TRANSLATION TRAINING OF FUTURE PHILOLOGISTS USING MODERN INFORMATION TECHNOLOGIES

[a]VIKTORIIA IHNATENKO, [b]IRYNA VAKULYK, [c]IRYNA VORONIUK, [d]MYKOLA PROKHOROV, [e]HALYNA MELEKH

[a]Bila Tserkva National Agrarian University, 8/1, Soborna Sq., Bila Tserkva, 09117, Kyiv oblast, Ukraine
[b]National University of Life and Environmental Sciences of Ukraine, 15, Heroyiv Oborony Str., 03041, Kyiv, Ukraine
[c]National University Zaporizhzhia Polytechnic, 64, Zhukovsky Str., 69063, Zaporizhzhia, Ukraine
[d]Yuriy Fedkovych Chernivtsi National University, 2, Kotsiubynskoho Str., 58012, Chernivtsi, Ukraine
[e]Drohobych Ivan Franko State Pedagogical University, 24, I.Franka, Str., 82100, Drohobych, Ukraine
email: [a]victoria_ignatenko@btsau.edu.ua, [b]vakulyk@ukr.net, [c]Irynavoronyuk@gmail.com, [d]m.prokhorov@chnu.edu.ua, [e]melekhhelen@gmail.com

Abstract: The article represents an attempt to systematize specific features of translation training of future philologists within the environment of digital transformation. Special attention is paid to the necessity of shaping in future graduates the competence sufficient to effectively work in the sphere of B2B translation services. A concept of today integrative competence of future philologists-translators is covered and the need to apply a cross-disciplinary approach to designing curricula for teaching translation is emphasized. Core specifics and challenges of teaching localization is investigated in detail, based on both theoretical provisions and case studies. A potential of gamification and AI/ML application in translation training is outlined.

Keywords: translation training, digital transformation, IT, gamification, localization, competence.

1 Introduction

The digital educational environment is the reality in which modern society lives today. In the digital learning environment, students in higher educational institutions develop many important qualities and skills that are in demand by 21st century society. They determine the personal and social status of a modern person: information activity and media literacy, the ability to think globally, the ability for continuous education and solving creative problems, willingness to work in a team, communication and professional mobility. Therefore, it is not difficult to imagine that the next period in professional education will be devoted to the formation of a new generation of specialists who have digital competencies and are ready to function in the digital space of modern society [25]. Consequently, the vocational education system will be modernized, and there will be a need to provide educational institutions with modern equipment, digital educational technologies, and relevant teaching staff capable of transforming the entire educational process.

It should be noted that the educational process at a higher education institution that employs digital technology encourages each student to work autonomously, produces a favorable communicative environment, and provides all of the circumstances for the development of an individual's creative potential. The use of digital technologies increases students' motivation and cognitive activity, improves individualization, differentiation, and intensification of the learning process, broadens and deepens interdisciplinary connections, systematizes and integrates knowledge of individual academic disciplines, organizes systematic and reliable control, and eliminates subjectivity in assessment [19,23].

Researchers note that the advantage of integrating digital technologies into the educational process is that they allow students to control the strategies and resources from which they learn, thereby personalizing their learning experience [27]. Digitalization promotes innovation in the field of education, including changes in methods and approaches to teaching and management of educational resources. At the same time, the penetration of digitalization into teaching processes contributes to the effective use of quality educational resources by students and constant innovation in higher education institutions [22]. Adaptation of education to the capabilities and abilities of students since all subjects of the educational process feel comfortable, and, consequently, motivation to learn increases.

In particular, the digital educational environment allows future philologists to use a wide range of modern information technologies, including when learning translation.

The introduction and development of digital technologies, digitalization and digital transformation of a translator's professional activity have changed traditional ideas about his professionalism. A modern professional translator must not only speak his native and foreign languages, know the basics of translation, and be an expert in a specific subject area, but also be able to use the latest IT as tools for his work, which allow him to significantly reduce the time spent searching for dictionaries, reference books, translation equivalents and correspondences, make design of the translation text depending on the customer's requirements, etc.

Furthermore, translation-oriented technology, i.e., those specifically designed for translators, may not only suit translators' needs, such as greater usability, flexibility, and integration with other resources or devices. They may also create new needs (for example, the continuous release of new versions of translation memory systems or the emergence of competitors in the translation memory market) or require translators to broaden their skill set (by managing crowd translation projects, participating in collaborative pro bono translation, or post-editing machine-translated texts). In actuality, if we look at the big picture, we could find that we, as individuals, are far more than "one or two steps behind" technology.

