Digital Humanities Event Horizon

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ABSTRACT

This is an introductory text to a collection of selected papers from the Digital Humanities Workshop (DHW 2021), held in Kyiv, Ukraine, on the December 23, 2021. It consists of short introduction, papers' review and some observations about the event and its future.

CCS CONCEPTS

• **Human-centered computing**; • **Applied computing** → **Digital libraries and archives**;

KEYWORDS

Digital Humanities Workshop, DHW

1 INTRODUCTION

The seminal overview of meta-trends, changing the world by Snyder [20] identified universal connectivity as a transcendent premise of technological trends development. Through the span of the following predictive Global Trends frameworks, provide the hindsight in the lens through which technological growth and advances features in the global development trendsetting. The paradigm of these aspects is evolving from technological breakthroughs (Global Trends 2025 [1]) to accessibility of technology (Global Trends 2030 [2]) to transformative technology (Global Trends 2040 [3]), accordingly.

The sub-trend of the technological society development is manifested through the elaboration of an interdisciplinary paradigm of digital humanities – a diverse, open for augmentation, transdisciplinary range of areas of knowledge, applied activities and education in Arts and Humanities, centered on digital adaptation, production, processing, manipulation and dissemination of relevant thematic content: Digital history; Digital philology; Digital art; Digital education; Digital sociology; Digital music etc.

Dynamic transformation of the knowledge economy, enhanced by Industry 4.0/5.0 development and rise of the networked society in the Digital Age, emergency digitization of all social communicative spheres due to pandemic measures have imposed dramatic changes onto transdisciplinary overlap in different areas of human knowledge and experience, induced by the cross-sectorial job market demands of skills, activity workflow and measurable outcomes and key performance indicators.

The COVID-19 pandemic induced amplified digitalization measures in the social and industrial sphere. This end-to-end digital shift in the social and professional communication processes (communication, content, outcomes and outputs, skills) heralded the introduction of meta-disciplinary dimensions of learning and workflow arrangement – digital, hybrid and, blended. These meta-disciplinary dimensions can be considered conduits of vertical (endocentric) and horizontal (exocentric) transdisciplinary of digital humanities.

DHW (**D**igital **H**umanities **W**orkshop) is a peer-reviewed international workshop focusing on applications of digital technologies to the study of the humanities with the recognition that the printed word is no longer the main medium for knowledge production and distribution. The goal of DHW is to bring together researchers working on new ways of doing scholarship that involve collaborative, transdisciplinary, and computationally engaged research, teaching, and publishing.

Figure 1: DHW 2021 logo.

DHW 2021, December 23, 2021, Kyiv, Ukraine

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DHW 2021 topics of interest are:

- Theoretical, epistemological, methodological or historical aspects of Digital Humanities
- Digital approaches and applications in literary and linguistic fields, including computational text analysis, stylometry, authorship attribution, natural language processing and computational linguistics, digital philology and textual scholarship
- Digital approaches and applications in archaeology, architecture, and art history, including image processing, 3D modeling, digital restoration
- Digital history, geographic information systems applications in spatial humanities and historical studies, public history
- Digital approaches in music, film, theatre, and media studies; electronic art and literature, games studies, hacker culture, networked communities, digital divides, digital activism, open/libre networks and software, etc.
- Cultural heritage, digital cultural studies and research undertaken by digital cultural institutions
- Social, cultural, and political aspects of Digital Humanities including digital cultural studies, digital geopolitical studies, multilingualism and multiculturalism in Digital Humanities
- Emerging technologies such as physical computing, single-board computers, quantum computing, minimal computing, wearable devices, and haptic technologies applied to humanities research
- Institutional aspects of Digital Humanities, interdisciplinary aspects of scholarship, open science, public humanities, societal engagement and impact of Digital Humanities
- Digital Humanities pedagogy and academic curricula
- Digital Research infrastructures, digital libraries and virtual research environment, critical infrastructure studies, media archaeology, etc.
- Any other theme pertaining to the Digital Humanities

Digital Humanities Workshop 2021 that took place December 23, 2021, is a dream come true. Ukraine is now officially on the map of the centers of research in the digital humanities of Europe, with its clearly delineated outline of the digital dimensions of the humanities studies of language, learning and governance, in line with the Manifesto of Digital Humanism. DHW 2021 are research teams from 5 countries (Ukraine, Greece, Sweden, Estonia, Serbia).

DHW 2021 transpired as an open dialogue on broad philosophical issues of digital boundaries and measures in today's humanity (culture, education, communication, technology) and a detailed discussion on the technological features of digital processing of language signs, art objects and various types of human communication with the digital environment.

Taking into account the context of the erupted military intervention on Ukraine in February 2022, and the ensuing information warfare in various digital ambients (social media, news coverage, digital communications), the specific value of the DHW 2021 outcomes and outputs is allocated to the enhanced role of digital humanism as a tool of the internationally broadcast strife of Ukraine for freedom and sovereignty. For the first time in modern history the full inventory of interconnected areas of digital humanities (from fact-checking via digital archives, to AI-powered content

Figure 2: Social media on Russian aggression in Ukraine.

