collaborative Web-based environments that allow multiple users to easily and quickly contribute content. They are dynamic, constantly changing Web pages where readers become authors and editors. Wikis are a Web 2.0 application, which allow for 'distributed participation and collaboration' (Knobel & Lankshear, 2006, p. 81).

As we were redesigning and building our new Libraries intranet site last summer and fall, we started experimenting with wikis. Wikis are online collaborative communities that lend themselves to continuous editing and refinement of content. They work best at aggregating and distilling shared knowledge and include the ability to track article evolution so that content often reflects a blend of voices. As mentioned earlier, we followed the news about Wikipedia and reviewed other research-focused wikis that might offer potential resources for our editorial groups. Many wikis aggregate collections of knowledge and are good starting points for understanding a topic or finding links to additional resources. So, we began teaching our patrons about these exploding social applications, pointing them to potential research sources (Huffman, 2017).

Online information aggregation projects, of which Wikipedia is an exemplar, can inspire new directions in the survey research. These projects, which are built from crowdsourced, user-generated content, tend to share certain properties that are not characteristics of traditional surveys (Benkler, 2006; Nielsen, 2012). These properties guide our development of wiki surveys. In particular, we propose that wiki surveys should follow three general principles: they should be greedy, collaborative and adaptive.

In many large universities (both domestic and foreign), special programs are created to support the design of online courses and development of new instrumental e-learning systems. Banks of multimedia lectures and online courses, electronic textbooks, specialised electronic libraries and other facilities are formed. For example, in Kazan Federal University, learning management system Moodle includes the courses for a wide range of disciplines, taught at the university. Any teacher has the opportunity to create own e-course and use it for educational purposes.

It is obvious that in the conditions of informatisation, there is a radical change in the matter of teacher's activities. Modern teacher becomes some kind of analyst and manager of information resources; the designer and developer of a course, a lesson, a fragment of lesson, with the use of interactive tools; the researcher of the effectiveness of created course (Choshanov, 2016).

However, the use of new technological solutions in the educational process brings not only positive changes but also problems. The main problem is that most teachers, who develop online courses, consider the platforms for courses only as a carrier of information. The review of open courses shows that most of them are only the consistent collection of text materials. Many of the functional capabilities of platforms are not used (Jaschik, 2013).

As already mentioned above, the process of learning, using the Internet, has gained particular popularity. In fact, the 'traditional' use of the Internet in training comes down to the creation of educational resource on the Internet, the adjustment of its functionality and the further use of created source by students and teachers. The main advantage of this technology is the availability of resource (to access the resource, you need only an Internet connection) and the freedom from attachment to any hardware or software platform (to use the resource, the student must only launch a browser and not install third-party software). The spread of the Internet has favourably influenced on the development of distance learning. In order to expand online services, leading world universities create consortia of mass open online courses—MOOC (for example, Coursera, Udacity and edX) with the aim to initiate special programs to support the development and carrying out of online courses,

and also for the creation of new tools for online tutorial systems (Syunina, Yarmakeev, Shechter, Pimenova & Abdrafikova, 2017).

Based on the foregoing, it is necessary:

1) to develop own criteria for the selection of educational online platforms;
2) to develop a bilingual online course 'Computer Science in a bilingual manner (Russian-Tatar)' on the chosen platform;
3) to assess the effectiveness of developed online course in the formation of computer literacy of bilingual students.

## 2. Methods

The online course 'Computer Science in a bilingual manner (Russian-Tatar)' is a part of the electronic support system for bilingual education in the discipline 'computer science'. The purpose of which is to develop computer literacy of bilingual students. When developing the online course for the creation of effective learning environment, we relied on the recommendations of Choshanov (2016). The process of course development consisted of several stages (see Figure 1):

- The stage of creation of training products/technologies, which includes three sub-stages:
  - The analysis of training products/technologies;
  - Design of training products/technologies (logical implementation);
  - Development of training products/technologies (physical implementation);
- The assessment of effectiveness of training products/technologies.

