The method of educational programs localization under internationalization of academic environment

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Abstract
In the context of the internationalization of education the need for localization and translation of educational programs into foreign languages with the aim of attracting foreign students is increasing. Consequently, new methods and resources are required to optimize educational process. However, currently there are not enough localized programs translated into English and localized for the new contingent of university students although localized programs are urgently needed as they give foreign students the opportunity to choose the most suitable direction for study. The purpose of the proposed research is localization as a linguistic and cultural adaptation of digital content to the requirements of the foreign market and translation into English the educational program “Software Engineering” for students of telecommunications specialties taking into account both technical and didactic terminology. To speed up the translation the glossary is compiled using online and offline services. As a result, the program “Software Engineering”, designed for foreign students, is localized, translated and adapted. Thus, a more “friendly” environment for entering the educational process in the new intercultural conditions is created. This practice becomes an integral part of the lecturers’ activities. On the other hand, students themselves can be involved in content creation and research. The design of localization should be directed from simple to complex, taking into account a certain balance between depth and composition of research. In general, the presentation of localized programs at the international level has a number of advantages for universities, including economic ones, for example, increasing the income invested in equipping the educational process.

Keywords: localization, translation, adaptation, educational program, internationalization

Introduction
The article considers the problem of localization and translation of educational programs in the context of internationalization of education which requires the presentation of programs to a wider range of future foreign applicants.
“The Routledge Encyclopedia of Translation Studies” gives the following definition of the term “localization”: “Localization can be defined as the linguistic and cultural adaptation of digital content to the requirements of the foreign market and destination as well as the provision of services and technologies for managing multilingualism in global digital information flow” (Baker, 2009, p. 157).

However, the localization and translation process has a complex structure. Thus, F. Wolfen and L. Adinolfi note that localizers involved in localizing and translating a project for an audience of other countries create terminological meanings, taking into account situational and linguistic factors that influence on the decision to localize content. At the same time, the authors indicate that this process develops certain skills and enriches the professional experience of lecturers (Wolfen & Adinolfi, 2019, p. 327).

At the same time, the problem of localization and translation tools is being solved. So, H. Adriye, A. Alkhalaf & M. Alkhlafl write that software automation is becoming increasingly important, especially in connection with the expansion of open educational platforms but has its advantages and disadvantages. Systems can cause difficulties in their use associated both with technical problems and language errors in the system or a language barrier. This fact requires the creation of new mechanisms, more “friendly” to program developers, more localized and easier to understand (Adriye, Alkhalaf & Alkhlafl, 2019, p. 215).

S. Nourabadi & M. Sobhaninejad note that the work on localizing the content of programs should take into account the following parameters: age orientation (young generation), compliance with the needs of a society, a variety of interdisciplinary programs, the possibility of updating and localization. The localization design should be directed from simple to complex, taking into account a certain balance between the breadth, depth and composition of the content development, attracting lecturers to create and update these programs. In addition, students themselves can participate in the discussion of program design, taking into account their abilities and competencies necessary for socialization in the given society (Nourabadi & Sobhaninejad, 2018, p. 285).

At the same time, it is possible to appeal to the experience of other countries. Guo & Xie point out that Chinese universities are actively entering the international market for educational services, establishing branches and implementing their programs. Accordingly, they have experience in implementing educational programs based on two principles: localization and internationalization. Introducing the features of Chinese learning and culture, they combine the advantages of the local environment with the international principles of education which contributes to their own development (Guo & Xie, 2017, p. 213).

As noted by J. Djan & G. Babu, many universities strategically offer more advanced training programs, taking into account the increasing involvement of the
virtual environment in the educational process. Moreover, the programs are offered not only for the younger generation but also for retraining specialists in order to obtain new knowledge and relevant competencies. Therefore, it is in the interests of universities to disseminate their programs abroad to all interested parties who wish to improve their competencies “without borders”. Such experience provides training flexibility, including timing and speed of training depending on the students’ employment. At the same time universities win too, as it allows them to expand their offer to those who otherwise could not use it. A computerized program that offers individual opportunities can help motivate students around the world (Djan & Babu, 2016, p. 430).