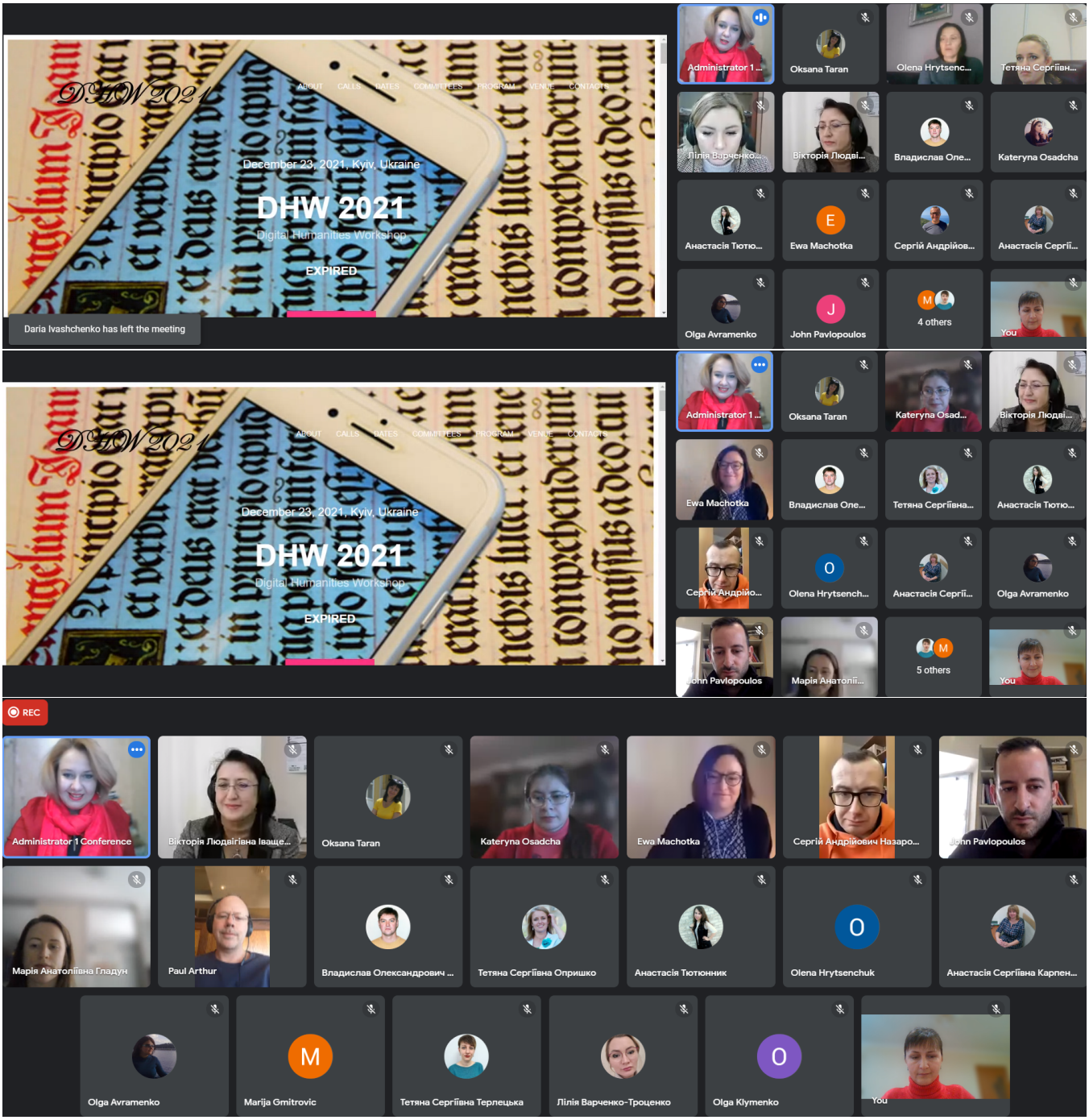
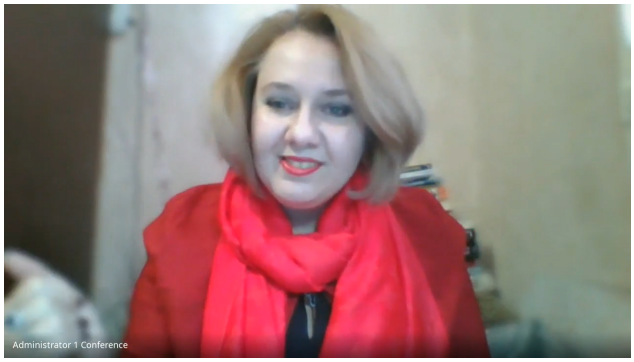


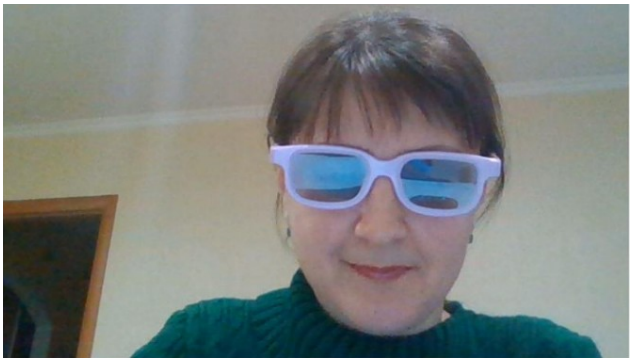
Figure 3: DHW 2021 highlights.

distribution algorithms and fake-news detection, to viral blogging and SMM, to big data processing and sociological analysis, to corpus analysis and computer assisted translation, digitally enhanced logistics coordination etc.) are implemented to achieve maximum advantage in the information warfare waged both on the cyberfront and in actuality. This development clearly heralds the branching out of digital humanities into new, undercharted areas of military digital humanities and digital peacekeeping, digital diplomacy.

DHW 2021 is also a national breakthrough in the international publishing platform ACM. Many thanks to the team of the Program Committee, international experts and reviewers who guaranteed the level of quality and thematic scale of the event.



(a) Rusudan Makhachashvili



(b) Iryna Mintii

Figure 4: DHW 2021 session chairs.

This volume represents the proceedings of the Digital Humanities Workshop (DHW 2021), held in Kyiv, Ukraine, on the December 23, 2021. It comprises 21 contributed papers that were carefully peer-reviewed and selected from 39 submissions. Each submission was reviewed by at least 3, and on the average 3.03, program committee members (https://publons.com/journal/1055537/digital-humanities-workshop/). The accepted papers present the state-of-the-art overview of successful cases and provides guidelines for future research.

