

The Significance of Personality-Oriented Technology in Higher Education in Ukraine

Olha Dienichieva, Iryna Biliak, Natalia Plakhotniuk, Tetiana Verhun and Kateryna Parnus

*State University "Zhytomyr Polytechnic", Chudnivska Str. 103, 10005 Zhytomyr, Ukraine
{olhadienichieva, nat.pl2002, katemarchuk38}@gmail.com, {kim_vtm, ktpl_biv}@ztu.edu.ua*

Keywords: Personality-Oriented Technologies, Self-Directed Learning, Responsive Learning Environment, Lifelong Education.

Abstract: This paper addresses the growing significance of personality-oriented technologies in higher education, particularly in times of crisis such as martial law in Ukraine. The research focuses on analyzing the application of digital tools, adaptive learning platforms, and AI-based educational resources to enhance individualized learning processes and support student engagement. The main aim of the study is to assess the impact of these technologies on students' motivation, academic outcomes, and adaptability during challenging periods. A mixed-methods approach was employed, combining quantitative and qualitative methods, including the analysis of survey data collected from 300 first-year students at Zhytomyr Polytechnic State University. The results show that while students widely utilize digital content and interactive platforms, the application of adaptive learning technologies and AI-driven tools remains limited. Students prefer independent learning modes and show moderate interest in mental health support services. The findings underline that the integration of personality-oriented technologies can significantly enhance learning efficiency, motivation, and self-directed learning skills. However, the implementation faces challenges related to limited engagement with adaptive tools and varying levels of digital literacy. The practical relevance of the study lies in offering pathways for educational institutions to better align digital solutions with diverse student needs. The theoretical contribution includes expanding the understanding of how personality-oriented technologies function in crisis-affected higher education environments and how they can be optimized for future resilience.

1 INTRODUCTION

The use of personality-oriented technology in education has gained considerable significance due to its ability to address the students' individual learning needs. Personality-oriented technology encompasses a range of pedagogical forms and methods, and digital tools, including adaptive software and artificial intelligence (AI) designed to develop and enhance individualized learning strategies and techniques. Pedagogical technologies are designed to modernise the content of educational material, considering varying pace of information processing and individual abilities and students' professional orientation, thereby fostering a more individualized approach to learning. Personality-oriented technologies enhance motivation and contribute to more effective educational outcomes by focusing on the development of students' professional competences and identifying areas for self-development and self-improvement [1; 2; 3]. They

have become especially acute when access to education is significantly restricted. For instance, following the military invasion in Ukraine, educational institutions were compelled to transition to distance learning using various digital educational platforms (e.g. Zoom, Google Meet, etc.), which had a significant impact on the students' intrinsic motivation to learn [4].

Conventional pedagogical methods, which rely on face-to-face communication have frequently proven inadequate during times of various crises. Personality-oriented technologies offer a solution by providing flexible, adaptable and accessible learning options to alleviate stress during educational process. Among the options that support lifelong learning, there are mobile learning applications and adaptive educational platforms individuals can use in challenging circumstances [5]. Modern technologies enhance learning outcomes, allowing students to progress at their own pace at the same time receiving professional support, consequently mitigating the

impact on their educational experience [6]. Thus, personality-oriented technologies reflect societal trends to provide an opportunity to build a robust education system.

The role of modern technologies in education has shifted from delivering general information to providing personalised content, considering the processes of individualization and differentiation. The implementation of personality-oriented technology in education enables the identification of students' interests and abilities, for the purpose of fostering professional development of future specialists. Under these conditions, teachers are able to create a favourable educational environment by utilizing technological tools to stimulate external and internal factors that promote engagement in educational activities.

Philosophical and pedagogical frameworks emphasize the importance of recognizing the holistic nature learners: encompassing their mind, emotions, and personality. Traditionally, the tendency to adopt a one-size-fits-all approach to personality development may overlook the diverse ways in which individuals process information. The content of modern human development concepts in society does not restrict the use of individualized methods to unlock students' potential. Drawing on psychology and cognitive sciences to support professional development, the individualization and differentiation of the educational process aim to provide a wide range of task types for the professional development of the individual.

