SCI-CONF.COM.UA

INTERNATIONAL EXPERIENCE IN SCIENTIFIC RESEARCH

PROCEEDINGS OF XII INTERNATIONAL SCIENTIFIC AND PRACTICAL CONFERENCE JULY 9-11, 2026

CHICAGO 2026

UDC 001.1

The 12th International scientific and practical conference "International experience in scientific research" (July 9-11, 2026) BoScience Publisher, Chicago, USA. 2026. 301 p.

ISBN 978-1-73981-121-1

The recommended citation for this publication is:

Ivanov I. Analysis of the phaunistic composition of Ukraine // International experience in scientific research. Proceedings of the 12th International scientific and practical conference. BoScience Publisher. Chicago, USA. 2026. Pp. 21-27. URL: https://sci-conf.com.ua/xii-mizhnarodna-naukovo-praktichna-konferentsiya-international-experience-in-scientific-research-9-11-07-2026-chikago-ssha-arhiv/.

Editor
Komarytskyy M.L.
Ph.D. in Economics, Associate Professor

Collection of scientific articles published is the scientific and practical publication, which contains scientific articles of students, graduate students, Candidates and Doctors of Sciences, research workers and practitioners from Europe, Ukraine and from neighbouring countries and beyond. The articles contain the study, reflecting the processes and changes in the structure of modern science. The collection of scientific articles is for students, postgraduate students, doctoral candidates, teachers, researchers, practitioners and people interested in the trends of modern science development.

e-mail: chicago@sci-conf.com.ua

homepage: *https://sci-conf.com.ua*

TABLE OF CONTENTS

AGRICULTURAL SCIENCES

VETERINARY SCIENCES

MEDICAL SCIENCES

PHARMACEUTICAL SCIENCES

TECHNICAL SCIENCES

POLITICAL SCIENCES

PHILOLOGICAL SCIENCES

ECONOMIC SCIENCES

LEGAL SCIENCES

PHILOLOGICAL SCIENCES

UDC 378:81'243:004

INDIVIDUAL LEARNING PATHWAYS IN LANGUAGE TRAINING FOR BACHELOR'S STUDENTS WITHIN ADAPTIVE DIGITAL DISTANCE LEARNING ENVIRONMENTS

Khodarieva Iryna
PhD, Associate Professor at the Department
of Ukrainian Philology and History
Simon Kuznets Kharkiv National University of Economics
Kharkiv, Ukraine

Abstract: The article substantiates a methodological model of adaptive digital environments for the language training of Bachelor's students majoring in IT under conditions of distance and blended learning. The structure of adaptive digital environments, which combines cognitive, activity-based, and technological components, is defined. Furthermore, a four-stage content adaptation algorithm is described, aimed at increasing the efficiency of professional communication and preventing cognitive overload of the learner.

Keywords: Adaptive digital environments, methodological model, distance learning, blended learning, personal learning environments.

Today, the educational system is undergoing a profound transformation driven by the rapid development of digital technologies, their penetration into all spheres of social life, and the growing importance of distance and blended learning. Global challenges of our time (pandemics, security crises, the war in Ukraine) have turned the digitalization of higher education from an innovative trend into a fundamental condition for its viability and competitiveness.

The use of digital tools in the humanities, particularly in teaching language

disciplines, is becoming of particular relevance. Traditional teaching methods based on the reproductive acquisition of knowledge increasingly fail to meet the needs of today's learners, whose cognitive styles have shifted. In other words, students have already adapted to interactive, visualized, and personalized content. Crucially, digital tools erase geographical and physical barriers, enabling higher education students to study continuously from anywhere in the world.

Consequently, there is a need to path rethink approaches to teaching language disciplines (as traditional ones prove to be insufficiently effective) by utilizing innovative educational technologies, including multimedia platforms, personal learning systems, and artificial intelligence tools. A key scientific task is to evaluate the effectiveness of such technologies and to investigate their impact on the development of students' language competence.

A review of contemporary scholarly literature demonstrates the high significance and multidimensional nature of implementing ADEs (adaptive digital environments) into the language training of Bachelor's students during distance and blended learning. This transformation of higher education is driven by the demands of the knowledge economy and encompasses both the theoretical and methodological aspects of digitalization, as well as the practical mechanisms of its implementation. The foundational concepts of establishing a digital educational space and transforming open scientific and educational environments are thoroughly reflected in the works of such domestic researchers as V. Bykov, S. Semerikov, M. Shyshkina, M. Popel, O. Pinchuk, O. Lytovchenko, L. Kondratova, and I. Polyashchenko [1–4].