The analysis of training products was carried out. Nowadays, there is a rapid development of market of e-learning resources. In particular, such materials are also created for the Tatar-speaking audience (Khusainov & Khusainova, 2016). For example, the site 'Tatarname' (Batrova, Danilov, Lukoyanova & Khusainova, 2014) contains hypertext books and dictionaries for the Tatar language beginners. The website 'Belem.ru' (http://www.tatar.com) is devoted to the education in the Tatar language. However, many high-quality online resources are created with significant financial support, and using specialised hardware and software. An ordinary teacher has no opportunity to create his own resources, similar to those, described above. In order to create your own educational Internet resource with rich functionality, it will be necessary to rent and adjust network equipment and software, to develop the resource, using programming languages, to create a design layout of the resource, and to maintain user support. Therefore, it is more expedient to create Internet resources on universal platforms, compromising between functionality and ease of use (Batrova & Salyekhova, 2015).

### *2.1. . Material design*

The developed e-course consists of seven training modules, each of which is devoted to a specific subject area:

1. Introduction to computer science and structure of PC (*Информатика фәненә кереш һәм персональ санак төзелеше)*;
2. Operating systems. Microsoft Windows 7 (*Операцион системалар. Microsoft Windows 7 системасы*);
3. Computer networks and the Internet (*Санак челтәләре һәм Интернет*);
4. E-mail and search systems (*Электрон хат алышу һәм эзләү системалары*);
5. Text editors and processors. Microsoft Office Word 2010 (*Текст редакторлары һәм процессорлары. Microsoft Office Word 2010 текст процессоры*);

6. Tabular processors. Microsoft Office Excel 2010 (*Таблица процессорлары. Microsoft Office Excel 2010 таблица процессоры*);
7. Presentations. Microsoft Office PowerPoint 2010 (*Презентацияләр. Microsoft Office PowerPoint 2010 программасы*).

The topics of modules correspond to the international requirements for computer literacy. They are chosen in such a way that the knowledge, generated in the process of their study, allows for the formation and development of information competence of philology students, identified in the Federal State Educational Standard of Higher Education. Each module contains theoretical and practical parts, as well as illustrative material. Theoretical foundations of the discipline 'Computer Science' are set out in the theoretical part. The practical part includes laboratory works on the topic under study (Yakaeva, Salekhova, Kuperman & Grigorieva, 2017).

