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## **Information technologies as a means of overcoming social-cultural barriers in the process of international students training**

**Las tecnologías de la información como medio de superación de barreras socioculturales en el proceso de formación de estudiantes internacionales**

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### **Abstract**

The intensification of the development of digital technologies and their introduction into educational activities has necessitated the use of digital technologies in the educational process of higher educational institutions in order to overcome language barriers in the provision of educational services to foreign students. The purpose of the research lies in identifying the main problematic aspects and prospects for the application of digitalization as a means of overcoming language barriers in the education of foreign students. The methodological base of the academic paper consists of the following methods of scientific

research, namely: the method of theoretical analysis and synthesis, analysis and scientific abstraction, comparison and analogy, grouping and cluster analysis based on the k-means method, generalization and systematization. The results of the conducted research have made it possible to establish that overcoming language barriers in the education of foreign students significantly depends on the level of digitalization of the society and the system of higher education. Intensification of the use of digitalization as a means of overcoming language barriers in teaching foreign students will make it possible to minimize the level of language barriers and ensure the improvement of the quality of the educational process in the online environment through applying digital technologies, as well as create favourable conditions for conducting a simple and understandable language for foreign students.

**Key words:** higher education seekers, digital technologies, educational activity, language barriers, educational process, digitalization of education.

## Resumen

La intensificación del desarrollo de las tecnologías digitales y su introducción en las actividades educativas ha hecho necesario el uso de tecnologías digitales en el proceso educativo de las instituciones de educación superior para superar las barreras del idioma en la prestación de servicios educativos a estudiantes extranjeros. El propósito de la investigación radica en identificar los principales aspectos problemáticos y perspectivas para la aplicación de la digitalización como medio para superar las barreras del idioma en la educación de estudiantes extranjeros. La base metodológica del trabajo académico consta de los siguientes métodos de investigación científica, a saber: el método de análisis teórico y síntesis, análisis y abstracción científica, comparación y analogía, agrupación y análisis de conglomerados basados en el método k-means, generalización y sistematización. Los resultados de la investigación realizada han permitido establecer que la superación de las barreras del idioma en la educación de estudiantes extranjeros depende significativamente del nivel de digitalización de la sociedad y del sistema de educación superior. La intensificación del uso de la digitalización como medio para superar las barreras del idioma en la enseñanza de estudiantes extranjeros permitirá minimizar el nivel de las barreras del idioma y garantizar la mejora de la calidad del proceso educativo en el entorno en línea mediante la aplicación de tecnologías digitales, así como como crear condiciones favorables para la realización de un lenguaje sencillo y comprensible para los estudiantes extranjeros.

**Palabras clave:** buscadores de educación superior, tecnologías digitales, actividad educativa, barreras idiomáticas, proceso educativo, digitalización de la educación.

## 1. Introduction

New challenges and dangers caused by destabilizing factors of the world economic order, globalization, geopoliticization and regionalization have led to the need to intensify the development of digital technologies in education, forasmuch as ensuring an

uninterruptable, high-quality and effective educational process in modern conditions is impossible without the use of distance learning methods.

The problems related to spreading the COVID-19 pandemic have initiated the intensification of the process of transition to other innovative forms of education, in which digitization plays a significant role, given that ensuring the safety of higher education seekers becomes possible only in the conditions of distance learning. It is obvious that the transfer of students to the territory of other countries in order to obtain professional training in the chosen speciality creates obstacles in the field of establishing dialogue, and language barriers do not contribute to free verbal expression, which is especially acute in the process of training students from other countries, where digital technologies are not sufficiently developed, and maintenance and modernization of digital equipment is rather expensive.

As a result, foreign students face problems of fear of public speaking, internal expectations of external criticism and fear of making mistakes and inability to express their own opinion, which indicates the presence of language barriers and the need to search for effective means of overcoming them. As evidenced by the results of existing scientific investigations in this sphere, digitalization technologies are capable of reducing the tension of the situation, creating comfortable conditions for foreign students and overcoming language barriers in their studies, which actualizes the research topic.