A distinct vector of scientific inquiry focuses on the comprehensive study of modernizing professional training, where digital technologies serve as a key factor in improving educational quality and fostering the competencies of future specialists (as investigated by T. Samus, A. Herevenko, I. Ostrovska-Buhaychuk [5] and O. Sysoiev [6]).

At the same time, the theoretical substantiation of methodological techniques, cutting-edge tools, and concepts for teaching language disciplines under conditions of integrating pedagogical and information technologies has been thoroughly developed

in the works of a wide range of domestic (O. Horoshkina, T. Hruba, Yu. Tryus, O. Semenoh, O. Semenikhina, D. Bezuhlyi) and foreign scholars (D. Stillman, R. Gordon, St. Frycie, M. Jurkowski, K. Sicińska, Lisa A. Rumisek, Karen P. Macbeth) [7–14].

According to researchers, the implementation of adaptive learning technologies fosters the development of not only subject-specific but also professional competencies, particularly "the capacity for self-directed learning, critical thinking, reflection, and flexible adaptation to professional challenges. This allows for viewing adaptive learning as an effective tool for training competitive specialists capable of continuous professional development in a dynamic labor market" [15, p. 16].

In our previous studies, we presented a tool for intensifying the learning of scientific language – our proprietary models of academic discourse based on a synthesis of rhetorical strategy and linguistic engineering, along with the necessity of moving away from unified training in favor of individual educational pathways in language preparation. Learners are enabled "not only to adhere to linguistic norms but also to consciously manage the reader's attention, construct the logical integrity of the text, and effectively counter-argue within the framework of scientific dialogue. The application of this methodology contributes to the formation of a scientist's holistic linguistic personality, capable of communicating at an international level" [16, p. 376].

Thus, the analysis of scholarly sources demonstrates the existence of a significant theoretical and practical foundation for researching adaptive technologies within the system of language training for Bachelor's students under conditions of distance and blended learning.

The purpose of the proposed study is to theoretically substantiate and develop a holistic methodological model of adaptive digital environments (ADEs) for the language training of Bachelor's students majoring in IT under conditions of distance and blended learning, aimed at enhancing the efficiency of professional communication and preventing students' cognitive overload. To achieve this goal, it is necessary to fulfill the following tasks: a) to define the specifics and didactic

potential of ADEs in the process of language training for future information technology specialists; b) to substantiate, design, and analyze the architecture of a comprehensive model for adaptive learning and language training of IT undergraduates in distance and blended education formats.

In the context of the modern higher education paradigm, the ADE for the language training of Bachelor's students majoring in IT is viewed not merely as a collection of technological tools, but as a complex, dynamic, student-centered ecosystem. Its essence lies in the integration of the didactic capabilities of information and communication technologies with the psychological and pedagogical principles of mastering an academic discipline. The key distinction between an ADE and traditional learning management systems (LMS) is its ability to respond flexibly to the individual requests, preferences, baseline knowledge level, and cognitive characteristics of each learner by automatically modifying the learning pathway, pacing of material delivery, and task complexity in real time.

The effective functioning of the ADE in distance and blended learning environments represents a stable interrelation of three baseline components: *cognitive, activity-based, and technological*.

The *cognitive component* is focused on the internal processes of information perception, taking into account the specifics of the IT specialist's algorithmic and systemic thinking, their individual learning pace, and their level of language competence. It encompasses: the specific nature of students' professional thinking (the predominance of abstract-logical, algorithmic, and systemic thinking styles); learning profiles, the individual pace of material acquisition, and the current level of language competence development; it also regulates cognitive load, preventing overload caused by the excessive complexity of tasks.

The *activity-based component* is responsible for the practical implementation of the individual educational pathway through adapted micro-tasks. It transforms theory into skills by means of contextual learning (authentic IT case studies, testing), interactive language practices (project work, simulation of communication with clients, job interview preparation), and mechanisms for flexible task selection (e.g.,

reinforcing professional communication skills for passing an IT interview) to adjust the learning focus.

The *technological component* serves as the hardware, software, and algorithmic platform that integrates the previous elements into a unified functional system. It includes AI and machine learning tools for data analysis and performance forecasting, adaptive learning algorithms for selecting personalized content, as well as interface solutions (chats, automated error-checking modules) for distance and blended interaction.

Consequently, the synergetic effect of the interaction among these defined components allows the ADE to function as an open, self-organizing system. The cognitive component sets the vectors of individualization, the activity-based component fills the language training process with professionally significant content, and the technological component ensures automated flexibility, adaptivity, and continuous monitoring of results.

The continuous and cyclical adaptation of the digital learning environment is characterized by four sequential stages locked into a Continuous Refinement Loop:

Node 1: ADE Setup & Baseline – The system captures the initial state, conducts a baseline assessment of the learner, and defines target metrics for further progression tracking.