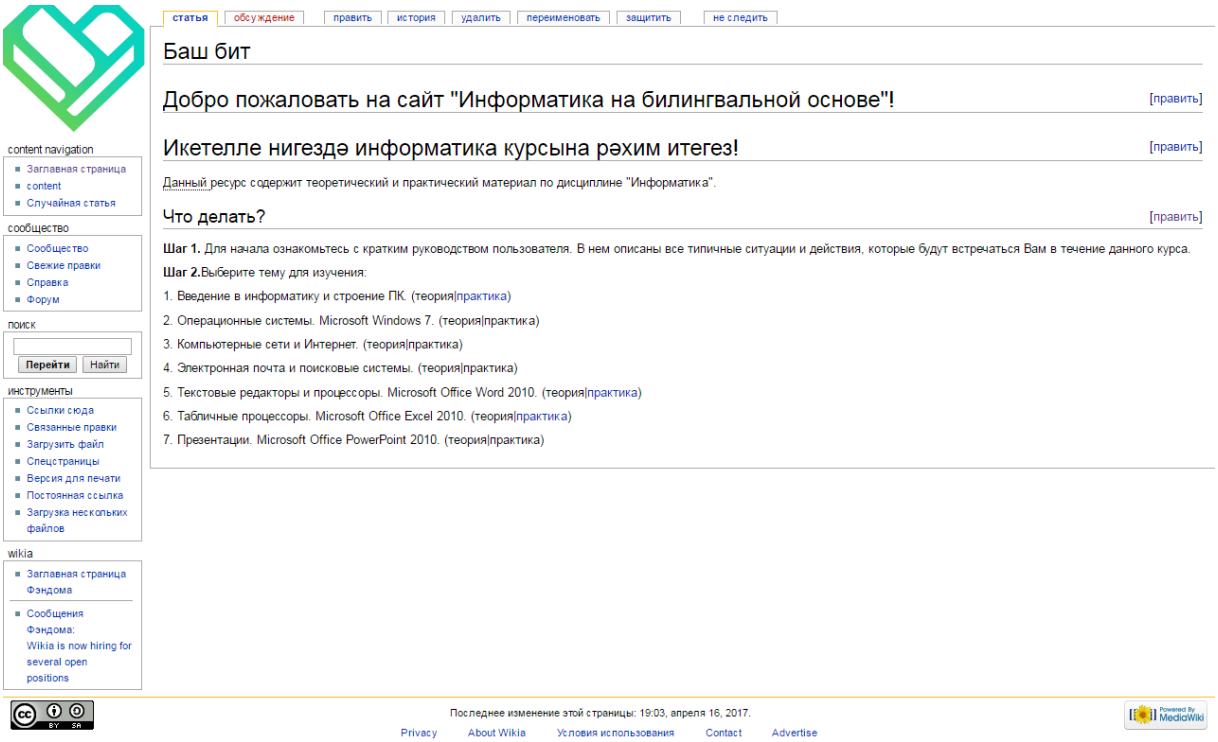


**Figure 1. The homepage of wiki-based online course 'Computer Science in a bilingual manner'**

The process of creation of training materials on Wikia resource included the stages of design and development of learning materials. The first stage consisted in the preparation of laboratory work, modelling the structure of the material and designing of tasks.

At the stage of development, wiki pages were created. Resource Wikia has two modes of operation for the formation and editing of pages:

- simplified mode of operation (visual editor), when the content is edited in WYSIWYG[1]—to change the design of a fragment, you should select the area to be changed, and click on the appropriate icon (see Figure 2);

[1] WYSIWYG—is the technology of documents construction, which immediately displays the appearance of the edited document. The term is an acronym for 'What You See Is What You Get'.

- enhanced mode (source editor), which provides ample opportunities to customise the appearance of page. In this mode of operation, participants must use the elements of wiki markup language to customise the appearance of a fragment.

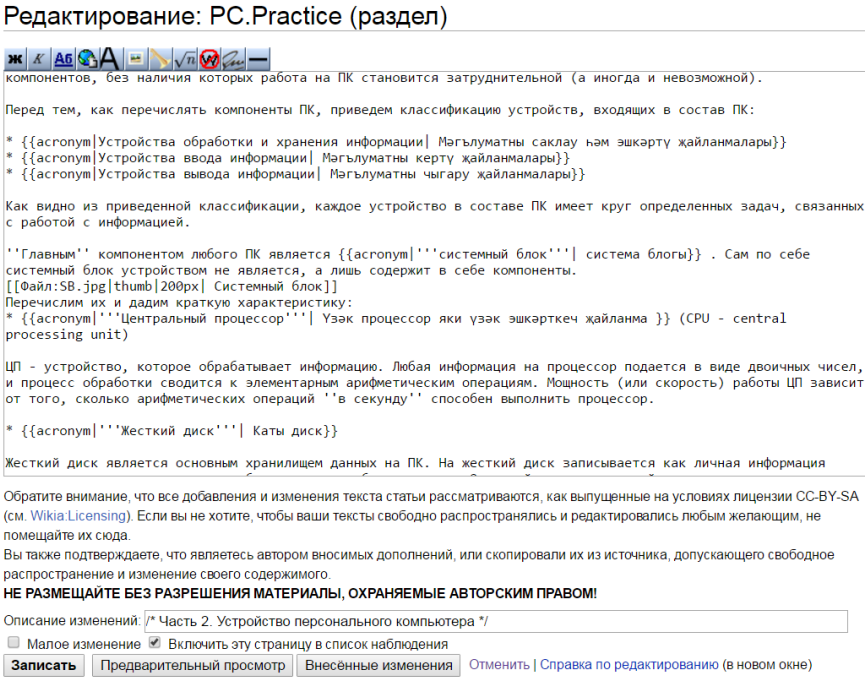


**Figure 2. Editing the course content via wiki-markup**

It was necessary to visualise the training content in order to minimise the cognitive and linguistic difficulties, faced by bilingual students, when learning in non-native (Russian) language. The process of visualisation is a very important process of creation of training material. Visualisation involves the use of a visual form of knowledge representation (abstract signs, visual diagrams, specific objects, etc.) instead of/along with verbal support (Skemp, 2006).