Digital technologies have served as 'enablers' of translation (e.g., machine translation for non-translators or monolingual individuals), 'facilitators' of translation (e.g., translation memory systems for translators), and even the 'object' of translation (e.g., software and websites that must be translated). As a result, technological advancements have called into question our understanding of translation (as a product, a process, or a phenomenon), to the point that any attempt to prescribe or idealize a translation process is doomed to be oversimplistic or out of date from the start. Individual preferences/skills and a variety of circumstances now drive translation processes, including budget, institutional or national regulations, technological resources, time, client requests, quality expectations, text type, subject matter, and translator availability for a specific language pair, to name a few. In certain circumstances, the technology selected by the language industry may have the last say on translator behavior when it comes to translation, pre-editing, post-editing, localization, editing, and rewriting. Even in the university classroom, the teacher is unlikely to know how students are performing their translation tasks as they progress at their own risk along a continuum from translating strictly (i.e., using only or mostly their own mental resources) to translating broadly (e.g., slightly post-editing MT outputs or at least drawing "inspiration" from MT outputs).

Evidently, the landscape of information technologies used in translation became very multifaceted and convergent, which necessitates appropriate agile transformation of the concept, strategies, and tools applied in translation training, especially for the area of philology specialties.

2 Materials and Methods

The work uses theoretical methods of summarizing and analyzing scientific data on the research problem (from the standpoint of pedagogy, translation studies, psychology, psycholinguistics, didactics, etc.), modeling the process of learning to translate scientific and technical texts using IT. The

concept of digital transformation is education is employed throughout of the research.

3 Results and Discussion

Translation is experiencing a time of revolutionary change. The impact of digital technology and the internet on translation is ongoing, extensive, and significant. The translation revolution is all around us, from automatic internet translation services to crowdsourced translation and the spread of smartphone translation apps. This revolution will have far-reaching and severe consequences for human languages, civilizations, and society. In the Information Age, often known as the Translation Age, new ways of speaking and thinking about translation that account for substantial developments in the digital world are urgently required. In 2012, Michael Cronin [8] investigated the role of translation in the debates surrounding emerging digital technologies, attempting to analyze their social, cultural, and political consequences, guiding readers through the origins of translation's engagement with technology as well as the key issues of the twenty-first century. Cronin questions the dominant instrumentalist conceptions of language, which result in "the tyranny of transitivity in translation understandings". Instead, he suggests translation as an intransitive activity, which means that it does not have to correspond to an aim of "producing" anything, but might be a goal in and of itself. This has implications for our understanding of translation and the relationship between translators and technology. For example, it questions long-held divisions like "culture language" and "service language", and it reveals a "dance of agency" between translators and technology. Drawing on Iulia Mihalache, Cronin contends that the digital age has resulted in a change from "information society" to "interaction society" [4, 8]. The digital age evolves into the interaction age.

Translators nowadays are referred to as "co-creators of digital transformation" [28], and it is critical to implant this concept in students, promoting their ongoing growth in the IT environment within the area of translation. According to Turkish researcher Çakici [5], the increase of tech-savvy customers and their new demands forces businesses to rethink their business strategies in order to react to this changing market. In this sense, digital transformation improves the customer experience and satisfies digitally empowered consumers by integrating digital technology into all aspects of a business, changing how a company runs and provides value to customers. The generation of value is replaced by co-creation, which engages both customers and businesses in the value creation process.

The transition of many businesses from a typical goods-dominant (G-D) to a service-dominant (S-D) rationale has sparked more VCC and service research, and translations are now part of the conversation. Figure 1 depicts the whole paradigm transition from G-D to S-D logic.

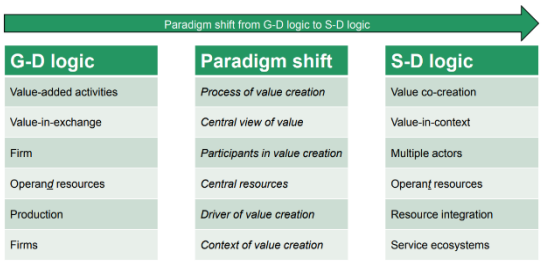

Figure 1. Paradigm shift from G-D logic to S-D logic [28]

The research on value co-creation predominantly focuses on two theoretical dimensions, each containing three parts [18]:

1. Value co-production

- Sharing of knowledge
- Sharing of control
- Actor interaction

2. Value-in-use

- Experience
- Personalization
- Relationship

With the rise of digitalization, value creation is once again driven by how its players use digital technologies. As a result, this is also common in the translation field. Today's consumers, particularly in the B2B sector (the largest area of the translation business), are technologically sophisticated and want translators to be proficient in using IT tools. The interaction between the customer and the CEO in the B2B translation industry is continual and collaborative, with value co-creation taking place. Future philologists will lack the competency required in today's digitally altered environment unless they comprehend the principles of cooperation and value co-creation.