## **2. Literature Review**

The integration of countries into the global educational space determines the accessibility of foreign students to the educational process in any country and stimulates higher education institutions to provide services to foreign students. Under such conditions, the need arises to establish a dialogue and build effective communication, in which important significance is attached to language training and ensuring the ability of students to use language skills in practice. It is obvious that the majority of foreign students experience certain difficulties in communication, which in the scientific discourse are called language barriers; that is, obstacles reducing the effectiveness of educational activities, making significant changes in personality development and leading to the emergence of interpersonal conflicts. Karasu (2014) associates language barriers with the appearance of psychological obstacles that arise in the process of receiving and transmitting information in the environment of interpersonal interaction, leading to the blocking of effective communication in the process of educational activities and causing insufficient motivation of students, decreasing their self-esteem. The scientist highlights the following most common language barriers in the education of foreign students, namely: the difficulties of perceiving a foreign language, problems in communication due to shyness, insecurity and the inability to express one's opinion, as well as contradictions in the culture of speech and the features of linguistic experience.

Samantaray (2020) emphasizes that, in addition to the mentioned above, from among the most significant language barriers, poor Internet connection in rural areas should be paid particular attention to; accordingly, students living in rural areas are unable to fully use the opportunities of digitalization of the educational process. The insufficient level of training of the teaching staff to implement the educational process in an online environment through using digital technologies is equally important. In addition, the development of digital education is still not able to normalize language barriers, forasmuch as different languages for communication do not contribute to the effective and rapid promotion of digital content, which is mainly formed using the English language, and students who do not speak it are limited in access to the use of available information.

A similar viewpoint is held by Ke & Balungile (2017), who believe that overcoming language barriers in education depends on the factors of the external and internal environment and on the social status of the students.

At the same time, Akhmetova et al., (2020) have studied the theoretical aspects and problems of overcoming language barriers, as a result of which they have singled out the main factors influencing the formation of language barriers and proposed methods and ways of overcoming them. Herewith, the scientists have considered various viewpoints on this scientific category and found out that language barriers are a kind of difficulties in producing speech, which are manifested in the individual subjective inability to use existing knowledge in the process of expressing thoughts.

Morgunova & Prikhodko (2020) associate overcoming language barriers with providing comfortable conditions for students, which contribute to the transfer of knowledge to learners in an understandable, accessible, simple and interesting way. Along with this, the scholars substantiate the feasibility of using such a method of removing language barriers as edutainment and emphasize the importance of using digital technologies when developing methods for overcoming language barriers.

Ryndak & Saldaeva (2021) consider the digitalization of education as one of the effective tools of the educational process, and the introduction of digital technologies as a method of acquiring skills and competencies by students in the process of implementing operational changes in the society, which contribute to increasing the level of access to education and reducing certain barriers. However, certain features of the digitalization of education are noted by the scientists, which are related to the need to solve the problem of improving the digital literacy of students. In this context, Schmidt & Tang (2020) are convinced that digitization is a strategic initiative towards improving the quality of teaching educational material to foreign students and an element of innovative development of the educational environment. At the same time, the scholars claim that the integration of digital technologies into the educational process is not a qualitatively new process in the educational environment, but the pace of technological progress in relation to them has intensified tremendously, which is manifested in the constant improvement of forms of digital technologies in the educational activities of higher educational establishments.

Falling in the opinion of previous researchers, Lütge et al., (2019) prove that digitalization produces new means, methods and forms of learning that differ from traditional ones in their multimodality and interactivity, and the formation of language barriers in the education of foreign students is considered one of the challenges of foreign language training, causing the deconstruction of the boundaries between traditional and digital education.

