Creation of an electronic trilingual dictionary of biological terms with linguoculturological components

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Abstract

Digitization of educational system of the Republic of
Kazakhstan, coupled with the Trilingualism program, has revealed the
problem of the lack of trilingual training and resource books and, as a
result, their mass creation in electronic form. This article deals with the
experience of creating a disk version of an electronic trilingual
dictionary of biological terms with a linguoculturological component
using the Adobe Dreamweaver program. The experience of application
and use based on a survey of teachers suggests that Adobe

Dreamweaver is ideal for visualizing the linguoculturological component of the term in order to effectively memorize the latter.

Keywords: Electronic trilingual dictionary, Linguistic and cultural component, Cognitive skills, Adobe Dreamweaver, Visualization.

Creación de un diccionario electrónico trilingüe de términos biológicos con componentes linguoculturológicos

Resumen

La digitalización del sistema educativo de la República de Kazajstán, junto con el programa de trilingüismo, ha revelado el problema de la falta de capacitación trilingüe y libros de recursos y, como resultado, su creación masiva en forma electrónica. Este artículo trata sobre la experiencia de crear una versión en disco de un diccionario electrónico trilingüe de términos biológicos con un componente linguoculturológico utilizando el programa Adobe Dreamweaver. La experiencia de aplicación y uso basada en una encuesta de docentes sugiere que Adobe Dreamweaver es ideal para visualizar el componente linguoculturológico del término con el fin de memorizar efectivamente este último.

Palabras clave: Diccionario electrónico trilingüe, Componente lingüístico y cultural, Habilidades cognitivas, Adobe Dreamweaver, Visualización.

1. INTRODUCTION

Informatization of the educational process suggests the use of computer technology. The fundamental knowledge in creating multimedia projects allows teachers to elaborate electronic lessons and related electronic materials that enhance the cognitive skills of teachers

and, at the same time, provide everything necessary for the lesson. The rapid development of science leads to the rapid obsolescence and loss of relevance of technology, making teachers look for new programs to creating electronic educational resources. The education system in the Republic of Kazakhstan is undergoing fundamental changes and modernization not only in the field of applied technologies but also in the field of education through the implementation of the cultural project *The Trinity of Languages*, within the framework of which it is necessary to develop three languages: Kazakh as the state language, Russian as the language of international communication and English as the language of successful integration into the global economy [1].

A trilingual education should combine the basic laws of linguistics and the laws of language development through teaching in this language [2, P. 72-92]. Natural disciplines such as biology, chemistry and physics which the teachers of Kazakhstan schools are now to teach in English have been determined [3, P. 1698-1706; 4, P. 23-40]

According to A. B. RAISOVA, it will be extremely difficult to fully implement without providing teachers with didactic tools, which are educational and methodical complexes (EMC), containing curricula, textbooks, study guides, trilingual terminological dictionaries, workbooks on language disciplines, and multimedia resources such as language centers, the global Internet, satellite television and digital libraries [5]. Analysis of the data on the availability of such didactic materials allows for the establishment of

the fact of practical absence of textbooks and teaching aids in non-linguistic disciplines taught in a second language [5]. This fact is confirmed by M. Y. ISHMURATOVA, dedicating one of her works to the analysis of the provision of schools in the Republic of Kazakhstan with trilingual dictionaries [6. P. 341-346].

At the same time, K. T. BAINIEVA and A. Z. UMURZAKOVA emphasize a significant lack of relevant trilingual dictionaries in schools and universities throughout Kazakhstan [7. P. 776-779]. They contend that the acquisition of communicative and linguistic competencies under the conditions of trilingualism directly depends on the size of vocabulary built in all three languages, and therefore the use of trilingual dictionaries in teaching disciplines will help improve the level of Kazakh, Russian and English [7, P. 776-779]. Moreover, the Bologna process makes it necessary to create and use electronic educational resources in order to develop the sociocultural and linguistic competencies of students [8. P. 127-134]. It was the lack of multilingual resources in education that triggered the project implementation of funded by the Ministry of Education and Science of the Republic of Kazakhstan Creation of a Trilingual Dictionary of Biological Terms with a Linguoculturological *Component*. The focus on digitalization is reflected in the tasks of the project, among which the creation of an electronic version of the dictionary has become obligatory [9, P. 317-321].

