**ABSTRACT**

**of the dissertation for the degree of Doctor of Philosophy (PhD) in the specialty 6D011900 – «Foreign Language – Two Foreign Languages» by Zhubanova Sholpan Aldabergenovna, on the topic: «Scientific and methodological basis of foreign language professional-oriented teaching for technical students through an interactive-immersive approach»**

**The relevance of the research** is determined by the dynamic changes in the system of professional foreign language education in Kazakhstan, driven by globalization, technological progress, and the development of an information society, that necessitates the training of competitive specialists who can successfully adapt to the conditions of a digital economy.

Today, foreign language professional-oriented teaching for technical students requires a new approach that takes into account the integration of language with professional disciplines and advanced technologies. The President of the Republic of Kazakhstan, K.K. Tokaev, in his annual address to the people of Kazakhstan titled "Fair state. United Nation. Prosperous Society" (September 1, 2023), emphasized that modern education must meet the new requirements of the digital economy and focus on developing digital competencies along with professional ones.

In accordance with the Concept of digital transformation and the development of the ICT and cybersecurity for 2023–2029, is set to transition to a platform model of digitalization, which necessitates the use of modern teaching approaches and methods by educational institutions. In the Concept of artificial intelligence development for 2024–2029, one of the key requirements is the integration of artificial intelligence into the educational programs of higher educational institutions and the development of technical regulations and national standards that take into account the ethical norms of using artificial intelligence products and technologies. In this context, the proposed scientific research aims to implement an interactive-immersive approach in foreign language professional-oriented teaching, aligning with contemporary educational process requirements and contributing to the improvement of the quality of training technical specialists.

Educational institutions today should not only transmit knowledge but also foster students' sustainable skills in searching, analyzing, and applying information for successful adaptation to the challenges of a rapidly changing world. This requires educators to be able to use advanced technologies, be oriented towards the internal demands of the labor market, and ensure compliance with international standards such as CEFR and BGE in the process of learning a foreign language within the professional sphere.

The conducted research showed that the use of interactive and immersive technologies in foreign language professional-oriented teaching is a strategically important direction necessary for improving the quality of education and developing students' professional skills and communicative abilities.

**The object of the research** is the process of foreign language learning at technical university.

**The subject of the research** is the methodology for forming foreign language professional-oriented competence (FLPOC) of technical students through an interactive-immersive approach.

**The aim of the research** is to theoretically justify, practically develop, and experimentally validate a methodology for forming FLPOC of technical students through an interactive-immersive approach.

In accordance with this aim, the following **objectives** have been outlined:

1. To disclose the essence and structure of FLPOC and to determine its component elements;

2. To develop an integrative model of forming FLPOC of technical students through an interactive-immersive approach;

3. To justify the content of interactive-immersive modules for the formation of FLPOC;

4. To create a digital educational content (DEC) for forming FLPOC of technical students, consisting of the elements of virtual reality, AI instruments, gamification and case simulations;

5. To experimentally verify the effectiveness of the proposed model and methodology of FLPOC implemented through an interactive-immersive approach.

**The methodological and theoretical basis** of the research comprise fundamental works addressing:

- professional foreign language education, specifically theoretical and applied approaches to the formation of professional communicative competence: S.S. Kunanbaeva, T.A. Kulgildinova, K.U. Kunakova, K.K. Zhampeisova, B.A. Zhetpisbaeva, G.D. Zakirova, A.A. Golovchun, P.K. Yelubaeva, K.K. Duisekova, T.V. Mikhailova, N.K. Omarov, L.Yu. Minakova, H. Denise, S. Brauer, A. Scarino, A.J. Liddicoat, M. Biram, S.Ya. Batysheva, V.A. Adolf, and others;

- The informatization and digitalization of education, as well as the integration of advanced technologies into foreign language education: G.K. Nurgalieva, D.M. Jusubalieva, A.T. Chaklikova, A.I. Tajigulova, Ye.V. Artykbaeva, K.B. Zhaksylykova, G.A. Rizakhodjaeva, M. Avazmatova, I.A. Kolegov, I.A. Levina, B. Arisoy, Ph. Kirkman, K. Jones, S. Speicher, G. Molnar, and others.

**Research methods.** In accordance with the aim and objectives of the study, the following methods were employed: general scientific methods – analysis, synthesis, modeling, classification; theoretical methods – studying domestic and foreign literature, analysis of strategic documents from the Ministry of Education and Science of the Republic of Kazakhstan; empirical methods including observation, surveys, testing, description, the interview method, formative and summative experiments, as well as statistical methods for processing research results.

**Main provisions presented for defense:**

**Provision 1.** Professional foreign language education in the Republic of Kazakhstan, in the context of globalization, requires the implementation of a competency-based, individualized, interdisciplinary, and digital model of education, aimed at the formation of FLPOC of technical students with a component structure of sub-competencies: linguistic, socio-linguistic, discursive, and strategic. This is achieved through the integration of advanced digital technologies and the use of various educational strategies to create a flexible and multi-level educational environment.