The particular importance of the studies of international scholars such as Dora Y. Kovrei, a representative of the Transylvanian Hungarian College in Berehove, who collaborates with Ukrainian researchers in the implementation of personality-centered strategies in Eastern Europe. Her work reflects the broader international interest in this issue, evidenced by France's national policy of learning individualization since 1989. Meta-analyses confirm the influence of personality traits on academic performance, while research from Asia demonstrates the effectiveness of using machine learning algorithms to personalize education.

Innovative technologies such as artificial intelligence, adaptive learning platforms, and interactive digital tools have enabled educators to put personality-oriented education into practice. These technologies can identify students' learning patterns, adapt content to their individual development, and offer personalized feedback, thereby transforming the teaching and learning process.

2 RESEARCH GOALS

The purpose of the study is to analyse the role of personality-oriented technologies in higher education, highlighting the importance of using digital tools to provide students with pedagogical support and maintain their motivation to education during challenging times. The research focuses on analyzing the characteristics of personality-oriented technology and identifying the challenges of its implementation in the educational process during challenging times. The objectives of the research are to explore the impact of personality-oriented technology implementation on the student engagement and assess the students' adaptability to the use of learning technologies in education. The practical significance of the research lies in identifying the ways to adapt educational practices to foster responsive learning environment.

3 RESEARCH METHODOLOGY

The following methods were employed in the research: analysis, synthesis, and generalisation to explore the issue of personality-oriented technology in education; analysis of the students' surveys, observation and systematisation to identify the relationships between learning goals, educational needs and learning outcomes during times of crisis.

To ensure the reliability and clarity of the survey, a pilot test was conducted with a sample group of students. Based on their feedback, ambiguous items were refined. The final version was reviewed by academic experts to ensure alignment with research objectives and internal consistency of the tool.

Methodology. The term "technology" is derived from Greek words that comprises two words: "technē" and "logos". The concept of technology in education is understood as a means to integrate various processes, techniques, methods to create favourable conditions for the individual development, address their individual educational needs and determine their learning objectives [7]. The following pedagogical technology should be highlighted as personality-oriented technology. This technology aims to develop the student's potential, enhance their skills and abilities, and provide professional experience.

It is essential to examine personality-oriented technology in the context of a crisis from three perspectives: social, educational, and psychological. In the social aspect, the technology is used to assess

the educational needs of an individual in response to specific life situations, and to study the impact of social, political, and economic factors on personal development during a crisis. In the field of education, the use of personality-oriented technology ensures an individualised approach to learning. Considerable attention is given to the organization of the educational process in alignment with the analysis of labour market requirements, differentiation and individualization of learning. In the psychological field, significant emphasis is placed on the development of the student's individual potential, cognitive skills, psychological and pedagogical support in stressful situations and during rehabilitation after such experiences.

Personality-oriented technologies encompass a broad range of digital tools and methods designed to address the learners' educational needs. The implementation of this technology is grounded in three core principles: mobility, responsiveness, and learner-centered design [8; 9; 5; 2]:

Mobility refers to the ability of educational technology to provide multiple ways of learning, allowing students to access information in a way that suits their individual circumstances, schedule and learning environments. For instance, personality-oriented technologies facilitate asynchronous learning, where participants can work with resources at their own pace.

Responsiveness is another fundamental principle that emphasizes the need for educational tools to adapt content and teaching strategies according to real-time feedback from learners, while considering the environments in which they are learning. This dynamic approach ensures that learners receive appropriate support and guidance to foster their educational development.

The principle of Learner-centered design emphasizes the importance of tailoring the educational experience to each individual learner, considering their unique experiences, interests and learning styles. By prioritizing the needs of the learner, personality-oriented technologies foster an inclusive learning environment that enhances engagement and motivation.