The creation and use of electronic dictionaries in Kazakhstan educational institutions is becoming relevant today, thanks to the

visual component of these products, convenient delivery of the material and its classification. The greatest virtue of electronic dictionaries is the possibility to store data for future use and add content as needed. Another advantage of electronic dictionaries is their compactness: modern technologies allow to comprise the maximum amount of information in a limited space. And finally, electronic dictionaries provide an instant search for the required information: the need to turn pages is replaced by the ability to search for a desired word in the search window. However, the creation of electronic dictionaries does not have clear instructions or rules, which is precisely an essential drawback.

The research team of the project made a study of a software that would meet both the tasks and the resource base available to scientists. The need for an electronic type of dictionary is determined by the fact that with the advent of access to the global network, the phenomenon of open education has developed. In turn, the implementation of the principles of distance learning required the popularization of the potential of modern technology among teachers of schools and universities. This includes a wide range of possibilities, from compiling online courses to creating websites. According to V. A. KALACHEV and O. I. OVCHARENKO, information and educational platforms can be created using the same tools as websites [10. P. 315-316].

And since the site may be considered to be an electronic publication of any content and size available on the Internet,

made using a certain set of web technologies, it is difficult to overestimate the use of these technologies to provide information and the emotional impact on the student [10. P. 315-316].

A linguoculturological component in dictionary entries becomes necessary underway the project. Language cannot be used, explained or described in isolation from the worldview of its native speakers. Linguoculturological dictionaries are an optional that allows for the familiarization with a lexical unit not only in translation but also in a cultural context. Despite the fact that the terminological dictionary implies purely scientific terminology, the school biology course comprises a wide variety of words that are not synthetic terms of science but involve a culturally rich background. The tasks of education in Kazakhstan are the creation of a multicultural personality, and this implies not only knowledge of grammatical structures and language units but also understanding of the cultural characteristics reflected in the language. In other words, the modern concept of multilingual education aims at preparing schoolchildren for full coexistence in the intercultural world through linguistic means [11, P. 797-805].

The appearance of linguoculturological dictionaries [12-22] is determined by the behavioral characteristics of the dictionary in the context of intercultural communication, which are characterized by both partial and complete loss of information in the content of the lexical unit when translating it into foreign languages [23, P. 30-46]. In order to choose an optimal format of the dictionary, taking into

account all its features, and a software capable of implementing it, the project team members have carried out an extensive work to analyze the existing literature, as well as the existing electronic and multilingual dictionaries. The statistics of the provision of secondary schools of the Republic of Kazakhstan has been also studied in order to outline the range of possibilities for future consumers of electronic vocabulary. Based on the data obtained in the first stages, a comparative analysis of the software for creating electronic educational resources is performed.

Despite the fact that Kazakhstan universities and schools have long switched to Western-style education, educational institutions do not always keep pace with modernization, planned "on paper".

In the system of higher education of the Republic of Kazakhstan, compliance with international standards of the credit system is only formally observed: departments fight for hours, students are deprived of the right to choose an individual trajectory because teachers traditionally work with groups, and not individually with each, three credit discipline is studied for one semester, it is not clear how to deal with works in the Kazakh language that do not have translated versions in serious rating publications [24, P. 97-100].

Thus, educational institutions need not only well-considered educational and methodological support but also the resources that would make it possible to fully implement the principles of a student-centered approach and completely abandon the old system of educational organization. Information technology is a tool that can help the modern education system.

2. METHODOLOGY

Imagining the situation on the ground, in rural and small schools, prevailing in the statistics of the Republic of Kazakhstan, the research group concludes that CD or DVD formats are more suitable for realizing electronic vocabulary than websites. Adobe Dreamweaver enables to create simple tutorial materials. The disadvantages of Adobe Dreamweaver include the high price and distribution only on a subscription basis. However, these disadvantages do not detract from the importance of the program for the development of various educational resources.