2 DHW 2021 PROGRAM COMMITTEE

2.1 DHW 2021 Program Committee

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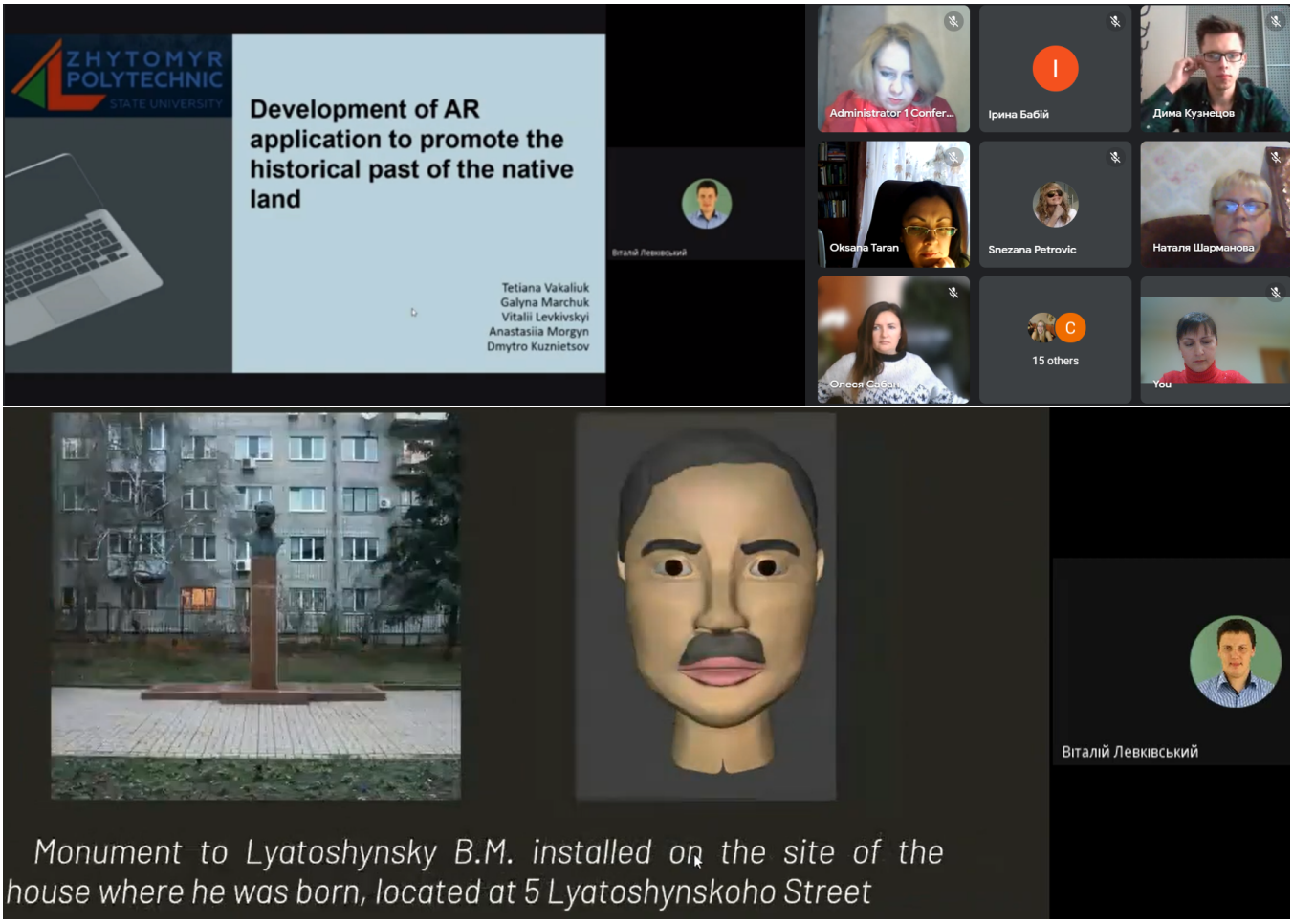


Figure 5: Presentation of paper [23].

3 DHW 2021 PAPERS OVERVIEW

The article "Development of AR Application to Promote the Historical Past of the Native Land" [23] by Tetiana A. Vakaliuk, Galyna V. Marchuk, Vitalii L. Levkivskyi, Anastasiia M. Morgun and Dmytro V. Kuznietsov (figure 5) demonstrates the possibilities of using augmented reality technology to create a software application in the field of local lore "Monuments of the city of Zhytomyr". The AR program "Monuments of the City of Zhytomyr" was implemented, the main task of which is to simplify the submission of information about people whose monuments are located in the city of Zhytomyr. To do this, nine 3D models were created, for each of which information was selected about the person to whom the monument is dedicated. Photographs of the sites were also taken for further use as triggers. Audio help is recorded for each model. The proposed development can be used to promote tourism and the history of the city. Augmented reality technology in the educational process has only just begun to develop and be increasingly used. We believe that this software application can be used in the educational process for such disciplines as "Local History", "Culturology", etc.

The aim of the study "Digital Drawing and Painting in the Training of Bachelors of Professional Education: Experience of Blended Learning" [17] by Kateryna P. Osadcha (figure 6), Viacheslav V. Osadchyi, Vladyslav S. Kruglyk and Oleg M. Spirin is to solve the problem of insufficient training of specialists who are able to meet the growing demand for projects in the digital design and computer games industry. Based on the analysis of the content of digital drawing and painting, two elective courses were implemented. They are: "Digital drawing with the basics of composition" and "Digital painting with the basics of color" for Bachelors of Professional Education majoring in digital technologies. In order to properly organize the process of blended learning, which was caused by quarantine restrictions due to the COVID-19 pandemic, appropriate tools to be used in the process of studying these courses, were selected. The Moodle distance learning platform and cloud technologies (Google Docs, Google Drive) were used to present theoretical material and set tasks for practical study. For operative communication with students VoIP program Discord was used. To develop students' skills of drawing from life and high-speed drawing we offered such Internet resources as Line of action, Character designs, Bodies in