Ainslee (2018) considers digitalization as a means of overcoming language barriers in the education of foreign students from the point of view of modern requirements, as a response to the radical development of the digitization system of all spheres of the society in a global dimension. In this context, Nesterchuk et al., (2020) claim that the digitalization of education depends significantly on the level of development of the country; the problem of its increasing in the conditions of the COVID-19 pandemic has become especially relevant due to the transition to a distance form of education. At the same time, scientists single out a number of problematic issues that hinder the development of digitalization of the educational process, in particular, with regard to overcoming language barriers in the education of foreign students, namely: (1) insufficient development of digital technologies in the field of education; (2) lack of the relevant software; (3) unprofessionalism and insufficient level of knowledge of teachers and their inability to apply innovative digital technologies in the educational process; (4) unpreparedness of students and the impossibility of them gaining access to learning using digital technologies. As a rule, establishing communication between teachers and students is carried out by using popular educational sites or e-mail.

Savchenko (2018) has established a positive effect of using illustrative materials by teachers in the training educational disciplines, which are formed using digital technologies and activate the process of involving students in the educational process, and Gratis (2022) suggests several ways to overcome language barriers in teaching international students, including as follows: (1) using plain language; (2) searching for a reliable translation service and using the services of a translator; (3) conducting additional classes on language learning; (4) use of visual methods of communication; (5) resorting to frequent repetitions; (6) respectful attitude towards interlocutors. At the same time, the scientist notes that overcoming language barriers is a difficult task in the higher education system and requires the formation and use of innovative approaches to its solution, which can certainly be achieved thanks to the development and application of digital technologies, and Jureddi & Brahmaiah (2016) associate the achievement of a positive effect in this process with the timely identification of language barriers and the provision of proper conditions for their management.

Mao (2022) is convinced that the digitalization of education has a significant impact on overcoming language barriers in teaching foreign students, forasmuch as it contributes to the constant increase in the amount of data and information available to higher education seeks; the scholar has established that in highly developed countries, language barriers are less tangible, and their overcoming is characterized by the harmonious interaction of

students and teachers towards balancing the psychological climate in the study group and the formation of a perfect vocabulary.

### **3. The Research Goals**

The purpose of the research lies in identifying the main problematic aspects and prospects for the application of digitalization as a means of overcoming language barriers in the education of foreign students.

### **4. Materials and Methods**

In the academic paper, the identification of the main problematic aspects of the using digitalization as a means of overcoming language barriers in the education of foreign students has been carried out using the method of theoretical analysis and synthesis; elucidation of the essence of the scientific categories “language barriers” and “digitalization” has been conducted on the basis of the method of analysis and scientific abstraction; methods of comparison and analogy have been used for empirical assessment of the digitization level of the European Union’s states; the grouping of the countries of the European Union according to the indicator of the multidimensional index of digitization has been carried out using cluster analysis technologies based on the k-means method; generalization of the results of the conducted research, formation of conclusions and formulation of assumptions and hypotheses has been conducted using the method of generalization and systematization; the visual display of the effective indicators of the research has been carried out using graphical and tabular methods.

The countries of the European Union have been selected for the research.

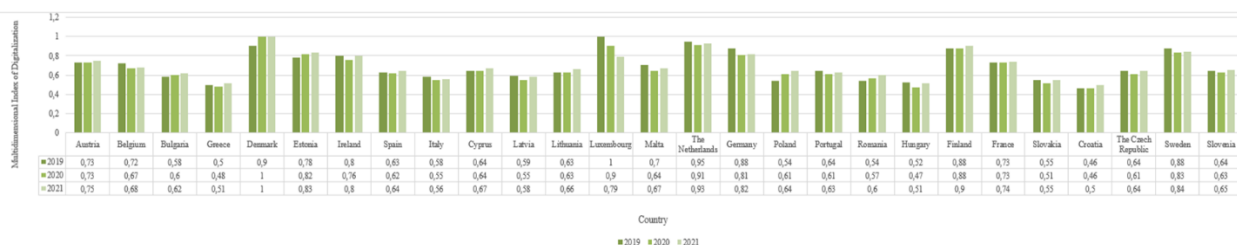
The information base of the study is represented by reports for 2019-2021 DiGiX Update: A Multidimensional Index of Digitization, in which data on the multidimensional index of digitization are systematized.