Having fully made certain of the reasonableness of the choice of Adobe Dreamweaver for creating an electronic trilingual dictionary of biological terms, our research group have developed the stages of compiling the dictionary:

1) Selecting biological terms with their subsequent translation into Kazakh and English.

2) Designing the dictionary, defining its functionality and its realization.

3) Developing the design of a trilingual dictionary of biological terms: the introduction of the logo of the future dictionary in the program Adobe Dreamweaver using the accompanying

programs that are applied to create the layout of the dictionary, the selection of color array and graphic content.

4) Creating a dictionary layout: the adoption of the logical structure of the dictionary – the order that determines the logical location of the resource pages and its individual parts. The main page of the dictionary includes the English-Russian-Kazakh, Russian-English-Kazakh and Kazakh-English-Russian dictionary of biological terms necessary for understanding the material and conducting lessons in the English, state and Russian languages.

The selection of the biological terms of the school biology course was carried out from biology textbooks of grades 6–11 for the old educational system (the Mektep and Atamұra Publishing Houses) (listed in Appendix 1, Paragraphs 1–16], grades 7–11 for the updated program (The Atamұra Publishing House) for accessible glossaries, reference books, manuals, electronic materials (see Appendix 1, Paragraphs 17-39) manually, based on the relationship of lexicographic material to the designation of the concepts included in the system of nominations in the field of biological knowledge [39. P. 76-84]. The main principle of the vocabulary selection was adopted on the basis of frequency, that is, the number of terms used in textbooks for the school biology course. The analysis of the terms was based on the occurrence of specific terminology in separate sections, as well as on the basis of the sameness of pronunciation in all three languages.

The linguocultural component is given separately as an application in the vocabulary. In the electronic version of the dictionary it is added without fail to each term where possible. At the moment, 1650 words have a linguoculturological component. The selection of linguoculturological comments is of a different nature, taking into account reference sources [40] and resources of online phraseological dictionaries [41-42].

1.The origin of a word from other languages, transformation and modern meaning. Example: the term *выпь*. An ancient word, among the Slavic languages it is known only in the Russian language

Образовано с пом. перегласовки и темы ь (> ř) от той же основы, что и вопить, вопль. Является родственным латышск. Ũpis –«филин», др.-исл. úfr «ночная сова», др.-в.-нем. Ûfo. Самцы в период гнездования издают глубокий крик, похожий на рёв быка. Отсюда и название выпь [43, P.66].

2 The use of a term in modern culture or in history. For example: the term *антибиотик* is used in fiction and cinema – *The Criminal Underworld of St. Petersburg*, where it means a criminal authority. The word *воробей* in relation to a person means small stature, modest size, weakness. In cinema, the word *воробей* designates a pirate – Jack Sparrow [44].

3. The symbolization of the names of the biological term in the culture of peoples. For example: According to ancient Greek

legend, "dolphin" was called the animal that Apollo turned into to show people the way to Delphi where the famous Delphic oracle and temple were later founded [45].

4.The meaning of the term in other sciences. For example: the word *киль*:

1). Основной продольный брус, проходящий от носовой до кормовой оконечности судна посредине днища; 2). Вертикальная часть хвостового оперения самолета или дирижабля; 3). Вырост грудины, служащий для дополнительного прикрепления грудных мышц у птиц и некоторых млекопитающих [46].

5.The use of a linguistic world image. For example: In the Kazakh linguistic image, the name *бозторғай* boztorғai (lit. *боз "сизый"* (gray-haired) + *торғай "воробей"* (sparrow)) - a lark reflects the classification of a bird, and there is also an indication of color, i.e. "songbird of the sparrow squad". Another meaning of the word *lark* is *проказничать, забавляться* (to play pranks, to amuse oneself). After all, these birds can sing loudly all day, being high in the sky above the field. In Russian, the bird got its name from the scream " жа< га." The word *lark* refers to people who get up early in the morning [48].