**Provision 2.** The concept of the interactive-immersive approach to the formation of FLPOC of technical students represents a synergistic model of pedagogical strategies that integrate interactive engagement and virtual immersion in authentic professional contexts for deep internalization of knowledge, optimization of cognitive, socio-emotional, and intercultural components of learning. It is based on the principles of adaptability, interactivity, and interdisciplinary integration, creating a systematic approach to the educational process, emphasizing the development of autonomy, critical and analytical thinking, while also enhancing students' readiness to tackle the challenges of a dynamic professional world and facilitating more effective foreign language acquisition of a foreign language in the context of their profession.

**Provision 3.** The integrative model of FLPOC, implemented through an interactive-immersive approach, synthesizes theoretical and practical knowledge into digital educational content, actively engaging students in the learning process and ensuring systematic formation of FLPOC through conceptual-targeted, content-based, organizational-technological, and result-evaluative components. This adapts the educational process to the demands of professional activities and increases student motivation and involvement in learning a foreign language within their professional training.

**Provision 4.** Interactive-immersive modules that implement the integrative model of FLPOC of technical students serve as an innovative tool for integrating language training and professional skills, creating a context for immersing students in real professional-immersive cases. The unique methodological structure of these modules, which consists of linguistic, socio-linguistic, discursive, strategic, and digital components, ensures comprehensive training for specialists capable of effective intercultural communication and adaptation to international activities.

**Provision 5.** The methodology for forming FLPOC of technical students through the staged implementation of interactive-immersive modules integrated with DEC includes experimental verification, consisting of diagnostic, formative, and summative stages, which contributes to enhancement of professional skills and the formation of linguistic, socio-linguistic, discursive, and strategic sub-competencies in the context of maritime studies.

**Research base:** Kazakhstan Maritime Academy (KMA) at the Kazakh-British Technical University in Almaty.

**The scientific novelty** of the dissertation research include:

1. The clarification of the FLPOC structure and its components;

2.The development of a concept for implementing an interactive-immersive approach, based on a combination of principles for the formation of FLPOC and principles for selecting DEC, ensuring the effective achievement of educational goals;

3. The proposal of an integrative model of FLPOC as a set of criteria and indicators reflecting the transformation of traditional foreign language education experience into a digital format;

4. The justification of the content of interactive-immersive modules of FLPOC, implemented through an interactive-immersive approach;

5. The identification of conditions for using DEC, which contribute to the formation of FLPOC of modern technical specialists.

**The theoretical significance of the research** lies in revealing the pedagogical basis for implementing the interactive-immersive approach in the process of forming FLPOC of technical students.

**The practical significance of the research** lies in developing of DEC, consisting of the elements of virtual reality, artificial intelligence tools, gamification and case simulations, as well as a series of interactive-immersive exercises and tasks aimed at forming FLPOC.

**The validity and reliability** of the scientific provisions, practical recommendations, and conclusions drawn from the research are supported by the results of experimental studies, successful presentations of key findings at several leading *international scientific-practical conferences*, such as «Going Global» (London, 2017); «Innovations in Professional Education» (Yekaterinburg, 2019); «Science as a Driving Force in Crisis» (Ukraine, 2019); «Science and Education in the 21st Century» (Astana, 2020); «Education and New Technologies» (online platform EdCrunch, 2022); «Information Science and Information Literacy» (Brasov, 2022); «Satbayev Readings -2021» (Almaty, 2021); «University 4.0. Digital Transformation» (Belarus, 2021); *at the republican competition* of research projects for young scientists on the topic «My Vision of Resolving the Consequences of the COVID-19 Pandemic» (II-degree, Almaty, 2020); *at the republican forum* for Academic Integrity League on the topic «Pedagogical Innovations Supporting Academic Honesty» (Almaty, 2023); *at research seminars* of the internship (Erzurum, 2019); and *at methodological seminars* at AUES, KBTU, Satbayev university, and ATU (Almaty, 2019-2024).

**The approval and implementation of the research** results were reported at the meetings of the Postgraduate Department at Ablai khan KazUIR&WL, and published in 41 scientific publications, including 12 in journals recommended by the Committee for Quality Assurance in Science and Higher Education of the Ministry of the Republic of Kazakhstan, 16 in international scientific-practical conferences, 8 in foreign scientific journals, 3 in a republican conferences, as well as two foreign publications in ranked journals indexed by Scopus (1) and Web of Science (Core Collection) (1).