One of the crucial challenges of teaching translation is to shape cross-disciplinary skills in students – first of all, cross-cultural skills and strong capability of understanding cultural and cognitive context of target language.

Translation cannot simply replace terms from one language with comparable words from the target language ('metaphrase'). Translators must resist the urge to reuse source language (SL) vocabulary in the target language ('transliteration'); instead, they must popularize comparable terminology in the target language (TL) or create new phrases that are more indicative of the TL and culture of TL communities. Translation must bring the text closer to the local culture in order to convey meaning. Translated resources must be concise, with no detailed explanations or remarks on the source text.

Translation is a difficult process that involves a variety of talents. The translator must be able to read and write both the SL and TL. She/he must grasp the substance of the SL and write it in the context of the TL. This also need a strong vocabulary, including mastery of terms and idioms in both languages to represent cultural subtleties in translation, as well as a reasonable understanding of the area. For articles about Mathematics instruction, the translator must be conversant with the concepts and idioms used in Mathematics, as well as have a larger grasp of education, its philosophies and methods.

Translation allows readers to comprehend and benefit from the culture of those who speak the SL. It also adds fresh thoughts to the TL. According to investigators, "when we evaluate concepts across cultures, we cannot be looking for equivalences, but only for the potential to bear possible meanings, what is referred to as "meaning-bearing capacity"" [13]. Translation "requires not formal equivalence but affective equivalence" [21]. The problem is to convey the substance of the piece, such that a TL reader can have similar experiences to the SL reader while remaining in their own environment. Given these intricacies, 'translation' is frequently referred to as 'trans-creation' [14].

Localization is one of the specialized topics of translation that pose a significant challenge to both students and professors of philology specializations. Localization refers to the linguistic and cultural adaptation of a product or content to a specific market or region, such as a nation or area with its own culture and language. Translation is one of its essential steps, but other procedures include adapting design, visuals, layout, local formats, currencies, and units of measurement; "modifying content to suit the tastes and consumption habits"; and "addressing local regulations and requirements" [21].

A maxim in game localization is that it is meant to give its consumers from various nations with distinct experiences as if its goods had been designed specifically for them as end users [17]. Even while this maxim is coherent from a commercial standpoint, applying it to academics misses numerous breakthroughs in Translation Studies since it insists on giving the target cultural player with the same gaming experience as the original version's players. Some works in Translations Studies promote the translator's invisibility [26] and the notion of

translation as a neutral practice of "transferring" content from a source language into a target language [6], despite Bernal-Merino's claims that we can learn the concepts of “co-creating” and “shared-authorship” in recognition of the necessary translator input.

Despite the rapid growth of the localization sector and the establishment of multiple translation training programs globally, industry and academics have progressed independently and neglected one another in a variety of ways [9]. For instance, unauthentic materials and tools for localization learning have been used in translation programs, usually from a theoretical rather than a practical standpoint. Meanwhile, the translation industry seems to ignore intertextuality/hyperlinks, multimodality, and narrative sequence, hiring multiple translators or translation agencies to translate spreadsheets devoid of context, images, and videos. Additionally, a number of scholars have insisted on focusing only on the linguistic features of multimedia interactive entertainment software (MIES) products [3], ignoring the usage of both user- and non-user-friendly technology as well as non-linear storytelling [7]. Trainers and academics who work with translation technology, like us, seem to favor one translation tool over another at the same time, instead of emphasizing fundamental skills that should enable students to adjust to the various needs and preferences of clients or agencies as well as the quick changes in translation technology [2].

Thus, translation training of future philologists should be built on multidisciplinary paradigm, for shaping integrative competence, which includes not only linguistic knowledge and skills, but also cross-cultural skills, customer management skills, basic array of knowledge in STEM fields [12]. For this, AI and ML technologies, as well as gamification tools seem to be not only expedient but obligatory for application in higher educational institutions.