The international presentation of programs or even their sale has several advantages for universities, including economic ones, for example, an increase in income that contributes to their further development. On the other hand, programs presented at the international level give foreign students the opportunity to choose the most suitable direction for study. In addition, countries such as Australia, Canada and the United States are increasingly relying on the further employment of foreign graduates who agree to work in remote regions where the natives of these countries are reluctant to go.

The purpose of this article is to present the experience of localization and translation of the educational program “Software Engineering” for students of telecommunications specialties, taking into account both technical and didactic terminology.

The novelty of the declared topic and development is the proposal of a methodology for the localization and translation of educational programs in order to attract more foreign students by creating the most understandable “friendly” content.

1. Methods of localization and translation of the educational program “Software Engineering”

As noted above, the first step in preparing a program for international students is its localization which is understood as the linguistic and cultural adaptation of software and information technologies to the requirements of foreign students.

To attract foreign students, it is necessary to localize existing programs taking into account the specifics of a particular academic discipline. Thus, Santamarina points out the need to revise geo-engineering programs to clarify terms, providing a thorough understanding of the basics of discipline and understanding the role of engineering in an ever-changing world. The author, for example, identifies a number of terms necessary for understanding and assimilation: terms with multiple semantics, misnomers, incorrect concepts, superseded, restrictive / simplistic, fragile correlations and equations with local validity. In general, geo-
engineering continues developing as a result of the synergistic interaction of education, research and practice (Santamarina, 2015, p. 135).

Prideaux examines the medical education situation. He notes the introduction of certain terminology in this area. In particular, there is a general glossary of terms related to medical practice and education published by the International Institute of Medical Education (IIME) (Prideaux, 2019, p. 25).

One of the tasks of localizing the educational program “Software Engineering” for future foreign students is the translation of regulatory documents accompanying the educational program. To speed up the translation work, it was decided to compile a thematic glossary of pedagogy and information technology terms.

To highlight terms from regulatory documents, the first step is to analyze the density of keywords and phrases. Keyword density is a measure of the repetition rate of keywords in a text. The indicator is calculated as a percentage of the number of keywords to the total number of words in the text. It should be noted that the so-called “noise” words such as common, frequently encountered parts of speech, such as participles, particles, prepositions, interjections, numbers, etc are not taken into account.

Currently, there are many online services on the Internet for analyzing the density of frequently encountered words. Note that to work with such services, it is necessary to have documents in formats that allow copying the text (for example, DOC, PDF, TXT):

1. SeoTXT.com is a service used by the authors to compile a glossary of IT terms. The program allows setting the following parameters: how many characters in the words should be taken into account, whether numbers and “noise” words should be taken into account, how many phrases should be searched. After necessary settings, the text is copied to the window and the Analysis button is clicked. The disadvantage of this service is that it only works with passages of text not exceeding 100 Kb. After analyzing the first part of the text, writing out the desired terms, it is necessary to remove the found words using the Notepad program. Then, the edited text is analyzed again using the service and it is necessary to repeat these steps until a satisfactory result is obtained (Text Optimizer, 2019).

2. Istio.com is an online service which allows analyzing the text by inserting a fragment of up to 100 Kb into the window and clicking the Analysis button. The program produces a table with four tabs when you click the Dictionary button. The service takes into account the morphology of words. The dictionary consists of words sorted by the frequency of occurrence in the text, so the data can be used to highlight the terms for the glossary. The disadvantage of the program is that this dictionary consists of only one-component terms,
respectively, the terms of two or more words cannot be found (SEO text analysis online, 2007-2019).

3. Advego.com works with fragments up to 100 Kb. Upon verification, there appeared a table called “Semantic Core” which indicates the number and frequency of repetitions of words and phrases, as well as the table “Words” containing only words. Accordingly, the service finds both single-component and multi-component terms. During the analysis of both tables, it is possible to determine the most common terms (Semantic analysis of text online, seo-analysis of text, 2019).

As mentioned above, the disadvantages of all services are that the large text needs to be broken down into 100 Kb passages (100,000 characters) and then each passage should be analyzed.

The translation process is impossible without the use of dictionaries. At present, the digital space offers the translator to use electronic dictionaries. Internally, such dictionaries are arranged as databases with dictionary entries. There are two types of electronic dictionaries: off-line and on-line. Off-line dictionaries can be installed on a computer or other digital device and are available for use even without access to the Internet. On-line dictionaries are available only through the Internet.

