From the digital transformation strategy to the productive integration of technologies in education and training: Report 2023

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Abstract

This is an introductory text to a collection of selected papers from the International Workshop on Digital Transformation of Education (DigiTransfEd 2023), held in Ivano-Frankivs'k, Ukraine, on October 19, 2023. The volume presents the contributions to the workshops affiliated with the ICTERI 2023: the 18th International Conference on ICT in Education, Research, and Industrial Applications. The workshop covers topics such as digital transformation strategies for educational institutions, assessment and evaluation of digital learning environments, teacher training and professional development for digital transformation, open educational resources and open educational practices, data analytics and artificial intelligence in education, innovative technologies and tools for digital education, and adaptive learning, among others. The proceedings of the workshop include an introduction and 10 contributed papers that have been carefully peer-reviewed and selected from 26 submissions, presented by the authors during the workshop and painstakingly improved by them based on the results of the discussion.

Keywords

ICTERI 2023, Digital Transformation of Education, ICT in Technology Enhanced Learning, Tools for Technology Enhanced, Modelling Systems in Education

1. Theme of the Workshop

DigiTransfEd 2023 as DigiTransfEd is a peer-reviewed international workshop focusing on the theory and practice of Digital Transformation of Education. Digital transformation has changed the world, the society and the economy. However, until the COVID-19 pandemic, its

DigiTransfEd 2023: 2nd Workshop on Digital Transformation of Education, co-located with the 18th International Conference on ICT in Education, Research, and Industrial Applications (ICTERI 2023), September 18-23, 2023, Ivano-Frankivsk, Ukraine

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impact on education and training was much more limited. The pandemic has demonstrated that having an education and training system which is fit for the digital age is essential. The digitalization of education that occurred during the pandemic prepared all levels of education in Ukraine for work under war conditions. Digital transformation of the educational process of all levels, branches and directions of training is currently a key issue for research by all scientists in the world. Researchers, graduate students, scientists have been invited to participate in the workshop dedicated to the global problem of humanity. The theme of DigiTransfEd 2023 is related to the ICTERI 2023 Track 4: ICT in Education: Methodology and Didactics of Teaching and Using ICT / ICT in Technology Enhanced Learning and Instruction / Advances in and Tools for Technology Enhanced Learning / Modelling Systems in Education.

DigiTransfEd topics of interest include, but are not limited to, the following: digital transformation strategies for educational institutions, integrating digital technologies in teaching and learning, online and blended learning models for K-12 and higher education, assessment and evaluation of digital learning environments, student engagement and motivation in online learning, teacher training and professional development for digital transformation, ethical and social implications of digital transformation in education, open educational resources and open educational practices, gamification and game-based learning in digital education, data analytics and artificial intelligence in education, innovative technologies and tools for digital education, digital transformation and educational equity and inclusion, digital citizenship and digital literacy in education, personalized learning and adaptive learning technologies, collaboration and communication in digital learning environments, etc.

2. The Workshop Aims

The workshop is aimed at supporting the implementation of digital technologies and innovations, ensuring access to digital infrastructure and educational services, increasing the competitiveness of higher school graduates in the labour market, expanding the range of educational resources in the digital market, promoting the development of digital strategies, as well as improving cyber security for educational institutions.

Figure 1: The DigiTransfEd 2023 logo.

The focus of the discussion is: access to digital resources and educational materials, methods of using them to improve the quality of digital education, promoting the transfer of technologies developed in university laboratories, high-performance computing and artificial intelligence.

The organizers of the scientific event have had the following objectives:

- Identifying the most pressing challenges in the digital transformation of education, where coordinated research efforts from international teams are necessary.
- Analyzing the potential benefits of new teaching methods that involve extensive use of digital tools and teaching techniques, as well as collaborative research efforts.
- Informing educators about potential risks in the application of Information and Communication Technologies (ICT) in education.

3. Topics of Interest

Topics of Interest have been grouped into five areas:

DigiTransfEd 1: "Digital transformation strategies for educational institutions" comprises articles that deeply explore and analyze digital transformation strategies at educational institutions.