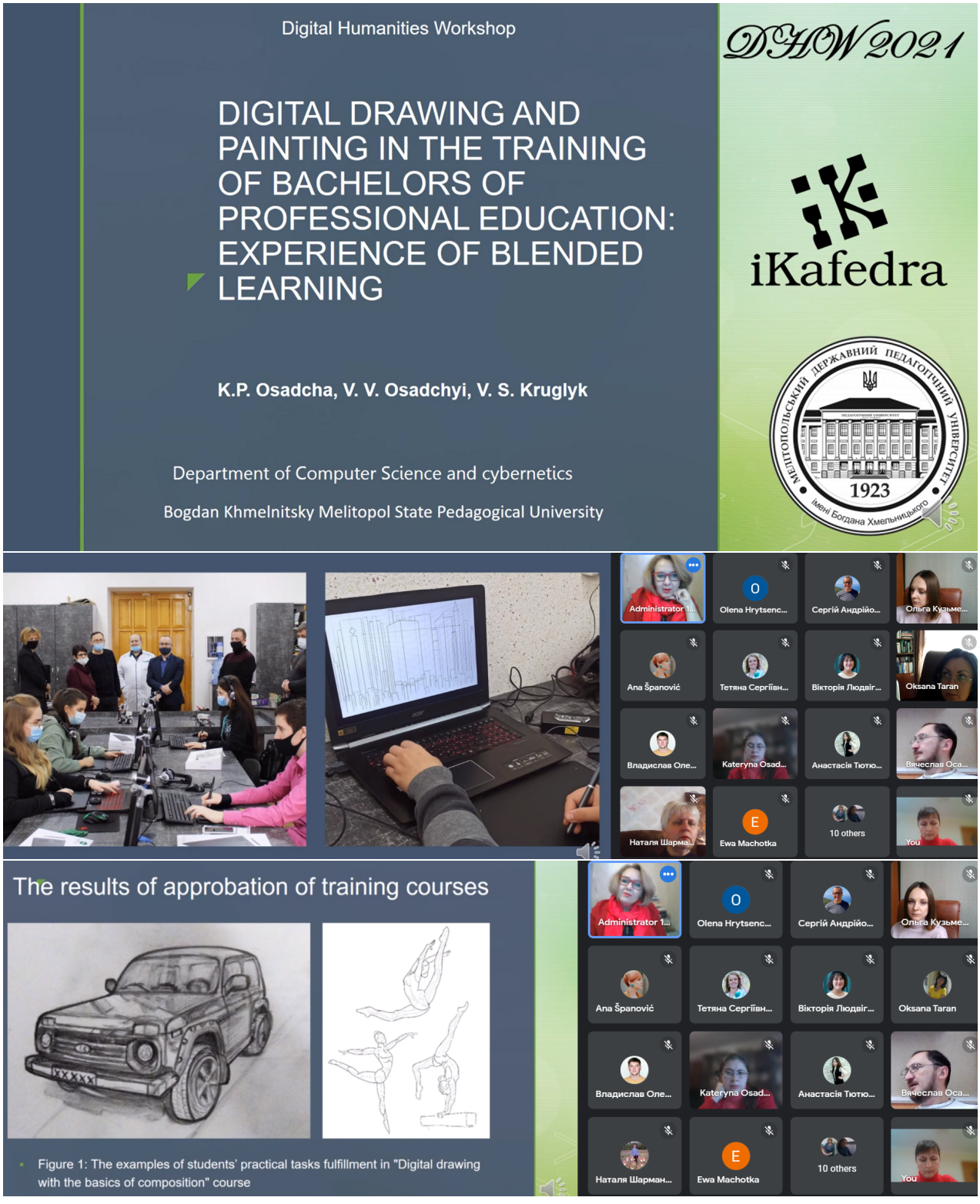


Figure 6: Presentation of paper [17].

Motion, Human anatomy for artist. Approbation of the developed courses in the institution of higher education in the conditions of blended learning and the results of the survey of students proved the effectiveness of the developed courses.

Modern academic librarians strive to qualitatively meet the information needs of their users. At the same time, librarians seek to take an active part in the organization and conduct of research. In the paper "Case Study: Citizen Science in Digital Humanities context" [16], Tetiana Opryshko and Serhii Nazarovets (figure 7) present the successful experience of Borys Grinchenko Kyiv University (Ukraine) in working on the wiki project "Dictionary of Borys Grinchenko" which uses elements of digital humanities, citizen science and gamification. The main aim of this project is to involve university students in getting acquainted with the Dictionary of the famous Ukrainian ethnographer and ethnographer Borys Grinchenko (1863–1910). During the project, students compete among themselves who will add the most quality explanations and visualizations of the Grinchenko's Dictionary words to the University wiki portal. The results show that this project not only promotes the development of university web resources but also promotes cultural heritage, develop successful team building, helps to the involvement of students in research activities. This experience will be useful for other academic libraries looking for ways to join the digital humanities and can be replicated in small, low-budget academic institutions.

E-terminography – one of the current areas of development of the digital humanism is in the limelight of the paper ""Lexical Minimum of Media Scientist": Reference Learning Edition as an Educational E-Resource" [10] by Victoria Ivashchenko, Vladyslav Yaskevych and Daria Ivashchenko (figure 8). It reveals the concept of terminological learning e-dictionary as an electronic reference edition and the typology of such dictionaries with examples. Special attention is given to the relevance of creating reference (namely dictionary) e-learning edition that contribute to a better study of terms and concepts of a particular subject area in professional learning, in particular educational e-resources of the combined type. It theoretically substantiates and describes stages of creating educational e-resource "Lexical Minimum of Media Scientist" focused on studying the cycle of media disciplines, which combines multimedia (audio, video, animation) fragments with visual and monomedia ones – in particular via text (in pdf) and hypertext fragments, using different semiotic codes – verbal and nonverbal with the possibility of interaction.

In the article "Software for Measuring Linguistic Literacy Rate of Students (Based on Comments Written in Ukrainian)" [7] by Ihor O. Drahushchak, Oksana S. Taran, Svitlana P. Bybyk, Olesya V. Saban and Natalia M. Sharmanova (figure 9), linguistic literacy rate is measured by the number of errors in students' comments on the web portal. The data comprising about 10,000 comments covering all regions of Ukraine over a period of 10 years has been analyzed. The stages of creating a software which interacts with the LanguageTool and enables generating the results of error analysis and classifying them by types and regions have been described. A map of linguistic literacy of Ukrainian students has been created. Also, the regions with the highest and lowest linguistic literacy and the main types of errors have been identified. The obtained data will make it possible to revise and adjust university language teaching programs in each region in the future.

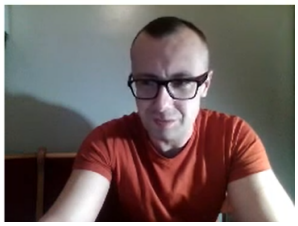
The paper "Stylometric Study of the Fiction Using Sketch Engine" [22] by Oksana S. Taran (figure 10), Oleksandra S. Palchevska, Alla A. Luchyk, Viktoriia V. Shabunina and Oksana V. Labenko deals with a stylometric study of I. Asimov's idiostyle considering a corpus-based approach. For the analysis of stylometric features the I. Asimov "Foundation" cycle text corpus was created. The quantitative and statistical processing of the text corpus is done via Sketch Engine tool that enables comparison of phrases and words in the following variants: lemma, token, subcorpus. The last parameter is important for distinguishing individual authorial features, comparing their combinability and identifying the dynamics of idiostyle. The following stylometric features of a text corpus by I. Asimov are described: quantitative morphological and lexical characteristics of the vocabulary, quantitative characteristics of occasionalisms' word formation and statistical estimation of occasionalisms' collocations. It is sated that the frequency of occasionalisms in the cycle of novels undergoes chronological change, as well as their combinability. In this paper, a method of occasionalisms' automated extraction due to keyness score was proposed, however, it requires the subsequent manual verification.