6.The semantic properties of the word [49, P. 78-84]. For example: the word *кенгуру* (kangaroo): 1) a marsupial Australian animal with extremely long hind legs and very short front legs, moving in leaps; 2) legal in the UK, a technique from parliamentary practice, consisting in the fact that the speaker at the stage of the bill report determines which amendments from the number proposed to the bill to be discussed and which not; 3) econ. a bond issued in Australia by a foreign borrower [50].

7.Phraseological units with a biological term. For example: set expressions about a goat: *как от козла молока* (be of little use); *пустить козла в огород* (allow one to act where one can do harm); *козел отпущения* (the person on whom someone else's blame is put); to tear a goat (singing very badly, in an unpleasant voice); hammer a goat (play dominoes); *встать на козла* (raise the front wheel of a bicycle, motorcycle, etc. while riding); *на козе не подъедешь* (it is impossible to find an approach to someone); *на кривой козе не обскачешь* (you cannot fool or deceive anyone); *отставной козы барабанщик* (a person who does not deserve respect, attention, unwanted) [51, P. 90, 164, 343].

8. The use of an object designated by a term. For example: Хотя плоды морошки по своему строению похожи на плоды малины, но отдельные составляющие частички плода гораздо крупнее, чем у малины, и окраска другая: «в начале созревания ягоды бывают красными, в полной

зрелости они оранжевые, точно восковые. Зрелые плоды морошки, содержащие от 3 до 6 % сахара, лимонную и яблочную кислоту, имеют приятный вкус и высоко ценятся местными жителями», которые собирают их в тундре в большом количестве, употребляют в пищу главным образом в пареном и мочёном виде, варят варенье [52].

9. Association to the term as an endless stream of information throughout a person's life [53, P. 206-242]. Modern lexicography cannot ignore the discrepancy between the psychology of a word for a native speaker and the presentation of its content in an entry [54, P. 182]. Associations provide a unique opportunity to see the rich world of emotions and ideas associated with a particular word and reflecting the national and cultural characteristics of the one who perceives this word. For example, for Russians, the word *гнев* (anger) can be associated with both cruelty and justice. Among the British, "anger" is often associated with disgust and pity [55, p. 139-162].

3. RESULTS AND DISCUSSION

Within the framework of the project, lexicographic material was sampled in the context of multilingual education; eliciting the basic principles of organizing a trilingual dictionary (Russian-Kazakh-English) of biological terms of a school biology course in the form of a printed publication, on a disk drive and as an online resource, for ease

of use and compliance with the school curriculum; an electronic version of the dictionary is created with a rich database of video, photos and audio data of a linguoculturological character based on the integration of modern technologies and the latest ideas of theoretical and applied lexicography.

At the design stage of the electronic dictionary, all information was structured in five main areas: ecology and evolutionary doctrine; genetics, biotechnology and molecular biology; botany; zoology; human anatomy and physiology. In each area, it was necessary to consider the possibility of searching for terms that will be presented in alphabetical order, as well as viewing their translation in Kazakh and English. The fundamental factor in the development of the dictionary was the choice of direction, and then the language, after which the term would be searched alphabetically and translated into other languages. The active search system for a term included in the existing database determined the desired term, followed by a visual review of its linguoculturological component in three languages.

To develop the design of the dictionary, we have used the graphic program Adobe Photoshop, which is a computer graphics tool used for all types of processing of media files. The advantage of choosing this program is that when using it, it is possible to adjust the image, improve its perception. One of the functionality of the program is the development of its main page, which is a choice of one of five thematic dictionaries (Figure 1).
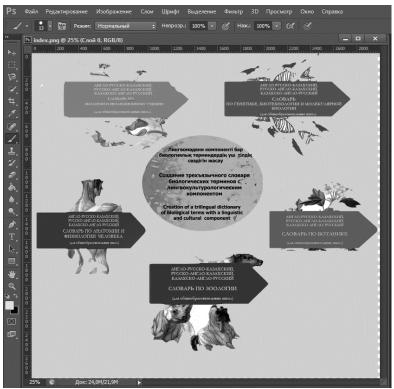
Figure 1: An Example of the Main Page of the Electronic Dictionary in
Adobe Photoshop Graphic Editor