Despite the tremendous expansion of the game localization business in recent years, translation undergraduate curricula still lack official instruction in game localization, frequently leaving rookie translators with little choice except to seek out the necessary skills informally in game translation forums. Designing a video game localization course for translation undergraduate programs at public universities is a challenging task in today’s environment, especially considering the scarcity of free and legitimate materials. Esqueda and Stupiello’s paper [11] describes a game localization teaching experience at the undergraduate level in Brazil, with a particular emphasis on how to handle the linguistic assets of the online race game SuperTuxKart, while also attempting to shed some light on potential entertainment software translation requirements and their incorporation into translation programs.

One of the most difficult issues in localization is producing clear and succinct language within the constraints of a user interface. Translators working with localization must be highly imaginative in order to correctly capture the same message as the original while without exceeding the allowable amount of characters [10]. Furthermore, the online arena has provided corporations with access to customer input on Massive Multiplayer Online (MMO) games, enhancing the sophistication of video games that mix graphic and filmic arts, literature, computer science, and audiovisual communication. One of the challenges posed by these various game platforms is how to teach translation students the knowledge and skills needed to comprehend the medley of archives that comprise these multimodal materials to be translated and localized into another language, given that the primary strategy of this industry is to reach out to different locales with the promise of guaranteed playability and gameplay experience among people from various countries.

Localization tools are always being developed and refined to allow translators to manipulate such contents with a target market in mind, because different approaches are needed when translating different types of linguistic content in a game (such as manuals, packaging, “read me” files, official web sites, dialogues for subtitling, dubbing, and voice-over, including the user interface). Similarly, traditional training techniques must be evaluated and altered to correspond with the evolving image of localization competence. Translation and localization training, as well as translation tools for localization projects, must be priority. One step toward this objective may be to incorporate a game localization teaching experience into undergraduate translator training, as recommended by Esqueda and Stupiello [11]. These authors claim that, while many (commercial) CAT (Computer Aided Translation) tools can read various file formats in order to make the translator’s or localizer’s job easier (by extracting the translatable text and protecting the rest of the content), the majority of them cannot read open-source .pot files. Because .pot and .po files are already meant to be free and open-source, the full translation process may be completed with free and open-source localization tools like Drupal, Poedit, or Virtaal.

Translation entails not only language and cultural transmission, but also the adaptation of visuals, pictures, re-designing the source material or production in the target location, and so on. As a result, in courses that include game localization, student translators must also learn about computer technology, software engineering, and how to use translation tools. To achieve this goal, the associated courses must be supplemented by optional courses from other departments that focus on technology (e.g., computer engineering, software engineering, computer programming) [16]. The digital revolution causes profound changes in the translation profession, requiring practitioners to master new information and abilities or gain new competencies.

However, evidently, it relates not only to game localization, but to localization of business software, as well as translation of law documents, reports and White papers, etc. The nation-specific features should be taking into account in any translations. Moreover, even complex international affairs aspects should be considered by a translator [20], in order to attempt to avoid “sharp corners” in text and provide more “streamlined shape”.

To far, the most successful application of gamification in translation and localization has been crowdsourcing models that trade recognition for project effort. Facebook, LinkedIn, and Steam have all seen success - and occasional controversy - with this strategy. Even commercial product developers have found success with gamified components in efforts to bridge the language divide for areas that do not warrant a full-fledged commercial translation effort [1].

Duolingo, one of the most renowned adopters of gamification in the language area, provides language learning classes and rewards users with badges for utilizing the platform. Although site visitors would be hard pressed to tell that Duolingo is anything other than a language-learning tool, it began as a commercial translation business that tried to convert language learners’ efforts into quality translation. The company’s marketing no longer stresses this feature, although its terms of service indicate that it still provides these services. Gamification engages site users in their duties and ensures that they continue to work on the tasks required by Duolingo to deliver commercial services.

Another famous example, which may precede the emergence of gamification, is ProZ;s KudoZ platform. KudoZ are points awarded to translators who assist other linguists. Translators with more points rank higher in search results and are more likely to be picked for paid work through the platform. In this situation, the goal is to combine compassion and self-interest so that translators may help one another. This platform may be effectively utilized in the educational process to immerse students in the real world of translation.