The article "Use of Digital Tools for Checking Uniqueness by Students and Academic Staff of the Borys Grinchenko Kyiv University: Problems and Solutions" [25] by Nataliia M. Vinnikova, Olena S. Aleksandrova, Olga M. Kuzmenko, Tetiana S. Opryshko and Anastasiia S. Karpenko (figure 11) examines the level of mastery by the Borys Grinchenko Kyiv University students, master's students, postgraduates, academic staff and researchers of the digital tools allowing to check the uniqueness of academic texts. The anti-plagiarism software most popular among the respondents was identified; its advantages and shortcomings, as well as the difficulties that arise when using it were analyzed. Proposals on how to increase the level of mastery of skills in self-regulation of educational and scientific activity, in particular writing own academic texts, for all participants in the Borys Grinchenko Kyiv University educational and scientific process were developed. Based on results of the survey, an algorithm for detecting the absence/presence of academic plagiarism in the student research papers submitted to the Ukrainian Competition of Student Research Papers in the Fields of Knowledge and Specialties was developed and launched, indicating the responsibility of all actors of the process for observance of the principles of academic integrity.

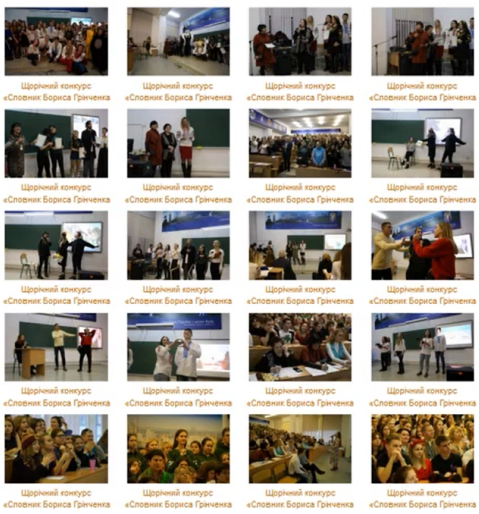
The study "Digital Interoperability of Foreign Languages Education" [13] by Rusudan Makhachashvili (figure 12), Ivan Semenist, Yurii Zatsnyi and Olga Klymenko is focused on the in-depth diagnostics of the development of digitally enhanced multipurpose orientation, universality and interdisciplinarity of skillsets for students of European (English, Spanish, French, Italian, German) and Oriental (Mandarin Chinese, Japanese) Languages major programs in Ukraine through the span of educational activities in the timeframe of COVID-19 quarantine measures of March 2020 to October 2021. The findings disclose a wide scope of generalized theoretical and applied issues, permeating the social and educational context worldwide: global event horizon and paradigm shifts in the interdisciplinary trends of digital education in the COVID-19 timeframe and beyond; transformative changes and avenues of development of the

Citizen Science in Digital Humanities Context

Tetiana Opryshko & Serhii Nazarovets



The annual competition "Dictionary of Grinchenko and modernity"



This competition is held in 2 stages:

1. The first stage involves the placement on the University wiki portal of links, images, videos, texts that complement the explanation and visualize the words from the Dictionary. The participant for the description of one word from the dictionary can gain a maximum of 20 points;

1. The second (final) stage of the competition takes place offline. A team of up to 5 people from each university's unit perform at the final stage of the competition. Each team presents the 3 best interpreted words of their choice. The performances of the teams are evaluated by a jury, and the winner is determined on the basis of the total nu points received by the teams for all stage competition.

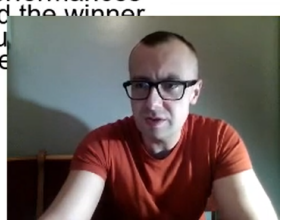


Figure 7: Presentation of paper [16].