Node 2: Adaptive Path Generation – Based on analytics, AI algorithms automatically generate a personalized learning pathway, select optimal content modules, and define suitable activity formats.

Node 3: Process Execution & Adaptation – The direct phase of instruction delivery, integrating adaptive activities and providing real-time feedback, hints, and support tailored to student responses.

Node 4: Performance Analysis & Cycle – This phase focuses on monitoring skill development, analyzing student progress, and generating performance reports. The data obtained feeds directly back into the system loop, ensuring the continuous refinement of the student's profile.

The organization of language training for future IT specialists in distance and

blended learning environments is based on a hybrid model that flexibly combines synchronous (real-time interaction) and asynchronous (autonomous work within the ADE) formats. Since future IT specialists are oriented toward practical utility and time resource optimization, the traditional lecture-and-seminar system is replaced by a hybrid model where each format performs its specific didactic function. This allows for freeing up live classroom time for active language practice, discussions, interactive activities, and the socialization of learners who experience verbal communication barriers.

The technological foundation of this model comprises video conferencing services (Zoom, Google Meet, Skype), the effectiveness of which is enhanced by interactive tools such as virtual whiteboards and polling systems, thereby contributing to the intensification of the audience's cognitive activity. The use of cloud technologies guarantees continuous access to resources and allows students to flexibly regulate their learning pace. In crisis conditions, it is precisely this digital format that ensures the stability, continuity of education, and preservation of full-fledged interaction between the instructor and students.

Research results indicate that the majority of educational process stakeholders (both instructors and students) positively evaluate the adaptability of the distance learning model. A high level of autonomy in planning and self-organizing academic activities not only contributes to creating a comfortable learning environment but also provides the necessary flexibility for implementing individual educational pathways [17].

The active use of personal learning environments (PLEs) is currently a highly relevant and sought-after learning tool. The application of PLEs is based on a combination of face-to-face and distance formats, driven by higher education institutions transitioning to blended learning, where learners simultaneously engage across online and offline platforms during classes. The core idea behind implementing our own practical experience lies in utilizing PLEs to enhance the quality of education by enriching the educational environment, ensuring equal access for all participants to quality learning and methodological materials regardless of

their place of residence or mode of study, and establishing proper conditions for learning personalization through the use of information and communication technologies.

PLEs are an essential tool in modern education, based on adaptive and personalized approaches. They are aimed at increasing learning efficiency, motivation, and learner engagement through well-designed individual learning plans, the integration of AI, and gamification.

The need to create such content is further justified by the fact that utilizing the PLE platform enhances interdisciplinary links between teaching philological disciplines and specialized courses, as it stimulates learners' need to search for reference and information materials within existing search engines, virtual libraries, etc. Consequently, student activity on the platform contributes to the development of professional competencies.

One of the greatest barriers in language learning is the fear of making a mistake in front of the audience or the instructor. Within an adaptive environment, this factor is minimized. The student interacts with the intelligent algorithm one-on-one. The absence of public judgment or comparison with other students in the group creates a safe digital space for experimenting with language material.

The uniform learning pace typical of the traditional educational system leads to two negative consequences: psychological overload for less prepared students and a loss of motivation (boredom) among stronger ones. Adaptability resolves this dilemma as well: the opportunity to independently manage the time spent on studying complex topics allows IT undergraduates to integrate language training into their demanding schedules, which often include working on real commercial projects or freelancing.

The combination of synchronous and asynchronous learning formats operates on the flipped classroom principle: all reproductive and analytical work with language material is shifted to the asynchronous adaptive environment, while synchronous sessions accumulate students' creative, productive, and communicative activities. This allows for optimizing classroom time and ensuring the high

professional relevance of language training.

Thanks to the intelligent algorithms of the ADE, the student receives tasks in segments that match their current cognitive resource. Automated training tools, interactive tests, and exercises for reinforcing language norms are performed at the user's convenience, which minimizes the stress factor.

Thus, adaptability increases the effectiveness of language training not through a mechanical increase in information volume, but by creating an optimal psycho-ecological environment. By eliminating didactic and emotional pressure, the ADE releases the internal cognitive resource of the IT undergraduate, converting it into sustainable language competence.

Despite its high didactic efficiency, the integration of the ADE into the language training system for IT undergraduates involves a number of significant challenges and limitations. The practical implementation of such a model in distance and blended learning environments encounters technical, pedagogical, and socio-economic barriers that require a systemic solution. First, under force majeure circumstances, both asynchronous and, even more so, synchronous learning formats are interrupted, which disrupts the integrity of the adaptive algorithm. Second, the instructor virtually loses the function of being the sole source of knowledge and evaluator. This demands highly developed soft skills, psychological flexibility, and the ability to design complex communicative case studies instead of mechanically grading homework assignments.

