

PEDAGOGY AND EDUCATION

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Immersive technologies and the practice of foreign language teaching for students of computer science specialities

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Abstract.

The problem of digital transformation, which arose as a result of global processes of forming a new type of society, is an integral part of professional development at the current stage of human development. This bright trend is also reflected in education, especially during the training of IT students, where old methods of work are no longer relevant, because they do not take into account the needs of today. The traditional didactic paradigm does not form an individual educational trajectory and does not develop the skills of international interaction of future specialists in the labor market. Using the example of an educational program for students of computer specialities, the article proves the effectiveness of digital bilingual education, which differs from traditional forms because its methodological schemes involve the use of a foreign language not only as a tool of the humanitarian cycle, but also as a means by which speciality subjects are taught. In order to develop immersion, that is, a type of digital bilingual education where a large number of subjects are studied in a foreign language, it is necessary to perform a complex task that requires colossal training at various levels – a sufficient informational and material university base and a powerful scientific and methodological potential among professors and teachers staff. Learning conditions within bilingual programs are implemented mainly in English and require correct planning from the administration, and new forms of preparation for classes from the lecturers. In the educational environment, the use of augmented and virtual reality technologies begins – in order to visualize the educational material, supplement it with visual information materials by reading QR code with smartphones, tablets and other gadgets, increase motivation and interest in learning. An important role is played by the ability to work in tandem (a practice widely used by European educational institutions), as well as the ability to self-educate. It is necessary not only the cooperation of teachers of language disciplines with specialized departments and guarantors of specialities, but also access to the resources of other countries, the creation of a special environment that will promote high-quality teaching, learning and use of the English language.

PEDAGOGY AND EDUCATION

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augmented and virtual reality technologies

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PEDAGOGY AND EDUCATION

Modern bilateral European integration processes, which were significantly accelerated during the war period, contribute to the reform of Ukrainian society according to European standards at various levels of its functioning. As noted in the analytical report "Integration of Ukraine into the European Union's Digital Single Market: challenges, opportunities and barriers", currently on the agenda "the total digitization of management and information exchange processes is planned", an "analysis of current national legislation in the field of electronic communications, electronic commerce, radio frequency resource and electronic identification" [1].

The result of these processes was an urgent need for highly qualified professionals who are able to support advanced ICT research and innovation, use modern digital infrastructures, create regional and sectoral open innovation ecosystems based on ICT solutions and online platforms, using the necessary language skills. In view of this, the dependence of the professional training of IT students on the adequate methodology of learning foreign languages, the formation of its more functional cognitive stage, where the implementation of the practical part is based on the concept of a dual purpose, according to which a foreign language is a tool for studying specialized disciplines, is of crucial importance.

Under these circumstances, the main objective and tasks of linguistic didactics is the selection of effective learning technologies, not only for foreign languages, but also for adaptation courses that contribute to the development of intercultural foreign language communicative competence (sensitivity) and the achievement of a synergistic component during continuous education. The relevance is also caused by the need for in-depth learning of the pan-European initiative "Euro HPC Joint Undertaking" in the original language.

The formation of methodology of a new type is impossible without the concept of subject-oriented bilingualism of an active, productive intellectual type, where learning takes place not through the creation of an artificial atmosphere, but with the participation of direct media, authentic written documents, and oral speech scripts of a digital nature.

The problem of bilingual education and immersion is the object of research in the works of many national scientists.

PEDAGOGY AND EDUCATION

In particular, its theoretical foundations are highlighted by Anatoliy Shtifurak, who analyzes the unique conditions of education in bilingual countries [2], and Stanislav Ivanenko, whose articles talk about "the synthesis of certain competencies, which ensures a high level of foreign language proficiency and a deep mastery of subject content" [3]. Maria Vinarchyk [4] writes about dual education in the context of the "European dimension", the importance of using innovative techniques and strategies. Christine Helot and Marisa Cavalli, their foreign colleagues from the University of Strasbourg, focus their attention on the problem of determining the dominant language in CLIL (content and language integrated learning) models [5].