Electronic dictionaries have several advantages over traditional printed dictionaries:
- contain not only text and graphic images but also video clips, audio recordings and more;
- provide more flexibility due to the ability to carry out different types of searches;
- save time significantly;
- provide speed of search in comparison with the printed version;
- memorization function and hypertext allow the user to quickly return to the previously requested data (Chumarina, 2009, p. 265).

Among the most popular off-line English dictionaries, we note:
1. ABBYY Lingvo, available for mobile and desktop devices, has a clear interface. All available dictionaries can be used as a single. A combined list of keywords allows simultaneously accessing all dictionaries. If a word is found in many dictionaries, all relevant entries are displayed in one window.
2. Polyglossum are formed from a single source with paper dictionaries published in various industries which are equipped with a developed data indexing system that allows full-text searching in any direction. It is supported by most mobile and desktop devices.
The context has a large set of general and special dictionaries including dictionaries of difficulties of the English language, oil and gas industry, abbreviations for information technology, telecommunications and communications, music and computer processing of sound and others. It is possible to conveniently create custom dictionaries, i.e. users can create their own dictionaries by choosing the necessary terms.

The following online dictionaries are very popular among translators:

1. ABBYY Lingvo Live contains a huge database of words where you can find a translation of almost any word in several versions depending on the dictionary used.

2. Multitran is a bilingual online dictionary that contains many different meanings of a word in various topics explaining the nuances of meanings. It is possible to get examples of using phrases in the right context. Multitran is also replenished by users.

3. Cambridge Dictionaries gives for each word both transcription and audio in two versions – American and British. Audio recordings are flawless in quality. Interpretations of words are given in English.

Contextual translator programs can be singled out as a separate category of translator assistants which allow translating a text:

1. TranslateIt! can translate not only individual words and phrases but also texts as a whole. This feature works using Google Translation. It is worth noting the possibility of using additional dictionaries, automatic language detection and ability to work with PDF documents.

2. QTranslate, a free contextual translator for Windows, uses various online services such as Google, Microsoft, Promt, Yandex and others. To translate a word, one can just select it on the screen and press the key combination Ctrl + Q.

3. Google Translate Client is a free translator for Windows, which allows quickly translating a text in most applications such as Web browsers, Office applications, messengers and so on using the Google Translate service.

Currently, translation automation tools (CAT-Tools) are widely used. The abbreviation CAT itself stands for Computer-Aided (Assisted) Translation which can be considered as “automated translation.” In the course of automated translation, the software helps the translator to make the process more efficient on the basis of translations of similar texts previously received from the user which is in no way connected with machine translation when the program translates. Externally, the CAT program is similar to a regular text editor.

Depending on the developer, translation automation tools have different functionality. Among the tasks solved by the program, the following can be distinguished:
1. The translator can create and replenish the Translation Memory database using pairs of parallel texts, i.e. the source language and the target language.

2. Due to special tags, it is possible to keep the original layout of the document. This function is convenient for texts with a multi-level structure.

3. CAT programs contain linguistic resources in the form of glossaries consisting of abbreviations, terms, special concepts used in any field.

CAT programs can be installed on one computer or have Cloud architecture. The first option supports the stationary version. In the second version, one project may be available to several translators at the same time.

One of the advantages of translation automation systems is that it is easier for a translator to achieve uniformity of a document due to the fact that the program offers one translation option if one and the same term or phrase is used. Another advantage is the ease of adjusting the finished texts. Finally, the use of CAT programs increases the speed of the translation. The system can offer translation for a significant part of the document if the translation database is accumulated or there is a glossary on a given topic (CAT-tools or Cat-programs are reliable translator assistants, 2019).

An essential element of the translator’s work is the verification and adjustment of the translated text. Obviously, no program detects one hundred percent of errors, but, nevertheless, applications for checking English grammar can become an important part of the translator’s work:

1. Microsoft Word has grammar and spelling tools. The program emphasizes misspelled words with a red line and syntax violations with a green line. When you right-click, possible corrections are opened. In the program settings there is an option to select the dialect of the English language.