The implementation of personality-oriented technologies in the educational process aims to enhance the effectiveness of students' learning. It is viewed as a means to develop students' critical thinking abilities, foster their learning habits and cultivate the ability to adjust everyday activities in stressful situations. The realisation of the educational process through educational platforms and the use of digital tools to provide personalised content enhances

the accessibility of resources tailored to individual students' needs. This not only enhances the relevance of content, modernises educational programmes and updates curriculum, but also increases student internal motivation. For example, during martial law in Ukraine, educational platforms introduced the personalised content to address the educational challenges faced by displaced students, offering them learning resources to support their academic continuity.

The integration of Information and Communication Technologies (ICT) in learning process enhances language skills development while fostering critical thinking, creativity, self-expression, and personal growth. Additionally, leveraging tools such as YouTube, mind maps, and educational blogs enables students to unlock their academic potential, access up-to-date professional information, and engage in collaborative learning and communication [10].

It is important to emphasise that the use of innovative pedagogical technologies and digital tools, which allow students to gain professional and practical experience in challenging social conditions is aimed at the formation of personal values that are essential for their self-development. Personality-oriented technology focuses on creating favourable conditions for the realisation of creative skills. The primary objective of this technology is to facilitate the psychological adaptation to learning by enabling the mastery of professional training [11; 12].

Another important aspect of personality-oriented technology is the availability of communication. This means that learning platforms facilitate teacher-student interaction, instant assessment of completed tasks allowing for timely correction of written work and adherence to deadlines. This immediate feedback fosters intrinsic motivation to study and encourages students to take responsibility for their education [13; 14].

In addition, with the development of artificial intelligence technologies, the implementation of personality-oriented technology also implies providing personalised learning support, which reinforces the concept of adopting a personality-oriented approach to modernise the content of educational programmes to update the curriculum to enhance students' interest in education in time of crisis. Researchers recognize the potential of such technologies, emphasising that they contribute to improving student learning outcomes when traditional teaching methods and technologies may prove ineffective during times of crisis.

4 RESULTS

To understand the complex nature of personality-oriented technology applications in the educational process, a mixed-methods approach was employed: combining both quantitative and qualitative methods to collect and analyze the results of students' surveys to assess the effectiveness and potential of the implemented technologies. A structured survey was developed, consisting of three sections and 35 questions: the first section 'Frequency of Technology Use' (Table 1), focuses on the frequency of technology use in studying; the second section, 'Types of Personality-Oriented Technologies Applied' (Table 2), and the third section 'Impact on Learning Outcomes' (Table 3), examined the influence of digital tools on students' motivation and learning outcomes. A total of 300 survey respondents, including first-year university students from various disciplines at Zhytomyr Polytechnic State University, were informed about the purpose of the research. The first-year university students of various disciplines at Zhytomyr Polytechnic State University were informed about the purpose of the research. The survey was distributed via email and was conducted anonymously and confidentially.

The use of modern pedagogical technologies and digital resources modernizes the educational process, updates the curriculum content, and creates engaging learning environment where students can learn through interactive exercises and real-life communication situations. It is important to note that digital tools and online resources are widely integrated into the educational process (Table 1). It is emphasized that digital tools such as apps, educational videos and interactive technologies are extensively used, indicating the availability and relevance of these resources.

As a result, students demonstrate a moderate interest in adaptive and individualized learning features, with a clear preference for interactive content and some inclination toward gamification. However, their engagement with AI-based tools and social platforms remains limited (Table 2). The findings further indicate that while students recognize the advantages of digital and interactive content, the adoption of adaptive learning technologies and AI-driven educational tools, such as AI-powered

language learning applications (e.g., Duolingo, WordUp, Learn English Grammar) and automated writing assistants (e.g., Grammarly), is not widespread. Independent learning is generally preferred over collaborative methods, such as peer-assisted learning, group discussions, and project-based learning. Moreover, mental health tools and adaptability in learning receive only moderate to low prioritization.