In foreign literature, the concept of "immersive teaching" (immersive learning, immersive education) describes the study and consolidation of the potential within so-called "virtual worlds" in the educational environment [6]. Over the past few years, "virtuality" in education area has been recognized as a powerful and effective tool to support learning.

Despite the considerable number of publications, the problem of the introduction of immersion education in Ukrainian higher education institutions requires a practical solution with specific models and mechanisms for its implementation.

The purpose of the article is to study the concept and functions of immersion education, its didactic models (including the use of the tandem method), created in the conditions of European integration for the training of future computer network support specialists in Ukrainian universities.

Based on the general laws of human communicative activity, it can be said that language means are isomorphic in nature, the same mechanisms are laid in their deep foundation. And the only problem is to find the code that makes switching from one language to another easy and effortless. However, this very mechanism is the cornerstone in the formation of bilingual skills, the process of mastering the speech means of another cultural or professional community.

Modern social and economic processes that occur in the world demand from an individual not only the mastery of

PEDAGOGY AND EDUCATION

communication skills in a foreign language, but also professional foreign language (in particular, terminological) knowledge of the chosen speciality. Bilingual education is a complex and multifaceted phenomenon that includes dozens of concepts and is correlated with professional practice. In Ukrainian higher education institutions, it involves learning the program material in two languages – Ukrainian and one of the languages of the European Union (usually English, French or German). At the same time, the curriculum is divided into three stages: study of subjects in Ukrainian, presentation of material in a foreign language (from grammar correction course and visual and auditory perception of authentic texts to dialogical speech and business games), acquisition of professional knowledge in both languages in parallel (working with professional documentation, solving specific professional tasks).

It can be said that in the system of professional education, bilingualism can be implemented in different variations:

1) mastering one part of the curriculum in Ukrainian and the other in a foreign language, and the language is chosen by the student from the options offered by the university and its language department. In 90% of cases, bilingual programs are taught in English. It is appropriate to use such a didactic model, provided that the student first acquires the basic knowledge and skills of translating information by means of a foreign language;

2) parallel teaching of a foreign language for the needs of mastering a separate part of the educational program. In the case of learning a foreign language, it is a priority, and for understanding additional scientific or theoretical aspects, the foreign language is an auxiliary tool. Within this model, the student studies highly specialized topics from professional subjects in a foreign language as individual homework or group projects;

3) gradual implementation of part of the curriculum in a foreign language in senior years, as skills sufficient for professional foreign language communication are acquired.

Bilingual education involves the creation of special conditions where a foreign language is not just a subject of

PEDAGOGY AND EDUCATION

study and improvement, but a tool for acquiring new knowledge. The foreign-language part of professional primary sources teaches European standards and a combination of experience from different countries. It enriches the classical educational program.

Currently, two main scenarios for the introduction of bilingual education in Ukrainian universities can be distinguished. These are directions with the initial study of a foreign language and the subsequent transition to mastering a part of the curriculum with its help (when students start learning the educational program in several languages from the first years) and the development of bilingualism with the help of academic mobility programs or an international foreign internship provided by the curriculum.

Of course, the process of learning a foreign language is not simple, and student-centered learning is related to cognitive strategies and individual characteristics of students, their level of development of thinking skills, goals and motivation, confidence or insecurity in their own abilities, experience, etc.

It is also appropriate to ask about the ratio of the main components of such a course – starting from the text material and ending with language and speech exercises, the implementation of different level scenarios of professionally oriented education in accordance with the needs and capabilities of bachelors and their level of general training.

In order to master the digital bilingual program, the applicant needs to seriously prepare and adjust correctly, and be motivated. First, the admission selection strategy for such a profile will require mandatory knowledge of a European language or command of it at a level sufficient for understanding and communication. For this, language intensives for gifted youth are needed, because competitive selection for popular specialties is quite tough.