The main page of the dictionary includes English-Russian-Kazakh, Russian-English-Kazakh and Kazakh-English-Russian dictionaries of biological terms necessary for understanding the material and conducting lessons in the English, state and Russian dictionaries. When creating the dictionary layout, the logical location of the pages of the electronic dictionary and its individual components was determined (Figure 2).
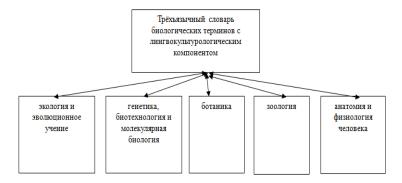
Figure 2: The Logical Alignment of Pages of the Electronic Dictionary and Its Individual Components

ecology and Evolutionism   genetics, biotechnology and Molecular biology   botany   zoology   human anatomy and physiology

After having developed the layout of the dictionary, we proceeded directly to its make-up using the Adobe Dreamweaver program. The home page screen in Adobe Dreamweaver provides quick access to initial templates, last files to be used, and the types of files. The Dreamweaver work environment enables to view documents and object properties. It also contains many of the most commonly used operations on toolbars, allowing to quickly make changes into documents. At the initial stage one creates a folder in which all working files of the compiled electronic dictionary will be stored.

Creating the main page of dictionaries according to themes involves creating its layout which contains the page setting: head,

index, main, menu. A sample layout is created similarly for each of all five dictionaries. The name of each main page will have the name titul_ (dictionary title). Further, for each dictionary, separate html pages are created: head, index, and menu, main (Figure 3).
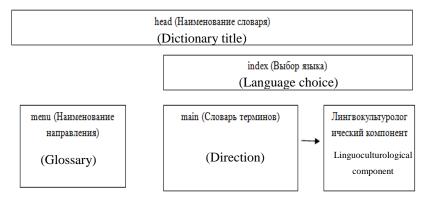
head (Наименование словаря)
(Dictionary title)

index (Выбор языка)
(Language choice)

menu (Наименование направления)	main (Словарь терминов)	Лингвокультурологический компонент
(Glossary)	(Direction)	Linguoculturological component

Figure 3. The Oder of Creation of a Dictionary Using the Adobe Dreamweaver Program

4. CONCLUSION

The compiled electronic dictionary will allow for the use of visual and convenient methods for displaying information, a variety of search criteria and grouping of material. In the future, media applications (video, photo) will be used, which, in turn, will help students build links between the studied objects. Among all the many programs for creating electronic educational resources, we have chosen not the newest but the most convenient and simplest Adobe Dreamweaver application. This program conforms fully to technical requirements for the creation of electronic publications, has great

possibilities of visualization, is easy to use it and allows for the creation of a dictionary that does not depend on the Internet access, which is extremely important in schools from remote regions of the country.

Along with the numerous advantages of the compiled dictionary, there are some disadvantages of the product. Considering the simplicity of the created structures, Dreamweaver did not allow creating a dictionary with a more pleasant visual design. All information is tabularized, the cells are filled unevenly, leaving gaps, and the design decision is limited to the choice of background, the settings of font and the style of the table borders. Compared to the modern mobile applications or the standard Windows software package, the electronic dictionary is at disadvantage of not having the elegance of solutions, because preference is given to the functional sides of the dictionary being created.

Another disadvantage is the restriction to the updating of the dictionary base, as in case of making adjustments to the database, the only way to update the content of the electronic dictionary is to completely reprint it. This difficulty, however, is completely absent in the online version of the dictionary, and one of the tasks of the research group, which is to create a stand-alone product that does not depend on Internet access, has been realized.

To date, the first disk version of the trilingual dictionary of biological terms with a linguoculturological component with certificate

of authorship has been created [56]. The dictionary on the disk is used free of charge in more than 20 educational institutions and libraries of Russia, Kazakhstan and Kyrgyzstan (Note 3).

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