In the process of design and development of electronic learning support systems, various means of visualisation were used.

The developed training materials use GIF-animation, created by screencasting technology (Danilov, 2014). The teacher's actions are recorded from a computer program (for example, selection of the necessary function in the program interface, performing a series of operations). After that, the recorded fragment is mounted and inserted into the lesson. This solution allows to get rid of redundant verbal commenting.

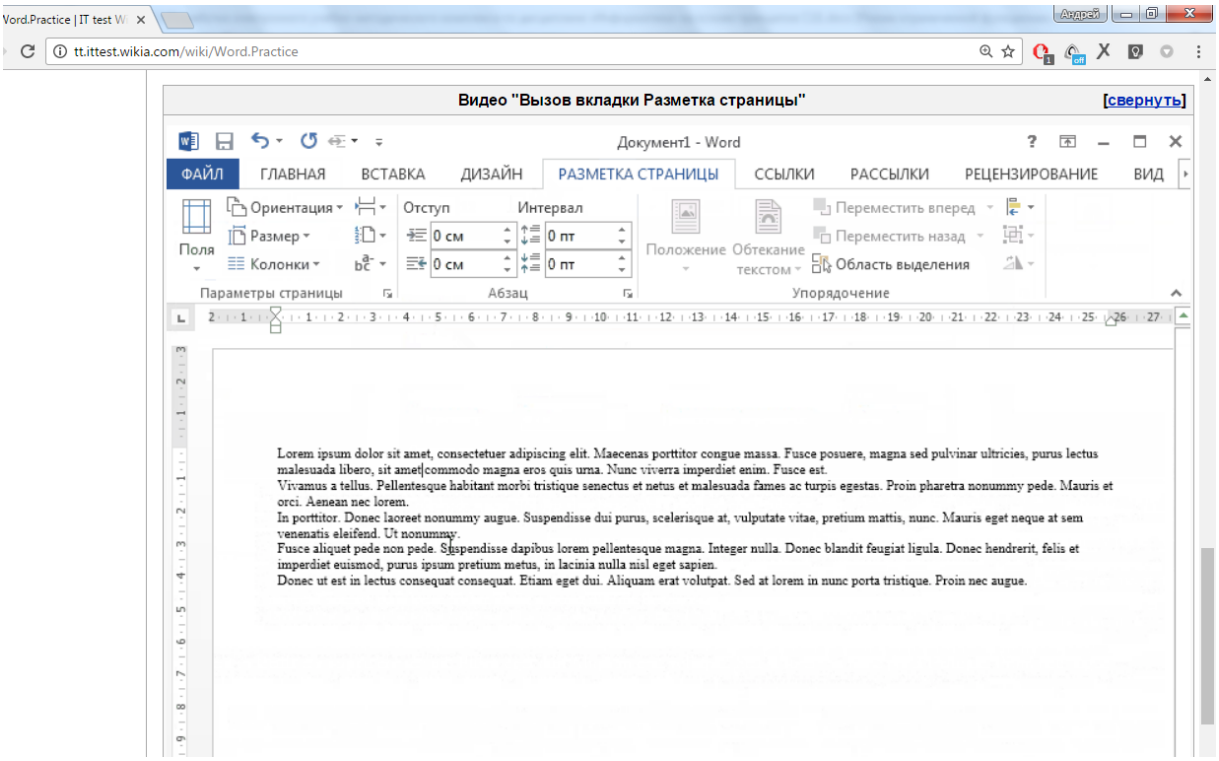


**Figure 3. Screencasting in the online course**

Also, the own complex visual elements were developed, using wiki markup language:

- collapsible tables, in the cells of which there are illustrative materials. In order to view the content of the cell, the student must click on a particular button, and the content of the table appears. At any time, one can 'collapse' the table (Figure 5). This solution allows to save visual space on the monitor (mobile device), as well as to improve the visibility of material.