At the same time, it is important that the institution of higher education has a sufficiently prepared teaching staff, material and technical base, and information resources.

In order for this process to be successful, first of all, special pedagogical technologies are needed. One of them is an integrated subject-language approach called English for

PEDAGOGY AND EDUCATION

professional purposes. It combines two trajectories – subject content and professional foreign language. In other words, it is language learning through situations of a professional nature, where classes are conducted by a foreign language teacher, and the context of the specialty has the character of general professional concepts.

For the training of bachelors in IT specialities, the mentioned approach can be implemented by using a number of educational and professional programs in specializations designed for the in-depth possibility of operating digital programs of the European Union countries in the original language and the ability to use language skills and knowledge during the implementation of digital transformation, when attention is fixed at the content level on advanced ICT research and innovation in English-speaking countries.

Modern trends in the development of English as a language of professional communication and its formation in the Ukrainian educational environment are developing very actively not only as a result of a purely pedagogical understanding of the importance of building educational routes (so-called "road maps"), but also through objective realities that affect the specifics of existence knowledge as the "end product" of information assimilation.

Internet resources are mandatory for use, they change traditional approaches to alternative ones and in recent years have become one of the key factors in the development of higher education. The field of bilingual teaching in Ukrainian universities, enriched with computer technologies, has turned into an environment where distance learning is no less effective than offline classes.

The primary advantage of this form of education is its practical component, continuity under almost any circumstances, and exceptional individualization.

The main thing is that the resources to be studied are related to the future profession of the student of higher education. Specialists need to understand and know the main terms, it is also important to be able to build a dialogue with foreign partners, that is, to form foreign language competence in those who study.

Such initiatives provide for the formation of higher

PEDAGOGY AND EDUCATION

education graduates as experts in the field of digitalization with advanced knowledge of a foreign language, which can be used in professional activities: acquisition of general and professional competencies necessary for practice, including when interacting with foreign partners; entry into the international social and professional system; formation of skills and practical skills that ensure active participation with the use of a foreign language; an expanded list of selective educational components by academic disciplines that form universal non-professional qualities.

Virtual reality technology in foreign language learning can be effectively applied to solving private methodical tasks, such as practicing elementary dialogues, memorizing vocabulary, language conversational practice, etc. building and should be embedded in a wider methodological system.

In the context of communicative situations and language practice, virtual reality intersects with artificial intelligence and speech recognition technologies.

Despite the fact that access to virtual reality technologies is not yet widespread, in the future we can cautiously predict a new round in the development of the online course industry. VR, effectively integrated into the structure of the online course, provides more opportunities for practical practice of the studied materials. Perhaps such a vector of development will bring online language courses to a qualitatively new level.

The question of the effectiveness of remote autonomous methods of teaching foreign languages still remains open [7], [8], but a virtual reality tool, properly integrated into the system of an online language course, can serve as a serious help to those students who want to learn languages independently online.

One of the most productive means of forming digital professional competence of an international standard is the organization of training in a bilingual environment using the tandem method. The tandem method is a method of learning a foreign language by two partners with different mother tongues who work as a pair. The main goal of the tandem is to master the language of one's partner in a situation of real and/or virtual communication, to get to know his personality, the

PEDAGOGY AND EDUCATION

culture of the country of the language being studied, as well as to obtain information in various areas and fields of knowledge that are equally interesting to the tandem partners.

Based on this, it is possible to outline two main vectors of tandem education – language and subject. They act as a compensatory mechanism in relation to each other. Ideally, the ratio of subject and language components should correspond to a 50:50 ratio, but it always changes according to the level of complexity and the purpose of studying a particular topic.