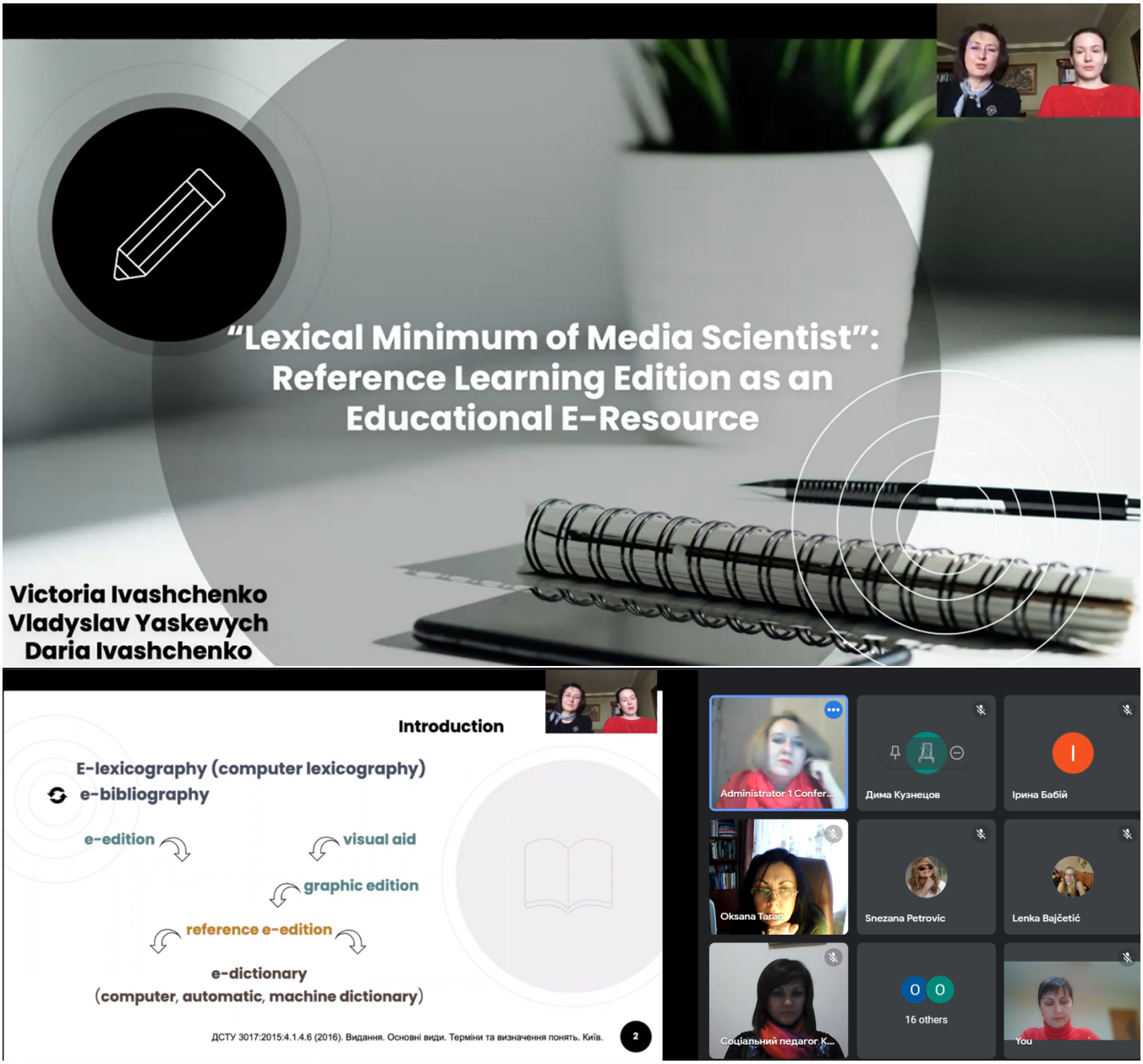
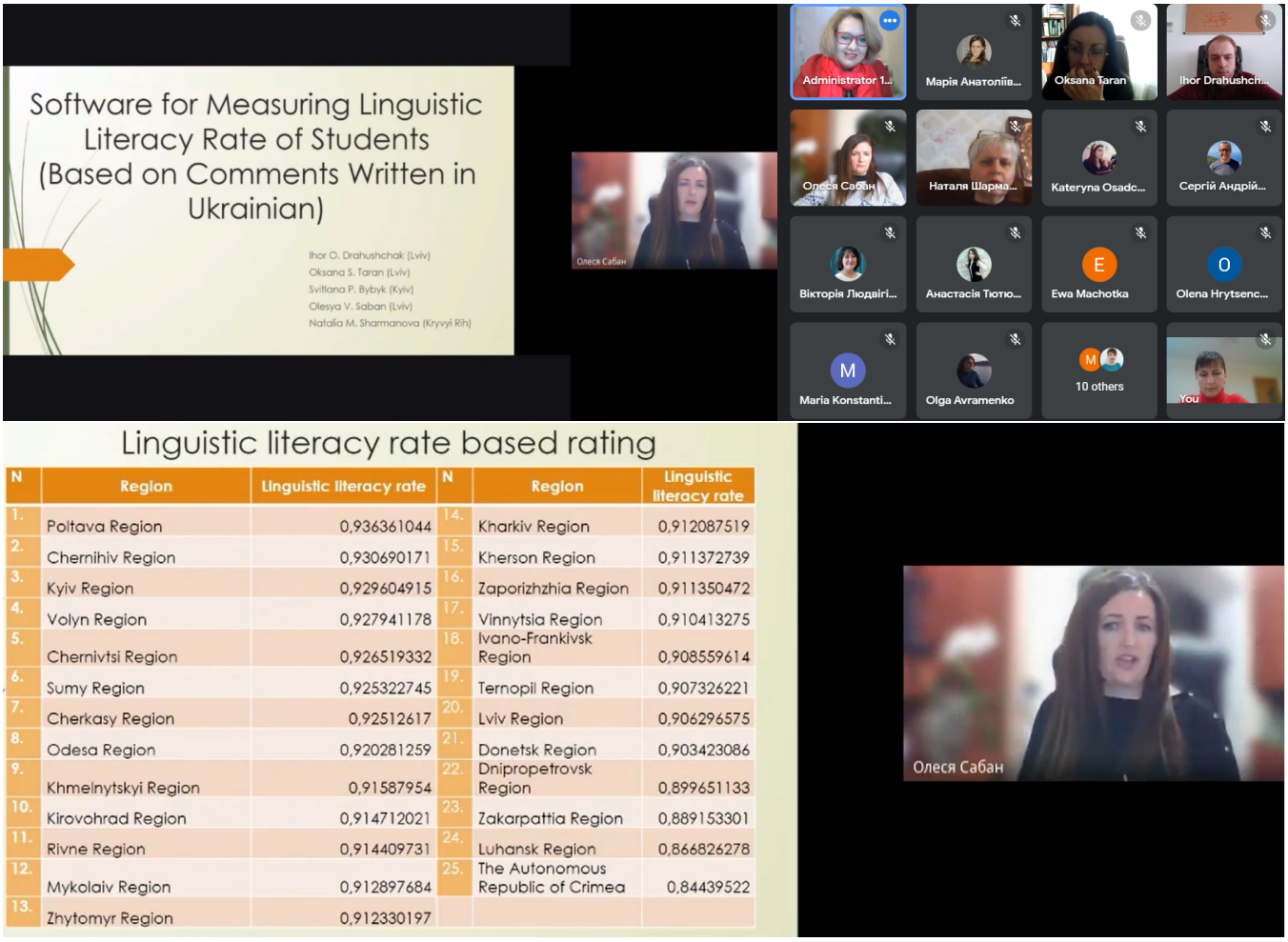


Figure 8: Presentation of paper [10].

network society and education as an interdisciplinary socio-cultural institution and industry in the digital age; global experiences, universal/generic challenges, technical advances and specific national gains in quality assurance of online and hybrid learning in the COVID-19 paradigm. A computational framework of digital interoperability and interdisciplinarity of foreign languages education is introduced in the study. The survey analysis is used to evaluate the digitally enhanced dimensions of interdisciplinarity, universality and transdiciplinarity, informed by the interoperability of soft skills and digital communication skills for foreign languages education across contrasting timeframes and stages of foreign languages acquisition and early career training.