Table 1: Frequency of technology usage in students' learning process.

| Survey issues | Results and outcomes |
|--|--|
| Usage of devices: | The vast majority (97.7%) of students use digital devices for learning on a daily basis. |
| Access to academic online resources: | Most participants frequently access online resources: 63.6% use them weekly and 22.7% use them daily. |
| Use of educational applications: | Educational applications are used moderately: 13.6% of students use them frequently, 34.1% use them from time to time, and 29.5% never use them. |
| Digital technologies for note-taking/memorization/lecturing: | The use of digital notes is balanced: 31.8% of students take notes often or sometimes, and 29.5% rarely. |
| Interaction with learning groups/communities: | Involvement is varied: 31.8% of students participate daily, 15.9% engage weekly, and 34.1% rarely. |
| Making use of digital tools to increase efficiency: | Only a minority (11.4%) of respondents use productivity tools very often, 27.3% use them rarely, and 18.2% never. |
| Educational content: | Most students watch educational videos: 38.6% rarely, but 25% sometimes and 20.5% often. |
| Self-assessment technology: | The level of regular self-assessment is weak: 45.5% of participants rarely take tools such as tests, while 9.1% of students use them frequently. |
| Online learning/support/consultation: | Online learning/support/consultation is used infrequently: 45.5% of students rarely use it and only 9.1% of them often. |

Table 2: Application of personality-oriented educational technologies.

| Survey issues | Results and analyses |
|--|--|
| 1. Use of Learning Platforms | Usage varies, with 22.2% of students using the tools frequently, 25% occasionally, and 38.9% rarely, indicating some interest, but limited widespread use. |
| 2. Digital Content | Interactive content is the most preferred (44.4%), followed by visual content (16.7%) and text-based content (11.1%), highlighting a clear reference for interactivity. |
| 3. AI-based Educational Tools | Only 13.9% of students use AI tools regularly, while half use them rarely, indicating limited application of AI in educational contexts. |
| 4. Digital Individual Assessments | The use of personality assessments is low, with 8.3% of participants using them frequently and 38.9% using them rarely. This reflects a limited level of engagement with these tools. |
| 5. Prioritizing adaptive educational resources | Most students are neutral (58.3%) regarding adaptive tools, while 16.7% strongly agree. The results indicate limited enthusiasm for the use of adaptive tools. |
| 6. Individualization in the educational environment | Individuals show a slight preference for customization, with 25% strongly agreeing and 47.2% agreeing on its importance. |
| 7. Use of Online Platforms | The research reveals a low level of participation, with 30.6% of respondents never using online platforms for community engagement, and only 8.3% using them daily, indicating that such platforms are not a top priority. |
| 8. Use of Gamified learning resources | The usage of gamification is limited, with 11.1% of participants using it frequently, and 27.8% never using them, suggesting that gamification is not a widely preferred approach. |
| 9. Key features of educational tools | Social sharing (25%) and usage (22.2%) are the most valued, while adaptive learning holds less importance (8.3%). Social communication emerges as a key factor. |
| 10. Educational Recommendations | 16.7% strongly agree, 36.1% agree that recommendations are useful, while 41.7% remain neutral. The responses are divided with substantial proportion of neutral opinions. |
| 11. Personality-Oriented Learning Methods | Independent learning is preferred by 38.9% of respondents, followed by collaborative tasks at 16.7%. This indicates a stronger preference for autonomy in learning. |
| 12. Immediate Feedback Resources | 19.4% of students frequently use feedback, but 50% never utilize them. This indicates that although some participants value feedback tools, it is generally underutilized. |
| 13. Focus on Mental Health Tools | The responses vary: 16.7% strongly agree, the majority remain neutral (52.8%). Although mental health tools are of notable concern, they are not considered a top priority. |
| 14. Significance of responsiveness | 8.3% of respondents consider adaptability to strengths and weaknesses to be very important, while 41.7% remain neutral. This suggests that flexibility is not a strong priority. |
| 15. Use of Self-Reflection and Self-Assessment Tools | 38,9 % of participants sometimes use learning technologies that encourage self-assessment tools, 25 % rarely use them, 19,4 % never use self-reflection tools and only 8,3 % of students frequently use these tools. |

According to the survey, personality-oriented technologies enhance learning efficiency, however; a certain percentage of respondents still view them as merely useful (Table 3). A significant number of students maintain a neutral attitude towards these technologies, focusing on their overall effectiveness and primary outcomes in training.