2. Virtual Writing Tutor is an online tool. It provides the ability to check the text of three thousand words after free registration. In addition to checking the text for spelling and grammar errors, one can check the choice of vocabulary for context (for example, academic) (Virtual Writing Tutor, 2019).

3. PaperRater is an online service which verifies the grammatical correctness of texts and for plagiarism. It includes various modules that represent text analysis and comparison with other users (Paper Rater, 2019).

Thus, in the arsenal of translators and lecturers involved in the localization of educational programs, there are various on-line and off-line programs and dictionaries which can greatly facilitate the fulfillment of tasks.

An indisputable fact is that new methods and resources are required to optimize students’ knowledge and the educational process as a whole. One of the key competencies is the students’ autonomy combined with the ability to learn. The involvement of students in active work is an important factor in order to feel
a greater immersion in the content of the program and, thus, in the educational process as a whole. Therefore, in the process of activity, the ability to learn is activated and one’s own professional experience is acquired.

Carabias-Orti, Kroher & Moreno give an example of students’ working with a 3D audio program that allows interacting with various algorithms, localization technologies and subjective perceptions. The methodology involves the active participation of students: they must repeat the material and then activate it in the process of interaction with the simulator. The material and simulator are available online which contributes to the autonomy of learning. The results of the research show that with this orientation of training, students better understand technologies and related problems (Carabias-Orti, Kroher & Moreno, 2015, p. 3371).

Therefore, the involvement of students in the creation of content helps to activate the knowledge already gained and put it into practice.

2. Results on the localization of the educational program “Software Engineering”

In the process of localization and translation into English the educational program “Software Engineering” for students of telecommunications specialties an analysis of the density of texts in the specialty is carried out. The analysis is carried out using SeoTxt.com software, as the program contains a setting for the number of words contained in the phrases to be found. Thus, it is possible to search for multi-component terms of 2, 3, 4 words.

After searching phrases in texts with different parameters, there formed a list of the 50 most frequent terms from the field of higher education for special attention while translating, supplemented by terms from the title pages of curricula.

Next, a list of IT terms is compiled that are most often found in work programs, educational complexes and manuals. For this, an analysis of the content of work programs of all disciplines and texts available in electronic form of teaching aids using the above service is also performed. According to the results of the work, the list of the most frequent terms is obtained from the following sections of informatics and information technology: programming languages, object-oriented programming, computer and network architecture, computer graphics, operating systems, databases, software engineering, system modeling. It has been supplemented by a list of didactic terms.

After compiling the list of terms in the field of information technology and didactics, they are translated and a glossary is compiled. During the translation, on-line and off-line dictionaries are repeatedly used, including those mentioned above.
Thus, on the basis of the compiled thematic glossary after translating the documentation for the localized educational program, the following are obtained:
1. General Characteristics of the Educational Program “Software Engineering”;
2. Matrix of competences;
3. Scheme of educational program paths;
4. Curriculum;
5. Module abstracts;
6. Module syllabi;
7. Course syllabi.

**Conclusion**

Thus, after analyzing the theoretical provisions of the topic under discussion, we have come to the conclusion that in the context of the internationalization of the educational environment, it is of great importance to solve the problems of localization and translation of existing native language educational materials and programs.

The aim of our research is the localization and translation into English the educational program "Software Engineering" for students of telecommunications specialties, including technical and didactic terminology. Taking into account the world experience described above, which indicates that for localization special terminological fields are allocated and glossaries are created, we also decided to compile a thematic glossary of terms in the field of IT technologies and didactics based on the analysis of regulatory documents.

After analyzing the available computer services, we choose the SeoTxC.com service as the optimal one for searching multi-component terms. Further, on-line and off-line dictionaries are used to translate the obtained sample. Currently, there are a number of on-line and off-line programs and dictionaries that can provide significant support to both lecturers and translators.

Thus, the following results are obtained: general characteristics of the educational program “Software Engineering”, a map of competencies, an outline of educational paths, curriculum, annotations and work programs of modules, work programs of disciplines. The program is currently being prepared for testing.

Taking into account the complexity and multi-levelness of the localization process, the solution of problems should be carried out at an interdisciplinary level, uniting both linguists-translators, specialists in the field of education and specialized subjects, as well as students who are developing their professional competencies already at the training stage, which could help to create more “friendly” content to attract international students.
References


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