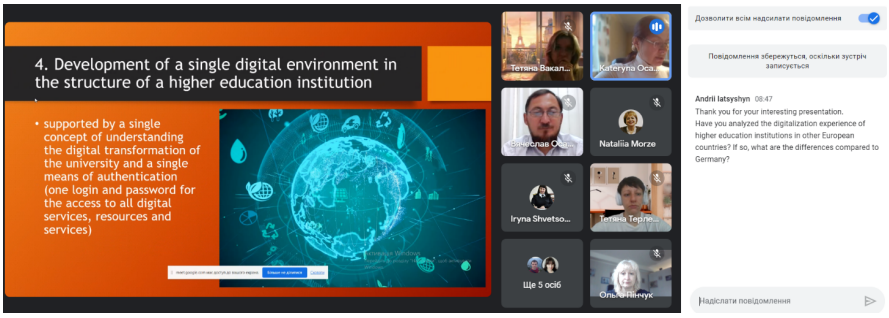

Figure 2: Screenshot during the report "Analysis of experience of digital transformation in education in Germany".

Based on the critical analysis of international experience, certain pathways for enhancing the digital transformation of national education systems and higher education institutions have been proposed. Innovations in the formation and improvement of the functioning and activities of universities have been explored. The level and scope of engagement of higher education institutions and research establishments in e-infrastructures have been examined, highlighting the role of e-infrastructures at higher education institutions and research establishments.

DigiTransfEd 2: "Teacher training and professional development for digital transformation. Collaboration and communication in digital learning environments" – the selection of papers in this workshop session provides a variety of topics and approaches, contributing to better understanding of research and practical experience in teacher training and professional development in the context of digital transformation.

Research on new methods and technologies in teacher training and professional development is aimed at enhancing their pedagogical practices.

Figure 3: Screenshot during the report "Theoretical exploration of university ecosystem design under conditions of digital transformation".

Research that explores effective ways to create and sustain interactivity and collaboration between teachers and students in digital learning environments, along with examples of successful practices in the implementation of digital tools in education that promote active student engagement.

DigiTransfEd 3: "Integrating digital technologies in teaching and learning" – reflects the scholarly interest of researchers in a wide range of initiatives, one of which involves the use of digital solutions in educational processes.

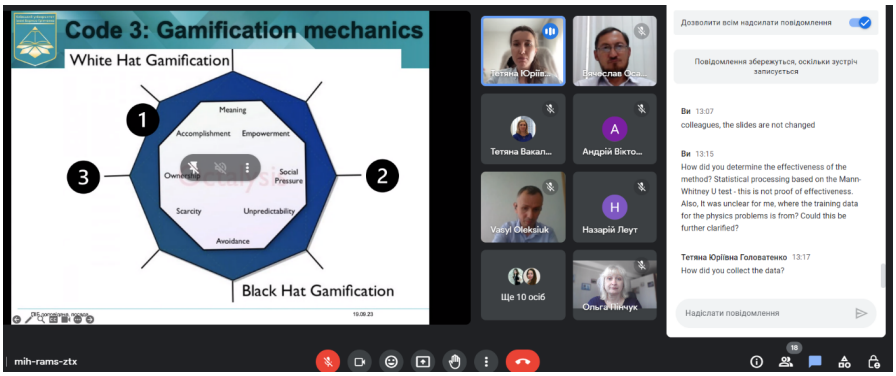

Figure 4: Screenshot during the report "Pre-service elementary school teacher perspectives on the use of digital gamification activities in language teaching".

The presentations showcase how artificial intelligence can become a powerful tool for teaching scientific subjects, opening up new opportunities for interactive and personalized learning. The experience of deploying a cloud-based educational environment at secondary schools demonstrates the growth of access to modern educational resources through cloud technologies. This marks a significant step towards improving access to education for all students, regardless of their place of residence.

Participants of the workshop have provided examples of how digital games can serve as powerful tools for stimulating student interest and activity. This has the potential to revolutionize the way we teach languages and other subjects.

The integration of digital technologies into teaching and the pedagogical process offers new

opportunities for engaging students, fostering cognitive activities, and enhancing the quality of education.

DigiTransfEd 4: "Student engagement and motivation in online learning" – this issue has become relevant in the context of using integrated educational courses, mobile applications for digital education, and the development of content for electronic educational courses according to the educational-professional program.