The Content and Language Integrated Learning (CLIL) technique, which is based on an integrated multidisciplinary approach, can help students enhance their language proficiency [29]. It encourages international understanding and innovative thinking, as well as the development of professional and general language skills [15]. The LISTiG13/LISST14 e-learning system

is a useful instrument for building intellectual linguistic resources [24,28]. This intelligent tool was created with the help of several companies, including university research units and respected non-university units with a global reputation in the IT sector and linguistic tool creation. The LISST/LISTiG system is a complicated instrument that combines translation and glotodidactic e-learning methodologies. It gives pupils immediate feedback in reaction to the information they enter, including song lyrics. Students who complete translation tasks receive thorough feedback on their translated sentences. The technology also automatically identifies different sorts of translation faults and offers students with information so that they may remedy them. The teacher interface enables students to become acquainted with various translation possibilities and link error messages with specific linguistic occurrences. The technology also automatically assesses typed texts for grammar and spelling, comparing them to accurate translation versions and example responses already entered by teachers. Students receive automated feedback messages that indicate flaws in their translations when compared to example replies. The system also analyzes specific sentence fragments input by students to information already recorded by the instructor.

Yuxiu [30] presented an intelligent translation teaching method using artificial intelligence translation technology to address the shortcomings of the current teaching approach. The system primarily decodes and encodes the original text using a neural machine translation algorithm to produce the related translation. Simultaneously, a statistical machine translation technique was utilized to create a natural language translation model, which improved translation quality and accuracy. This allows teachers and students to benefit from a novel learning experience while also reforming traditional translation instruction.

The AI translation teaching system module may assist students grasp and master translation abilities, as well as improve translation quality and efficiency. Figure 2 shows the modular structure of Yuxiu's proposed artificial intelligence translation training system.

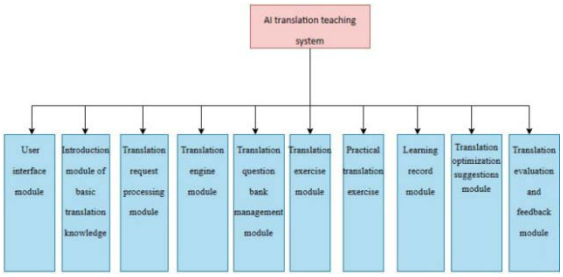

Figure 2. AI translation teaching system module [30]

By integrating the necessary modules indicated in Figure 2, this system may provide students with focused, efficient, and adaptable translation teaching aid services, meeting the aim of increasing students' translation abilities. Meanwhile, it may successfully assist instructors in understanding and mastering students' translation capabilities, as well as providing teachers with focused, individualized instruction based on students' various translation abilities.

Thus, the landscape of IT tools and digital strategies expedient in translation teaching of future philologists is very broad, and every educational institution can choose among them what is best aligned to the institution' profile and curriculum design. At the same time, as it was noted above, an integrative cross-disciplinary approach should be applied, to shape students' competence which would allow graduates working successfully in any sector of translation services, including B2B.

Literature:

1. Alcaide-Martínez, M., & Taillefer, L. (2022). Gamification for English language teaching: A case study in translation and interpreting, *Lebende Sprachen*, 67(2), 283-310, DOI: 10.1515/les-2022-1015
2. Bećirović, S., Brdarević-Čeljo, A. & Delić, H. (2021). The use of digital technology in foreign language learning. SN Social Science, 1, 246, DOI: 10.1007/s43545-021-00254-y
3. Bernal-Merino, M. (2015). Translation and localisation in video games: Making entertainment software global. Routledge, DOI: 10.4324/9781315752334
4. Borodin, Y., Sorokina, N., Tarasenko, T., Volkova, N., Akimova, L., & Akimov, O. (2023). Social policy development in the conditions of digital transformation of society. *Ad Alta: Journal of interdisciplinary research, 13*(01), XXXIV, 40-46. DOI: 10.33543/1301344046
5. Çakıcı, N. (2022). Digital transformation and co-creation of value: The role of digital agility. In: M. Rodrigues & J. Proenca, eds. Impact of digital transformation on the development of new business models and consumer experience, 23-36. IGI Global, DOI: 10.4018/978-1-7998-9179-6.ch002
6. Catford, J. (1965). A linguistic theory of translation. Oxford University Press.
7. Coelho, B., & da Silva, I. (2017). Towards a multimodal methodology for the analysis of translated/localised games. Domínios de Lingu@Gem, 11(1), 6-16, DOI: 10.14393/DL28-v11n1a2017-1
8. Cronin, M. (2012). Translation in the digital age. Taylor & Francis, DOI: 10.4324/9780203073599
9. Da Silva, I., Bernal-Merino, M., & Esqueda, M. (2020). Translation and digital technology: Practices, theories, research methods, and the classroom. *Belas Infieis*, *9*(4), 3-13, DOI: 10.26512/belasinfieis.v9.n4.2020.31444
10. Diaz, I., Cespon, M., Lage, J., Perez, S. (2023). *Current trends on digital technologies and gaming for teaching and linguistics*. Peter Lang.
11. Esqueda, M., & Stupiello, E. (2018). Teaching video game translation: first steps, systems and hands-on experience. *Linguagem e Tecnologia*, *11*(1), 103-120, DOI: 10.17851/1983-3652.11.1.103-120
12. Gavkalova, N., Akimova, L., & Akimov, O. (2023). Anti-crisis Management Mechanism in the Digital Age. *Marketing and Management of Innovations*, *14*(4), 188–199. https://doi.org/10.21272/mmi.2023.4-14
13. Harrak, Y. (2017). *Translation and cultural/contextual constraints*. LAP LAMBERT Academic Publishing.
14. Katan, D., & Taibi, M. (2021). *Translating cultures*. Routledge.
15. Kruger-Marais, E. (2024). Subtitling for language acquisition: Eye tracking as predictor of attention allocation in education. *International Journal of Language Studies*, *18*(2), 129-150, DOI: 10.5281/zenodo.10475319
16. Odacioglu, M., Loi, Ch., Kokturk, S., Uysal, N. (2016). The position of game localization training within academic translation teaching. *Journal of Language Teaching and Research*, *7*(4), 675-681, DOI: 10.17507/jltr.0704.06
17. O'Hagan, M. (2020). *The Routledge handbook of translation and technology*. Routledge.
18. Ranjan, K., & Read, S. (2016). Value co-creation: Concept and measurement. *Journal of the Academy of Marketing Science, 44*(3), 290-315.
19. Palshkov, K., Shetelya, N., Khlus, N., Vakulyk, I., & Khyzhniak, I. (2024). Impact of mobile apps in higher education: Evidence on learning. *Amazonia Investiga*, *13*(74), 115-128, DOI: 10.34069/AI/2024.74.02.10
20. Sapała, B., & Turska, M. (2022). The recovered past? Deliberations on translation in the context of historical knowledge and collective memory. *Babel*, *68*(1), 114-138, DOI: 10.1075/babel.00252.sap
21. Scholz, K. (2012). *The art of translation: With special reference to English renditions of the prose dramas of Gerhart Hauptmann and Hermann Sudermann*. Nabu Press.
22. Siregar, M. (2019). Pedagogical translation use by scientific approach in teaching English. *Budapest International Research and Criticsin Linguistics and Education (BirLE) Journal*, *2*(4), 111-119, DOI: 10.33258/birle.v2i4.524
23. Vakulyk, I., Koval, V., Lukiianchuk, I., Romanenko, N., & Grygorenko, O. (2022). Formation of a professional communication culture among the students using information

technologies. *IJCSNS International Journal of Computer Science and Network Security*, *22*(9), 12-22. DOI: 10.22937/IJCSNS.2022.22.9.12
24. Vakulyk, I., Vasylyshyna, N., Vyselko, A., Lakhmotova, Yu., & Ponomarova, M. (2023). Organization of students' independent work for learning English in the modern conditions of digital education: Comparative context of China and Europe. *Ad Alta*, *3*(2), 63-73, WOS:001027993900010
25. Vaniushyna, O., Gaivoronska, T., Dunayeva, L., Lanska, S., Kuzmina, M., Varnava, U. (2024). Social and psychological prevention of professional burnout of social sphere employees under the conditions of the martial law. *Ad Alta: Journal of interdisciplinary research*, *14*(1), XL, 78-81. https://www.webofscience.com/wos/woscc/full-record/WOS:001222983700007
26. Venuti, L. (1995). *The translator's invisibility: A history of translation*. Routledge.
27. Waller, L. (2022). *Digital transformation for higher education institutions: A framework for the future*. Ian Randle Publishers.
28. Winter, R. (2017). *A language for value co-creation*. University of St.Gallen, Institute of Information Management.
29. Yefymenko, T., Bilous, T., Zhukovska, A., Sieriakova, I., & Moyseyenko, I. (2024). Technologies for using interactive artificial intelligence tools in the teaching of foreign languages and translation. *Amazonia Investiga*, *13*(74), 299-307, DOI: 10.34069/AI/2024.74.02.25
30. Yuxiu, Yu. (2024). Application of translation technology based on AI in translation teaching. *Systems and Soft Computing*, *6*, 200072, DOI: 10.1016/j.sasc.2024.200072

Primary Paper Section: A

Secondary Paper Section: AE