The implementation of the ADE in the language training system for IT undergraduates demonstrates a significant increase in both qualitative and quantitative indicators of their academic performance. The main reason for the high efficiency of the adaptive approach lies in the optimization of the student's internal psycho-emotional and cognitive processes, which are typically blocked under the conditions of traditional linear learning.

Thus, the integration of the ADE into the language training of undergraduates is not merely a technological requirement but a necessary condition for transitioning from mass, standardized instruction to creating flexible individual educational

pathways. This ensures maximum efficiency in the development of language and speech competencies within the rapidly changing environments of distance and blended learning.

REFERENCES

1. Биков В.Ю. Цифрова трансформація суспільства і розвиток комп'ютерно-технологічної платформи освіти і науки України. *Педагогіка і психологія*. 2019. № 2 (103). С. 15–21.

2. Семеріков С.О. Мобільне навчання: історія, теорія, методика. *Інформатика та інформаційні технології в навчальних закладах*. 2008. № 6. С. 72–82.

3. Шишкіна, М.П., Попель, М.В. Хмаро орієнтоване освітнє середовище навчального закладу: сучасний стан і перспективи розвитку досліджень. *Інформаційні технології і засоби навчання*. 2013. 37 (вип. 5). С. 66–80.

4. Пінчук О.П., Кондратова Л.Г., Литовченко О.В., Полященко І.М. Вітчизняний і міжнародний досвід використання веборієнтованих автоматизованих систем інформаційних систем в освітньому процесі. *Інноваційна педагогіка*. № 77. 2024. URL: https://lib.iitta.gov.ua/id/eprint/744272/

5. Самусь Т.В., Геревенко А.М., Островська-Бугайчук І.М. Вплив сучасних освітніх технологій на підготовку фахівців у професійній освіті України. *Педагогічна академія*: наукові записки. 2024. № 13. DOI: https://doi.org/10.5281/zenodo.14561853.

6. Сисоєв О. Професійна підготовка фахівців для економічної галузі як об'єкт наукового дослідження в Україні. *Неперервна професійна освіта: теорія і практика (серія: педагогічні науки)*. 2020. № 2 (63). С. 19–24.

7. Dorothy E Zemach, Lisa A Rumisek. Academic writing: from paragraph to essay. Oxford, U.K.: Macmillan Education. 2017.

8. Gajda S. Styl naukowy. *Współczesny język polski*. Wrocław. 1993. P. 17-190.

9. Jurkowski M. Kultura języka w nauce i technice // Frycie St., Jurkowski M., Sicińska K. Kultura języka polskiego. Warszawa. 2005. P. 184–198.

10. Karen P. Macbeth. Deliberate false provisions: The use and usefulness of models in learning academic writing. *Journal of Second Language Writing*. 2010. P. 33–48.

11. Stillman D., Gordon R. French Vocabulary Drills. New York: McGraw Hill Professional. 2014.

12. Горошкіна О., Груба Т. Українська наукова мова: теорія і практика: навч.-метод. посіб. Суми: Університетська книга. 2023.

13. Триус Ю.В. Комбіноване навчання як інноваційна освітня технологія у вищій школі. *Теорія та методика електронного навчання*: збірник наукових праць. Випуск ІІІ. Кривий Ріг. 2012.

14. Семеног О.М., Семеніхіна О.В., Безуглий Д.С. Формування академічної культури педагога-дослідника в умовах цифрового творчого середовища. *Інформаційні технології і засоби навчання*. 2017. Т. 62. № 6. С. 240–251.

15. Соболєва С.М., Скоробогатська О.І., Ходарєва І.М. Адаптивні технології навчання в підготовці фахівців для нової економіки знань в Україні. Педагогічна Академія: наукові записки, (30). 2026. URL: https://doi.org/10.5281/zenodo.20091857.

16. Черемська О.С., Ходарєва І.М. Моделювання академічного дискурсу як інструмент інтенсифікації навчання наукової мови. *Лінгвістичні дослідження*: зб. наук. пр. Харків, 2026. Вип. 64. С. 366–379.

17. Ходарєва І. Із досвіду викладання мовних дисциплін із застосуванням персональних навчальних систем в умовах дистанційного та змішаного навчання. *Освіта без кордонів: глобальні тренди у викладанні мов*: зб. тез доп. Міжнар. наук.-практ. конф. (23 жовт. 2025 р.). Харків, 2025. С. 143–145.