The global pandemic and emergency digitization measures have introduced systemic challenges to the university summative and formative assessment workflow. Various modes of assessment for University-level programs are a strict regimen that consists of different elements and stages (oral, hybrid, and written exams, tests of different types, project presentations, internal and external review, expert evaluation, and peering). The study "Digital Formats



Linguistic literacy rate based rating

N	Region	Linguistic literacy rate	N	Region	Linguistic literacy rate
1.	Poltava Region	0,936361044	14.	Kharkiv Region	0,912087519
2.	Chernihiv Region	0,930690171	15.	Kherson Region	0,911372739
3.	Kyiv Region	0,929604915	16.	Zaporizhzhia Region	0,911350472
4.	Volyn Region	0,927941178	17.	Vinnytsia Region	0,910413275
5.	Chernivtsi Region	0,926519332	18.	Ivano-Frankivsk Region	0,908559614
6.	Sumy Region	0,925322745	19.	Ternopil Region	0,907326221
7.	Cherkasy Region	0,92512617	20.	Lviv Region	0,906296575
8.	Odesa Region	0,920281259	21.	Donetsk Region	0,903423086
9.	Khmelnytskyi Region	0,91587954	22.	Dnipropetrovsk Region	0,899651133
10.	Kirovohrad Region	0,914712021	23.	Zakarpattia Region	0,889153301
11.	Rivne Region	0,914409731	24.	Luhansk Region	0,866826278
12.	Mykolaiv Region	0,912897684	25.	The Autonomous Republic of Crimea	0,84439522
13.	Zhytomyr Region	0,912330197			

Figure 9: Presentation of paper [7].

of Learning Outcomes Assessment in the COVID-19 Paradigm: Survey Study" [15] by Nataliia Morze, Rusudan Makhachashvili, Liliia Varchenko-Trotsenko (figure 13) and Liliia Hrynevych aims to critically analyze the practices of Borys Grinchenko Kyiv University in various forms and modes of digital assessment for stakeholders of Liberal Arts, Education, and Computer Science major programs, implemented in the years 2020–2021 through quarantine induced digital learning. The survey analysis was conducted to evaluate ICT tools and digital competencies that are implemented to compare and contrast traditional and formative assessment practices, translated into the digital hybrid format. The investigation novelty is attained through systemic empirical findings on experiences and techniques of learning outcomes assessment in the emergency digitization measures, contrastive assessment of different modes in digital learning, evaluation of ICT tools and skills, implemented through different forms of assessment in the digital learning context.

The successful transformation of a country to an advanced digital state is substantially dependent on education and more specifically, the development of an e-Governance curriculum in higher institutions. Estonia as a role model has demonstrated that e-Governance implementation significantly stems from a strong collaboration between stakeholders such as the state, private sector, and academia. The study "Educating Future Digital Leaders: Developing e-Governance Curriculum in Estonia and Ukraine" [14] by Nataliia Morze, Rusudan Makhachashvili (figure 14), Gvantsa Mosiashvili and Ingrid Pappel aims to examine the risk factors of e-Governance curriculum development in an emergent e-democracy state – Ukraine, and how lessons learnt from Estonia's digital transformation can be used for coping with underlying risks. To conduct this research, a survey on Digital Competence in e-Governance Education in Ukraine was conducted along with analyzing secondary data related to Estonia's case. The results suggest that issues related to e-Governance curriculum implementation in Ukraine include comprehensive factors like low digital competence and low awareness in available trainings in e-Governance, as well as access to technology and respected e-learning sources. Thus, the recommendations which stem from Estonia's experience as an e-state are suggested for overcoming the risk factors that Ukraine faces in e-governance curriculum development.

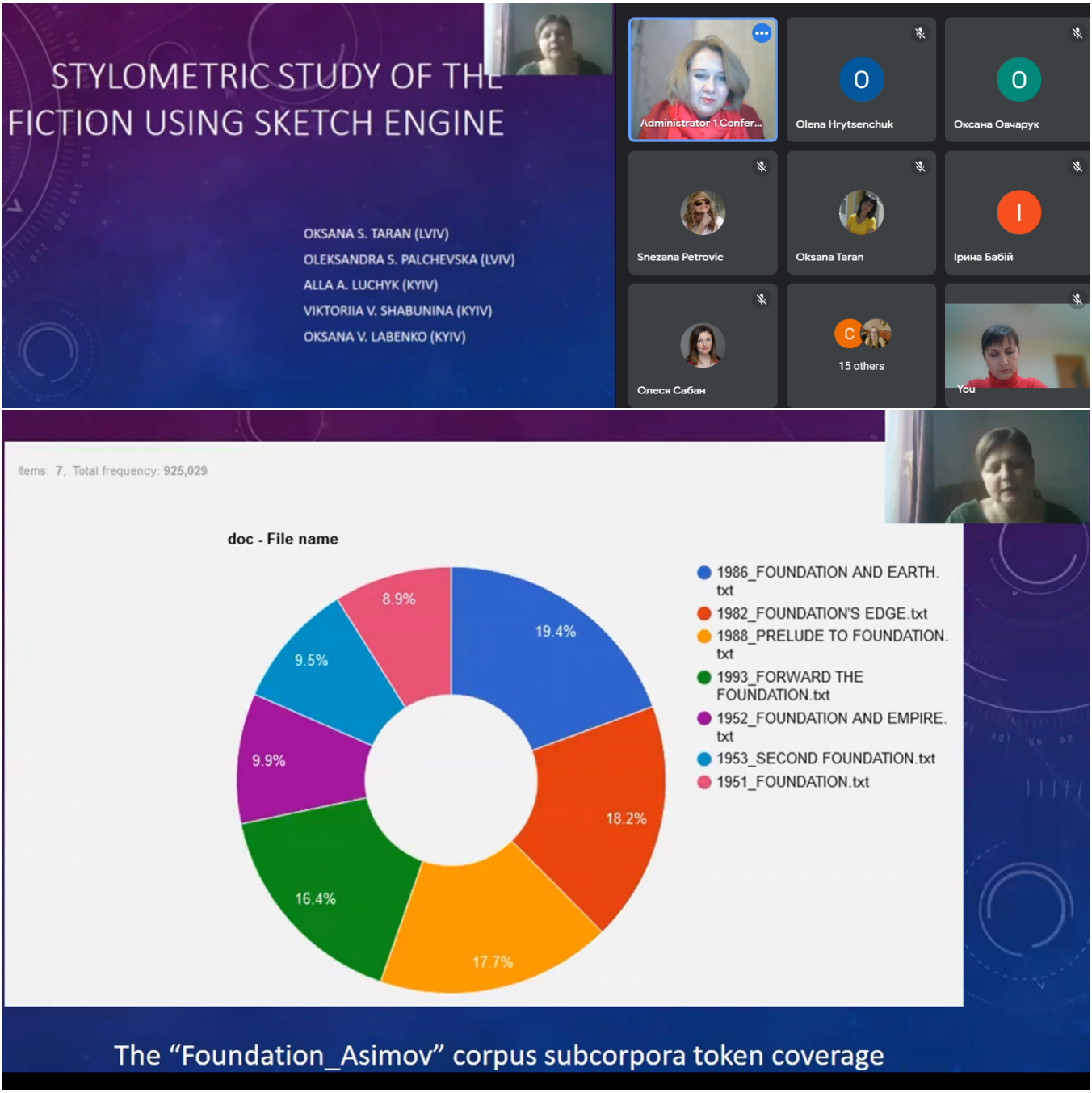


Figure 10: Presentation of paper [22].