### **5. Results**

The issue of investigating digitalization as a means of overcoming language barriers in teaching foreign students has been in the centre of attention of the scientific community and practitioners for a long period of time, and its relevance is explained by the development of modern forms and methods of education, students’ access to obtaining education in other countries and the formation of a single global educational space. Undoubtedly, nowadays’ challenges and structural deformations necessitate the transition to other forms of education, the successful implementation of which is impossible without the use of innovative digital technologies. However, it should be noted that the digitalization of education, although it is developing at an accelerated pace, however, has a number of problematic aspects related to the different levels of access of education seekers to the Internet, the different possibilities of providing them with

technical means and different conditions for the digitization of social processes and phenomena.

At the international level, a methodology for assessing the state of digitization in the countries of the world has been developed and implemented, which is based on the comparison of the digitization degree of various spheres, including education, and involves the calculation of a multidimensional index of digitization. At the same time, the interrelationship between this indicator and the level of the country's development is determined; in particular, in highly developed countries, the multidimensional index of digitization is significantly higher, and, accordingly, the degree of access of foreign students to the educational process using digital technologies is more significant. The study of the main trends in the multidimensional index of digitization in the countries of the European Union in 2019-2021 (Figure 1) has made it possible to identify the highest values of the indicator in question in countries as follows: Denmark (MID: 0,9–1,0), Luxembourg (MID: 0,8–1,0), the Netherlands (MID: 0,9 – 1,0), Finland (MID: 0,9), Germany (MID: 0,8–0,9), Sweden (MID: 0,8–0,9) and Ireland (MID: 0,8); these countries are considered to be highly developed states with sustainable development, the quality of the providing educational services by higher educational institutions of which is characterized by high indicators and in compliance with European standards.



**Figure 1.** Dynamics of the multidimensional index of digitization in the countries of the European Union in 2019–2021.

Compiled based on: Noelia Camara (2020a, b; 2022). *DiGiX Update: A Multidimensional Index of Digitalization, 2019–2021*.

At the same time, significantly lower values of the multidimensional index of digitization are noted in countries that have undergone the process of transformational restructuring and have been reoriented to the European vector of development, in particular, as follows: Croatia (MID: 0,5), Latvia (MID: 0,6), Lithuania (MID: 0,6–0,7), Romania (MID: 0,5–0,6), Hungary (MID: 0,5), Slovakia (MID: 0,5–0,6), the Czech Republic (MID: 0,6) and Slovenia (MID: 0,6–0,7), where significant problems with ensuring the quality of education and creating proper conditions for providing educational services to foreign students are observed, in particular, with regard to language training of higher education seekers. The reformatting of educational activities from the post-socialist system to the European one requires significant efforts and coordination of the norms of the national education system with international ones. In addition, it is necessary to note the rather low value of the multidimensional index of digitization in Poland (MID: 0,5–0,6), Portugal (MID: 0,6) and Italy (MID: 0,6), where a significant number of foreign students acquire their education.



Taking into account the ambiguity regarding the development of the education system in the countries of the European Union and the uncertainty of the situation concerning the issue of ensuring its digitization, we consider it reasonable to conduct a study of the common and distinctive features of using digital technologies in the educational activities of higher educational institutions of the analysed group of countries.

As evidenced by the results of the grouping of the countries of the European Union in terms of the multidimensional index of digitization in 2019–2021, obtained on the basis of applying the cluster analysis technology based on the k-means method (Table 1), from among the countries of the European Union, three groups are distinguished that can be characterized by the level of digitalization of education as countries with a high level of digitalization, countries with a medium level of digitalization and countries with a low level of digitalization.