Selection of the language content of the discipline, relevant to global labor markets, is an important task. The first and main contradiction, which is seen by the teachers here, is the inconsistency of the competences of the foreign language teacher with the specialized disciplines. Of course, many domestic teachers have a second education and are masters, for example, in economics. However, professional education is much more complicated and the training of specialists of a certain profile covers a huge number of directions. And simply replacing a foreign language teacher with a subject teacher who has a B2 level in English can lead to a significant loss of the quality of language teaching, because the subject does not have the methodological tools and necessary philological competencies for language education, and does not have special training. And therefore, a balance is needed – cooperation of philologists with specialized departments, with guarantors of specialties. And this is the first vector of tandem cooperation. It is bilateral, because in the countries of the world there is a practice of EMI – teaching professional disciplines in English (English as Medium of Instruction). The main idea of such a tandem is the cooperation of teachers – a subject specialist and a linguist – in the implementation of a single educational course. Responsibilities will be distributed according to the competences of the teachers, where linguists are responsible for the language component, and subject specialists are responsible for the formation of subject knowledge and skills.

The second component of educational tandems from the point of view of the language component is the improvement of means of communication, access to the resources of other countries, the creation of a special environment that will promote high-

PEDAGOGY AND EDUCATION

quality teaching, learning and use of English and other foreign languages.

It can be a meeting with foreign lecturers, various forms of listening, professional discussion. Writing scientific articles, term papers and theses in a foreign language (with an emphasis on foreign primary sources in comparison with domestic approaches and developments) will contribute to the development of the scientific apparatus and bilingual thinking.

This especially applies to academically capable youth who, due to geopolitical (military actions), epidemiological or other reasons, did not have the opportunity to acquire language education at the appropriate level. In this case, a student exchange between the two countries, as well as joint research activities, can become a model of tandem interaction. Students should gain access to various forms of external training courses, participate in international scientific conferences and webinars, as well as in international educational projects implemented by European youth research centers.

The process of integration into European society, assimilation of general cultural traditions and progressive professional norms of the European Union, development of motivation for professional interaction with foreign partners determined the choice of educational trajectory of Ukrainian universities in the field of interdisciplinary relations for training students of information and computer specialties. The most effective didactic model, which provides for the formation of international interaction skills of future specialists in the labor market, turned out to be bilingual education using immersion technologies.

Existing tools for learning foreign languages in virtual reality are a collection of disparate developments of varying degrees of quality and completeness. Unlike the market for English language textbooks, where there are leaders and canons developed during numerous studies, there are no such leaders in the field of virtual reality. So far, we can talk about three main directions of using VR technology for learning foreign languages. This is virtual reality as an autonomous tool for training one or another linguistic skill or skills,

PEDAGOGY AND EDUCATION

a component of a comprehensive program, an educational environment, an alternative to a physical learning space. The use of such technologies expands professional horizons and provides opportunities to work with primary sources, as well as establish business contacts within the country and beyond.

Preparation for communication in a foreign language, important for future professional activity, can be carried out on the basis of special educational and professional programs capable of creating conditions for personal development, academic mobility and international recognition by rebuilding in-depth cognitive and practical abilities and skills, improving professional skills and creative innovativeness at the level necessary for solving complex specialized tasks and practical problems in the field of professional activity.

The Ukrainian education system, which currently strives for harmonious and equal coexistence with other educational systems of the world market, is able to ensure the quality of training of students of IT specialties in accordance with international standards, using the tandem method. Cooperation at the level of the student and his mentor, multidisciplinary teaching staff and international partnership gives education the characteristics of multimodality, and permanent communication with native speakers eliminates psychological language barriers. Tandem is a unique space where a mutual exchange of ideas takes place in the process of communication. Thanks to the synchronization of motives, language and subject vectors of tandem learning lay the foundation for long-term and productive professional relationships with a high level of trust.

The development of bilingual foreign language communicative competence, which occurs as a result of the synthesis of communicative and professional components, opens limitless horizons of academic interaction.

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PEDAGOGY AND EDUCATION

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