Additionally, the results of the scientific research include a collective KBTU monograph titled «Teacher’s Guidelines: A Practical Approach to Raising SDG Awareness» (2024); participation in the creation of AI STEP courses for KBTU; and the integration of AI-tutors into KBTU educational program «Maritime Terminology». The external evaluation was conducted by specialists from the Department of Computer Education and Instructional Technology at Atatürk University (Erzurum, Turkey).

1. Digital Educational Content in Foreign Language Education//Opción. - 2020. - Vol. 36, Special No. 27. - pp. 3-24 *(The author’s contribution is 96%);*
2. Digital Educational Content as an Innovative Pedagogical Technology and Its Didactic Potential in Professionally-Oriented Foreign Language Teaching//Ad Alta: Journal of Interdisciplinary Research. - 2018. - Vol. 8, Special Issue 4. - pp. 57-67 *(The author’s contribution is 95%);*
3. Interaktivno-immersivnyi podxod v formirovanii inoyazychnoi professionalno-orientirovannoi kompetencii studentov tehnicheskogo profilya//Izvestiya. KazUMOiMYa imeni Abylai hana.- Almaty, 2025 *(The author’s contribution is 95%);*
4. Immersive virtual reality in foreign language education: sustainable development goals in action//Sciences of Europe.-2025.-No 157.- pp.53-59 *(The author’s contribution is 97%);*
5. Integrating mixed (AR & VR) reality into EFL teaching in Kazakhstani secondary school//Bulletin of Ablai khan KazUIR&WL.-Almaty, 2024.- 72 № 1.- C.394-407 *(The author’s contribution is 96%);*
6. Agylshyn tilin uyrenushilerdin yntasy men yntymaqtastygy tsifrlyq tehnologiyalar arqyly arttyru//Izvestiya. KazUMOiMYa imeni Abylai hana. - Almaty, 2023. - Tom 72 № 1. - C. 236-247 *(The author’s contribution is 45%);*
7. Model formirovaniya inoyazychnoi professionalno-orientirovannoi kompetencii studentov neyazykovyh specialnostei posredstvom virtualnoi (VSO) i personalnoi sredy obucheniya (PSO)//Nauka i zhizn Kazaxstana.- Almaty, 2019.- №9/1.- S.129-139 *(The author’s contribution is 100%);*
8. Developing auditory and visual skills through multimedia technologies//[Bulletin Abay Kazakh National Pedagogical University](https://articlekz.com/en/article/magazine/122" \o "BULLETIN Abay Kazakh National Pedagogical University).-Almaty, 2017.- №2(54).- C.293-297 *(The author’s contribution is 95%);*
9. Inoyazychnoe professionalno-orientirovannoe obuchenie mezhkulturnomu obshheniyu studentov neyazykovyh specialnostei: novye texnologii//Vestnik ZKGU.-Uralsk, 2017.- №3(67) – S.110-116 *(The author’s contribution is 100%);*
10. The impact of electronic trends on foreign language education//Nauka i zhizn Kazahstana.-Astana, 2017.- №4 (48).- S.203-208 *(The author’s contribution is 100%);*
11. Inoyazychnaya professionalno-orientirovannaya kompetenciya studentov nelingvisticheskih specialnostei v cifrovoi epohe//Doklady Kazaxskoi Akademii Obrazovaniya.-Astana, 2017.- №4.- S.167-175 *(The author’s contribution is 100%);*
12. Kriterii rezultativnosti inoyazychnogo professionalno-orientirovannogo obucheniya s primeneniem innovacionnyh texnologii//Nauka i Zhizn Kazahstana.-Astana, 2017.- №5 (49).- S.105-111 *(The author’s contribution is 96%);*

**The structure of the dissertation.** The dissertation consists of an introduction, three sections, a conclusion, a list of references, and appendices.

In the introduction, the relevance of the chosen topic is justified, the degree of its development is defined, and the goals and objectives of the research are outlined. The object and subject of the study are formulated, along with the statements to be defended.

The first section of the dissertation examines contemporary trends in the development of professional foreign language education in higher education institution, specifically focusing on the competency-based model of education, interdisciplinary approach, individualized learning, and digitalization. A theoretical analysis of the psychological- pedagogical, and linguistic literature regarding the specifics of digitalization in foreign language professional-oriented teaching for technical students is conducted, revealing the conceptual essence and structure of forming FLPOC.

The second section justifies the concept of implementing an interactive-immersive approach, encompassing principles for forming FLPOC and the criteria for selecting DEC; it develops an integrative model for forming FLPOC through the interactive-immersive approach and identifies the descriptors of FLPOC of students in technical area. Additionally, it defines the structure and content of interactive-immersive FLPOC modules, which comprise linguistic, sociolinguistic, discursive, strategic, and digital components.

The third section discusses the staged implementation of the methodology for forming FLPOC of technical students through the interactive-immersive approach. An experimental verification of the model and methodology for forming FLPOC using DEC is conducted.

The conclusion presents the main results of the conducted research as well as outlines the further research prospects.