**Table 1.**

*Grouping of the countries of the European Union according to the indicator of the multidimensional index of digitization in 2019–2021.*

| Multidimensional Index of Digitization |                |                    |                |                    |                |
|--|----------------|--------------------|----------------|--------------------|----------------|
| 2019                                   |                | 2020               |                | 2021               |                |
| Country                                | Cluster number | Country            | Cluster number | Country            | Cluster number |
| Denmark                                | 1              | Denmark            | 1              | Denmark            | 1              |
| Ireland                                |                | Estonia            |                | Estonia            |                |
| Luxembourg                             |                | Ireland            |                | Ireland            |                |
| The Netherlands                        |                | Luxembourg         |                | Luxembourg         |                |
| Germany                                |                | The Netherlands    |                | The Netherlands    |                |
| Finland                                |                | Germany            |                | Germany            |                |
| Sweden                                 |                | Finland            |                | Finland            |                |
| Austria                                | 2              | Sweden             |                | Sweden             |                |
| Belgium                                |                | Austria            | 2              | Austria            | 2              |
| Estonia                                |                | Belgium            |                | Belgium            |                |
| Spain                                  |                | Bulgaria           |                | Bulgaria           |                |
| Cyprus                                 |                | Spain              |                | Spain              |                |
| Lithuania                              |                | Cyprus             |                | Cyprus             |                |
| Malta                                  |                | Lithuania          |                | Lithuania          |                |
| Portugal                               |                | Malta              |                | Malta              |                |
| France                                 |                | Poland             |                | Poland             |                |
| The Czech Republic                     |                | Portugal           |                | Portugal           |                |
| Slovenia                               |                | France             |                | France             |                |
| Bulgaria                               | 3              | The Czech Republic |                | The Czech Republic |                |
| Greece                                 |                | Slovenia           |                | Slovenia           |                |
| Italy                                  |                | Greece             | 3              | Greece             | 3              |
| Latvia                                 |                | Italy              |                | Italy              |                |
| Poland                                 |                | Latvia             |                | Latvia             |                |
| Romania                                |                | Romania            |                | Romania            |                |
| Hungary                                |                | Hungary            |                | Hungary            |                |
| Slovakia                               |                | Slovakia           |                | Slovakia           |                |
| Croatia                                |                | Croatia            |                | Croatia            |                |

Compiled based on: Noelia Camara (2020a, b; 2022). *DiGiX Update: A Multidimensional Index of Digitalization, 2019–2021*.

In 2019, the first cluster included such countries as: Denmark, Ireland, Luxembourg, the Netherlands, Germany, Finland and Sweden, which position themselves as countries with a binary system of higher education with a traditional university sector and a network of specialized educational institutions; they offer various educational programs for training higher education seekers with an orientation to the needs of foreign student. It should be noted that in such countries, institutions of higher education pay due attention to mastering several foreign languages by students in order to reduce the likelihood of language barriers in the process of implementing the educational process; at the same time, they pay particular importance to the acquisition of knowledge and skills in the use of information technologies, which, in combination with the study of foreign languages, allows training highly qualified and competitive specialists.

It is worth noting the practice of the Netherlands in the field of digitalization of educational activities in higher educational institutions, which is characterized by a stable tradition of training foreign students under bachelor's and master's programs due to the wide use of the English language in the educational process and the possibility of applying distance and mixed forms of education. As a rule, in this country, the risks of language barriers are minimized, and foreign students get the opportunity to demonstrate their own knowledge and abilities in conditions convenient for them. Similar tendencies are observed in higher educational institutions of other countries of the analysed group, which was joined in 2020 and 2021 by Estonia, the higher education system of which is fully in line with European standards.

The second cluster in the analysed period includes the following countries, namely: Austria, Belgium, Bulgaria, Spain, Cyprus, Lithuania, Malta, Poland, Portugal, France, the Czech Republic, and Slovenia, which ensure high quality provision of educational services in the field of higher education and help education seekers in choosing academic disciplines; however, there are certain difficulties regarding the professional adaptation of foreign students and their psychological preparation for communication in a foreign language. At the same time, the development of digital technologies and the process of digitization of higher education in these countries are at the stage of formation, development and integration into the system of European standards, which, to some extent, restrains the opportunities of higher education seekers to implement their own achievements and gain access to a full-fledged education.