It is important to highlight that a significant portion (46.9%) of students agreed that technology helps them understand complex topics (Table 3). At the same time half of the respondents suggested that the role of technology in a detailed examination of complex material may vary depending on the type of

technology or individual learning style/pace. Alongside, 53.1% reported that technology had a positive impact on their motivation, half of the respondents reported a contradictory response. The discrepancy observed in the middle of the survey suggests that the use of personality-oriented technologies enhances students' motivation to acquire new knowledge, while other half may not view the use of technologies as significant factor influencing the motivation level. Most students agreed that digital technologies aid in time management, with 34.4% reporting a significant effect (Table 3).

Table 3: Effectiveness of digital technologies on student learning.

| Survey Issues | Results % |
|---|---|
| Impact of Technology Use on Learning Efficiency | Significantly improved: 18,8% Slightly improved: 25% Neutral: 56,3% |
| Deepening comprehension of complex topics | Agreed: 46,9% Neutral: 53,1% |
| Information Storage | Often: 56,2 % Sometimes: 43,8% |
| Motivation to Education | Increased: 52% Neutral: 48% Decreased:0% |
| Ability to carry out evaluations | Improved: 41,8% Slightly improved: 37% No change: 21,2% |
| Managing time while studying | Significantly: 28,1% A little: 37,5% No impact: 34,4% |
| The impact of digital education on academic performance | Agree: 57,3% Neutral: 37,5% Disagree:5,2% |
| Reducing academic stress with technology | Frequently: 31,3% Sometimes: 34,4% Rarely: 25% Never: 9,3 % |
| Keep focused and organized | Agree: 25% Neutral: 46,9% Disagree: 28,1% |
| Improvement in learning outcomes | Improved: 51,5% Slightly improved; 42,4 % No impact: 6,1% |

This suggests an ambiguous response to whether digital technologies consistently facilitate time management during training. More than half of the participants believe that personality-oriented technologies, innovative teaching methods and digital tools contribute to academic success, while a significant portion of the respondents remain neutral (Table 3). Many students report that stress reduction is achieved through a combination of various content technologies, methods, and techniques designed to mitigate its effects. It is noted that some of the students either agreed or remained neutral regarding the influence of technology on attention and the organization of the educational process. This result may suggest that the technologies provide some organizational tools for effective learning, but their impact is individualized.

5 CONCLUSIONS

Personality-oriented technology has proven to be a transformative approach in modern education, particularly during crises such as martial law in Ukraine. By integrating adaptive learning platforms (e.g., Canvas Network, Coursera, UA EduHub), AI, and interactive tools (e.g., Kahoot!, Quizlet, Google Classroom, Duolingo, BBC Learning English), this approach addresses individual learning needs and promotes flexibility, motivation, and skill development.

Survey data confirm high engagement with digital resources: according to Table 1, 97.7% of students use digital devices daily, and over 85% regularly access academic content. Table 2 highlights a strong preference for interactive materials (44.4%) and independent learning (38.9%), while use of AI tools (13.9%) and gamified resources (11.1%) remains limited. Table 3 supports the positive impact of these tools on efficiency, comprehension, and motivation, though student responses vary, reflecting diverse learning preferences.

Despite the benefits, challenges persist, including low engagement with adaptive tools, online collaboration, and mental health resources. Further refinement is needed to align these technologies with students' needs. Initiatives such as adaptive platforms (e.g., EdEra, Prometheus) have proven effective in supporting displaced students during wartime, illustrating the resilience of personality-oriented technologies. To maximize their impact, institutions must invest in teacher training, advanced tools, and curriculum integration, ensuring a more adaptive and inclusive learning environment. These adaptive strategies provide concrete pathways for shaping a responsive educational environment aligned with students' psychological, professional, and emotional development. Educational practices can be adapted by embedding flexible learning trajectories, providing real-time personalized feedback, and ensuring that instructional content evolves dynamically with learners' progress and contexts.