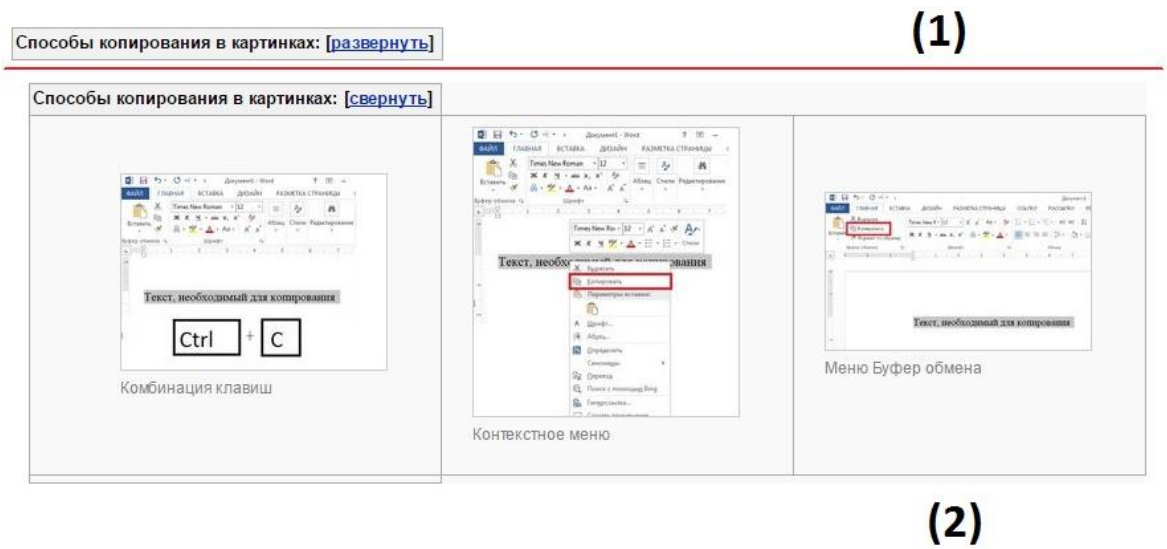


**Figure 4. Collapsible tables in the online course**

- 'acronyms'—this element is a piece of text, which displays a 'hint', when you mouse over it (Figure 6). It was used to display the Russian-Tatar translation of terms and expressions from

Russian into Tatar. This technical solution is an alternative to the use of terminological dictionary. To translate a term, it is necessary only to move the cursor over a word, the translation of the expression from Russian into Tatar is displayed.

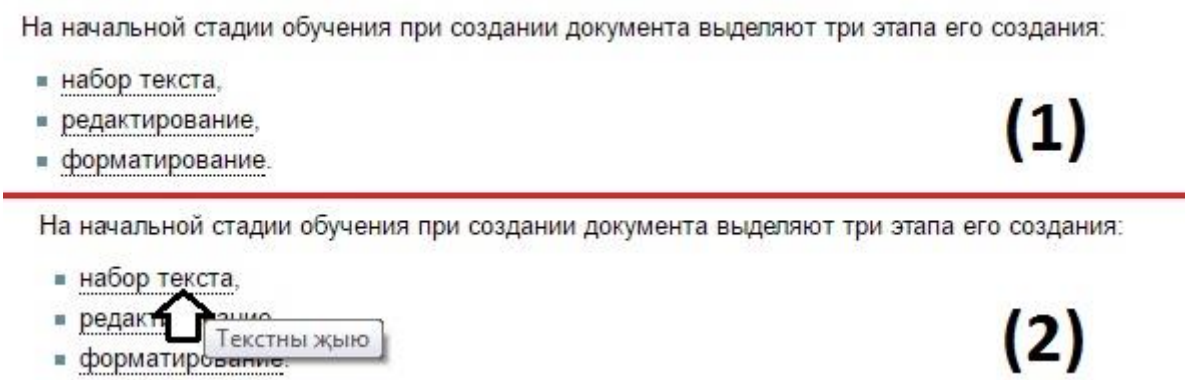


**Figure 5. Acronyms in the online course**

Also, the feedback technology is implemented in training materials. Using this technology, resource users have the opportunity to leave comments on the published material. In our case, students used comments for communication with the teacher and other students, in a situation when it was necessary to get an explanation on the performance of laboratory work. At the same time, students themselves often answered questions from their comrades. The feedback technology allowed the creation of a virtual bilingual communication environment, where students used Russian and Tatar languages for communication, for academic purposes and for solving educational problems within the framework of the discipline 'Computer Science'.