The third cluster includes Greece, Italy, Latvia, Romania, Hungary, Slovakia, and Croatia, which have been undergoing transformational restructuring for a long time and have not completed higher education reforms yet. In this group of countries, problems with ensuring communication between foreign students and their perception of educational material are often revealed. Moreover, there are facts of deepening the language barriers, which are caused by the real interaction of students and their functioning as individuals in a group, as well as those caused by the complexity of language perception, problems in expressing one's own opinion, lack of confidence in one's own abilities and opportunities to speak a foreign language. The contradictions in the culture of

communication are equally important in this context, which are manifested in the desire to impose incomprehensible stereotypes, traditions and customs on foreign students.

The outlined problems of the presence of language barriers in teaching foreign students in higher educational institutions of certain countries of the European Union necessitate the search for effective ways, methods and means of overcoming them. It is beyond argument that one of these means is digitalization, which contributes to the intensification of learning processes and obtaining by students of educational services under conditions that are as comfortable as possible for them.

## 6. Discussion

The intensification of the development of digital technologies and their spread to various spheres of social life make it necessary to conduct reformation of the existing education system in the countries of the European Union. The processes of integration into a unified international educational space intensify the need to involve the latest digital technologies in the educational process in order to quickly adapt foreign students to the conditions of study in higher education institutions of another country and their successful acclimatization.

In the course of the research, it has been established that in many countries of the European Union, especially in those that have gone through transformational restructuring (Greece, Italy, Latvia, Romania, Hungary, Slovakia, and Croatia), the processes of strengthening the problems of emergence and deepening of language barriers during the implementation of the educational process with the participation of foreign students are observed. This is primarily due to the insufficiently high level of foreign language mastering in higher educational institutions and the incompleteness of the implementation of European standards of higher education to the conditions of the functioning of national higher education systems.

It should be noted that the countries of the European Union have been divided into three groups according to the degree of digitization of the educational process in which foreign students are involved. The first group consists of highly developed countries according to all indicators (Denmark, Ireland, Luxembourg, the Netherlands, Germany, Finland and Sweden); the second group includes countries with a sufficient level of development (Austria, Belgium, Bulgaria, Spain, Cyprus, Lithuania, Malta, Poland, Portugal, France, the Czech Republic and Slovenia), however, with existing problems in the field of higher education, in particular, with regard to overcoming language barriers in the education of foreign students, forasmuch as innovative digital technologies are used improperly and not to the full extent; the third group includes countries of the transitive type (Greece, Italy, Latvia, Romania, Hungary, Slovakia and Croatia), the process of reforming higher education in which is at the stage of completion, and the intensification of the necessity to apply digital technologies in the education of foreign students is caused more by the problems of providing distance and mixed learning than by ensuring proper conditions for foreign students.

## 7. Conclusions

Thus, the obtained results of the research regarding the main problematic aspects and prospects for the use of digitalization as a means of overcoming language barriers in the education of foreign students makes it possible to state that language barriers in the process of training foreign students manifest as their individual inability to use existing knowledge when expressing their own opinion. It has been proven that in countries with a higher level of digitization of the society, namely: (Denmark (MID: 0,9–1,0), Luxembourg (MID: 0,8–1,0), the Netherlands (MID: 0,9–1,0), Finland (MID: 0,9), Germany (MID: 0,8–0,9), Sweden (MID: 0,8–0,9) and Ireland (MID: 0,8), a lower level of language barriers has been revealed, which, at the same time, is confirmed by the increased study of several foreign languages in higher educational institutions of these countries. It has been established that from among the most common language barriers in the education of foreign students, the following ones should be noted, namely: the difficulty of perceiving and understanding a foreign language, the problems of expressing one's own opinion in a foreign language, and the contradictions of culture, traditions and customs, which can be solved thanks to the development of digital education and by implementing the educational process in an online environment using digital technologies, a simple language and visual methods of communication.

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