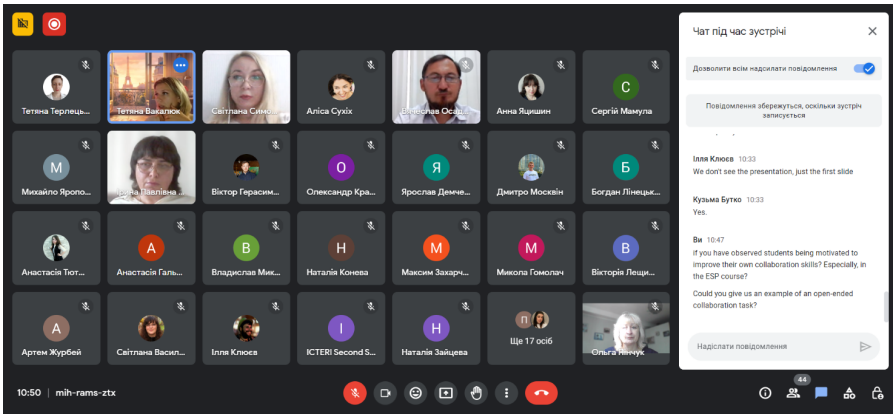

Figure 5: Screenshot: during the seminar participants' discussion of the problems of increasing students' motivation for distance learning.

Engaging and motivating students is a process that requires patience and creativity. It is important to understand that students have different learning styles and levels of motivation. Therefore, educational programs and courses should be adapted to various needs and learning styles, providing students with the opportunity to choose and control their own learning.

Mobility has become a key factor in the modern world, and students expect to have access to educational materials at any time from any device. Creating applications that enhance the convenience and accessibility of learning can significantly improve student engagement. Furthermore, mobile applications and VR simulators can introduce gamification elements into education, which enhances student motivation.

An effective online learning course should not only have a user-friendly interface but also high-quality content. Developing content that aligns with the educational-professional program helps students see the relevance of the materials and their applicability in their future professional activities.

DigiTransfEd 5: "Innovative technologies and tools for digital education" – organizers of the educational process, instructors, teachers, and trainers have unique opportunities in the realm of digital education to prepare a new generation of students for life in the digital world.

The development of the methodology for studying artificial intelligence holds significant importance for future educators. They need to understand how artificial intelligence functions, machine learning algorithms, and their applications in education. This helps teachers adapt their teaching and learning methods to contemporary technological realities and prepare students for work in a digital society.

The necessity for the digital transformation of student diploma projects is equally impor-

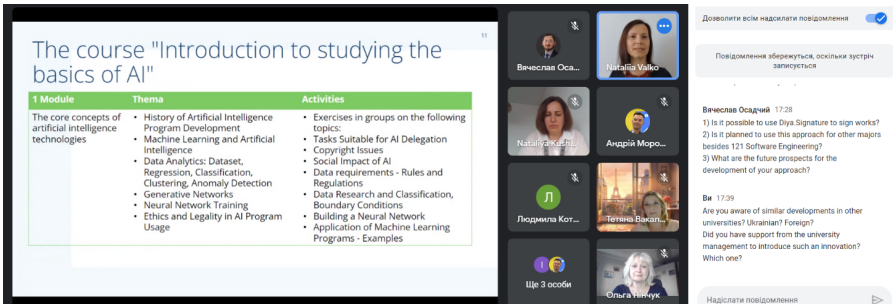

Figure 6: Screenshot under the report "Methodical aspects of studying artificial intelligence by future teachers".

tant. Traditional methods of preparing diploma papers can be expanded through innovative technologies. Application of virtual environments, online resources, and specialized software can make research and diploma paper preparation more accessible and effective. Methods and tools for conducting online defenses of these projects must be reliable and ensure an objective assessment of students' knowledge.

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6. Conclusions

This volume represents the proceedings of the International Workshop on Digital Transformation of Education (DigiTransfEd 2023), held in Ivano-Frankivs'k, Ukraine, on October 19, 2023.

It comprises 10 contributed papers [1, 2, 3, 4, 5, 6, 7, 8, 9, 10] that have been carefully peer-reviewed and selected from 26 submissions.

DigiTransfEd has received 26 submissions, including: full research articles, discussion, survey, or problem analysis papers, and short/research articles. Submissions were required to be original, not previously published, or under consideration for publication at the time of evaluation for this workshop. Each submission has been reviewed by at least 3 members of the program committee and was checked for plagiarism/self-plagiarism and fair citation of works of other authors.

The selection of articles for the proceedings has taken place in three stages:

- According to the quality of the works, as assessed by experts, 16 of the 26 articles have been selected for inclusion in the workshop program.
- During the presentation of research materials in English, each of them has been discussed.
- The organizers of the workshop have examined the quality of finalizing the texts of the articles in accordance with the recommendations and remarks of experts – members of the international program committee.

Thus, 10 articles have remained, of which 4 papers have been accepted as Short Papers and 6 papers have been accepted as Full Papers.

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