## 3. Results and discussion

When choosing a technology platform for developing an online course, we were guided by the following criteria:

1. The technology platform should provide the teacher with rich functionality for developing educational material. This requirement implies that the platform should support different formats and types of information provision.
2. The technology platform should provide easiness in development of educational material, i.e., the creation of educational material should not require special technical skills from the teacher.

Such a decision, in our opinion, is the choice of Web 2.0 resources.

Web 2.0 is a means for making content on the Internet, in which information is created, completed and edited by the users of this Internet resource. Moderators and administrators of Internet resources in this case provide only a service and a technical platform, but at the same time they do not participate in the process of its filling with content (http://belem.ru). Web 2.0 resources are widely used not only in everyday life, but also in education. According to Tim O'Reilly, 'Web 2.0 is a technique for designing such systems, which after the consideration of network interactions, become better, when greater number of people use them'.

Any Web 2.0 service has some or all kinds of learning interactivity, and in some cases, their implementation is expressed in a specific way. Therefore, to determine the optimal Web 2.0 service for solving the set tasks, various types of Web 2.0 services were analysed.

For the analysis, the classification of Web 2.0 services, proposed by Titova (2009) was used. This classification identifies five types of learning interactivity of the online and mixed modes of study:

temporal, sequential, contensive, creative interactivity and feedback interactivity. Comparative description of the interactivity models of Web 2.0 services, based on their technical characteristics and capabilities, is presented in Table 1 (Mehisto, 2012).

**Table 1. Web 2.0 tools and features of interactivity**

| Interactivity pattern | Wiki | Blog | Social Media | Learning Management System |
|---|---|---|---|---|
| Feedback | Comments, discussion pages, private messages | Comments, private messages | Comments, forums, private messages | Forums, private messages |
| Course layout | Flexible content layout created by wiki markup | Tags | — | Changing course structure by teacher |
| Access | Access to course from everywhere via Internet. Ability to post comments and content for community | | | |
| Creativity | Publication of any type multimedia content including results of independent work, composing a text | | Composing a text | — |
| Content | Regulation of content with wiki framework | Providing excess course content for self-study of students | | |

Based on the analysis of various Web 2.0 services and their functionality, Wiki technology was chosen as the most optimal solution for the creation of learning platform. Resource Wikia was selected for the design and development of training materials (http://wikia.com). The resource is a site on MediaWiki platform. This platform has wide technical capabilities for the creation and disposition of content, for formatting and composition of text material, placement and working with multimedia (images, audio and video information). It allows to integrate materials from third-party popular Internet services (for example, video hosting service YouTube). An important feature of this service is its interactivity. The use of this source is possible, both on a personal computer and on mobile devices.

According to the principles of didactic engineering, the next steps in the creation of a training product are the development and design of the product.

## 4. Conclusion

The final step in the creation of training product is the control of its quality. For this purpose, pedagogical experiment was conducted. Its aim was to check the effectiveness of formation of computer literacy of Tatar-speaking students, using the created e-course. The experimental base was the Institute of Philology and Intercultural Communication of Kazan Federal University.

The first-year students of Higher School of Tatar Philology and Intercultural Communication participated in the experiment. They were divided into the control and experimental groups. The experiment has been carried out for 2 years. In contrast to the control group, in the experimental group the formation of computer literacy was implemented by means of the Russian and Tatar languages and the system of electronic support, the central component of which was the e-course, developed using Wiki technology.

At the control stage of the experiment, final testing was carried out. It included a set of tasks, aimed at identifying the level of formation of computer literacy among the students. Statistical processing of test results showed that the empirical value of the Wilcoxon–Mann–Whitney criteria Wemp = 7.14 was strictly greater than the value, critical for the level of significance $\alpha = 0.05$ (Wcr = 1.96). Consequently, the significance of differences in the compared characteristics in the

experimental and control groups was 95%. It can be concluded that the positive changes in the experimental group are observed due to the training with the application of e-course 'Computer Science in a bilingual manner (Russian-Tatar)', created using Wiki technology.

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