REFERENCES

- [1] R. Jayadurga and S. Rathika, "Significance and Impact of Artificial Intelligence and Immersive Technologies in the field of Education," *International Journal of Recent Technology and Engineering (IJRTE)*, vol. 12, pp. 66-71, 2023, [Online]. Available: <https://doi.org/10.35940/ijrte.B7802.0712223>.
- [2] S.K. Mangal and U. Mangal, *Essentials of Educational Technologies*. New Delhi: PHI Learning, 2009.

- [3] T. Bogachenko and R. Burke, "Educational 'exchange rates' in (re)settlement: The use of formal and informal learning resources by displaced people from Ukraine in Australia," *International Journal of Educational Research*, vol. 127, 102412, 2024, [Online]. Available: <https://doi.org/10.1016/j.ijer.2024.102412>.
- [4] IEA, "Education and Science of Ukraine under Martial Law," Kyiv, 2023, [Online]. Available: <https://mon.gov.ua/storage/app/media/zagalna%20serednya/serpnevakonferencia/2023/22.08.2023/informanalytic.zbirnosvita.v.umovah.voyennogo.stanuvykl.rozv.povoyen.perspekt.22.08.2023>.
- [5] M. Hrynova, *Personality-oriented Technology of Education and Upbringing*, 2015, [Online]. Available: <http://acup.poltava.ua/wp-content/uploads/2015/03/GrinovaM>.
- [6] O. Dienichieva, M. Komogorova, S. Lukianchuk, L. Teletska, and I. Yankovska, "From Reflection to Self-Assessment: Methods of Developing Critical Thinking in Students," *International Journal of Education and Information Technologies*, vol. 15, pp. 227-236, 2021, [Online]. Available: <http://doi.org/10.46300/9109.2021.15.23>.
- [7] R. A. Buchanan, "History of Technology," [Online]. Available: <https://www.britannica.com/technology/history-of-technology>.
- [8] D. Bekh, "Personality-Oriented Model of Education as a Scientific Construct," *Psychological and Pedagogical Problems of Rural School*, vol. 3, pp. 143-156, 2000, [Online]. Available: https://library.udpu.edu.ua/library_files/psuh_pedagog_prob_l_silsk_shkolu/3/vupysk_21.pdf.
- [9] K. Arar, A. Saiti, and M. Guajardo, "Redesigning and recomputing the future of education: The role of technology, the learning process, personality traits, and diversity in learning systems," *Power and Education*, vol. 15, no. 2, pp. 243-258, 2023, [Online]. Available: <https://doi.org/10.1177/17577438221117346>.
- [10] N. Plakhotniuk, O. Chernysh, and O. Makarevych, "The Use of ICT for the Development of Foreign Language Communicative Competence in Hospitality Industry Students," *Proceedings of International Conference on Applied Innovation in IT*, vol. 12, no. 1, pp. 41-50, 2024.
- [11] M. Borrego, "Innovation and ICTs in ESL: Exploring the Role of the Podcast as a Learning Enhancing Tool in Innovation Projects," *Integrated Journal for Research in Arts and Humanities*, vol. 3, no. 2, pp. 70-77, 2023, [Online]. Available: <https://doi.org/10.55544/ijrah.3.2.12>.
- [12] M. Xodjajeva, R. Kabulov, R. Djuraeva, D. Alimjon, and A. Mukhammadiev, "Personality-Oriented Learning Technologies," *International Journal of Recent Technology and Engineering (IJRTE)*, vol. 8, pp. 7706-7708, 2019, [Online]. Available: <https://doi.org/10.35940/ijrte.D5369.118419>.
- [13] R. Sajja, Y. Sermet, M. Cikmaz, D. Cwiertny, and I. Demir, "Artificial intelligence-enabled intelligent assistant for personalized and adaptive learning in higher education," *arXiv preprint arXiv:2309.10892*, 2023, [Online]. Available: <https://doi.org/10.48550/arXiv.2309.10892>.
- [14] C.-H. Tseng, H.-C. K. Lin, H. A. C.-W. Huang, and J.-R. Lin, "Personalized programming education: Using machine learning to boost learning performance based on students' personality traits," *arXiv preprint arXiv:2501.00825*, 2025, [Online]. Available: <https://doi.org/10.48550/arXiv.2501.00825>.