The paper “Automated Recognition of Geographical Named Entities in Titles of Ukiyo-e Prints” [6] investigates the application of Natural Language Processing as a means to study the relationship between topography and its visual renderings in early modern Japanese ukiyo-e landscape prints. Marita Chatzipanagiotou, Ewa Machotka and John Pavlopoulos (figure 15) introduce a new dataset with titles of landscape prints that have been annotated by an art historian for any included place-names. The prints are hosted by the digital database of the Art Research Center at the Ritsumeikan University, Kyoto, one of the hubs of Digital Humanities in Japan. By applying, calibrating and assessing a Named Entity Recognition (NER) tool, Chatzipanagiotou et al. [6] argue that ‘distant viewing’ or macroanalysis of visual datasets can be facilitated, which is needed to assist art historical studies of this rich, complex and

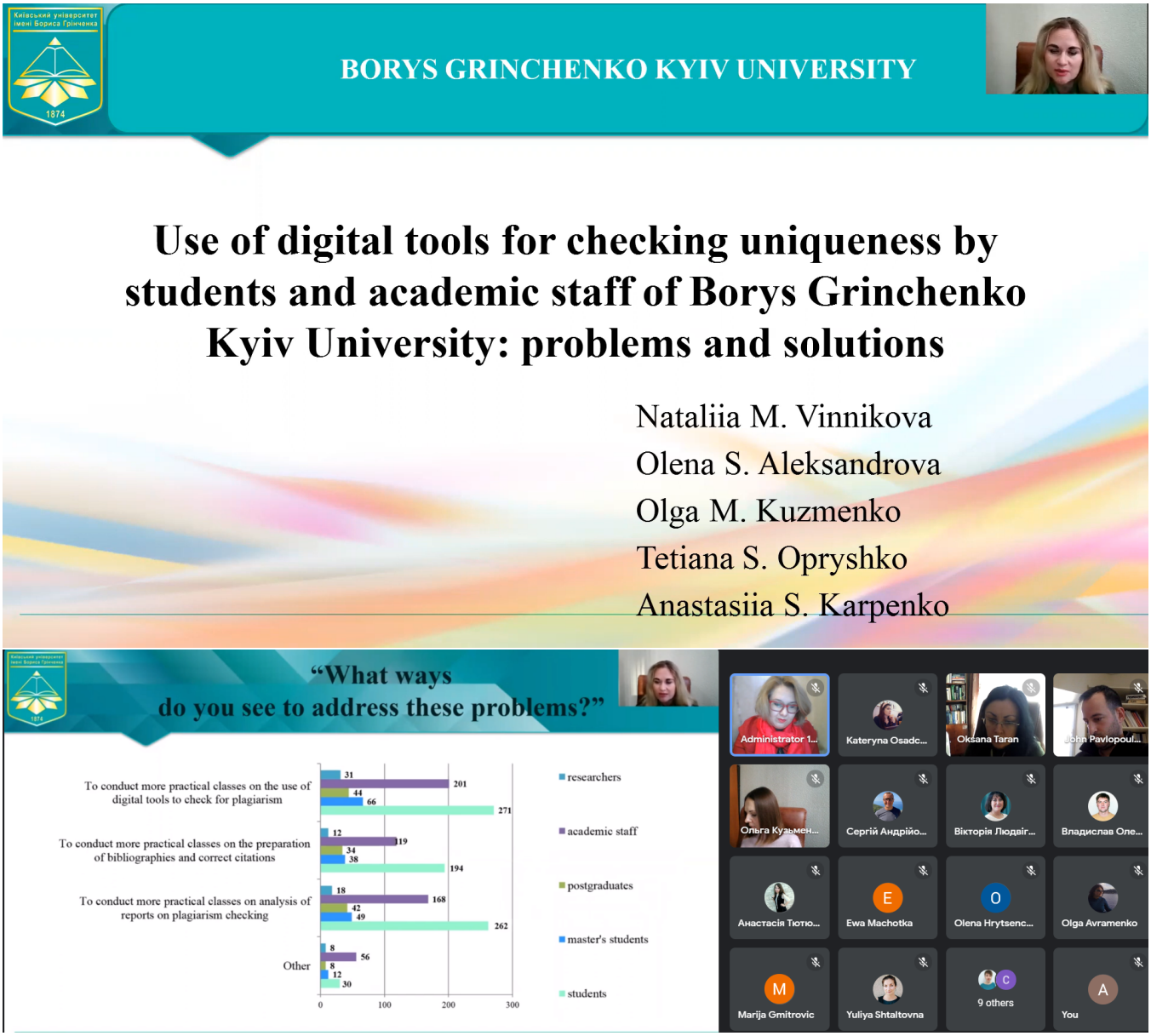


Figure 11: Presentation of paper [25].

diverse research material. Experimental results indicated that the performance of NER can be improved by 30% and reach 50% precision, by using part of the introduced dataset.

The paper "Digitization of the Serbian folk proverbs compiled by Vuk S. Karadžić" [4] by Lenka Bajčetić, Marija Gmitrović, Ana Španović and Snežana Petrović (figure 16) aims to present the digitization process of a very important piece of Serbian intangible cultural heritage, *Serbian folk proverbs and other common expressions and phrases*, compiled by Vuk Stefanović Karadžić during the first half of the 19th century. In the paper, we discuss the necessary steps in the digitization process, the challenges we had to deal with as well as the solutions we came up with. The goal of this process is to have a fully digitized, user-friendly version of *Serbian folk proverbs*, that will also easily integrate and be compatible with other digitized resources and/or multi-dictionary portals.

Iliad and Odyssey are products of a collective effort involving numerous authors, each contributing unknown portions of text, and it still cannot be determined whether a single individual (or distinct group of poets) contributed larger chunks of such additional verses, or even whole Books. In the paper "Computational Authorship Analysis of Homeric Language" [8], Maria Fasoi, John Pavlopoulos (figure 17) and Maria Konstantinidou employed character-level statistical language modeling to analyse the computational authorship of Homeric text and study the linguistic proximity and divergence

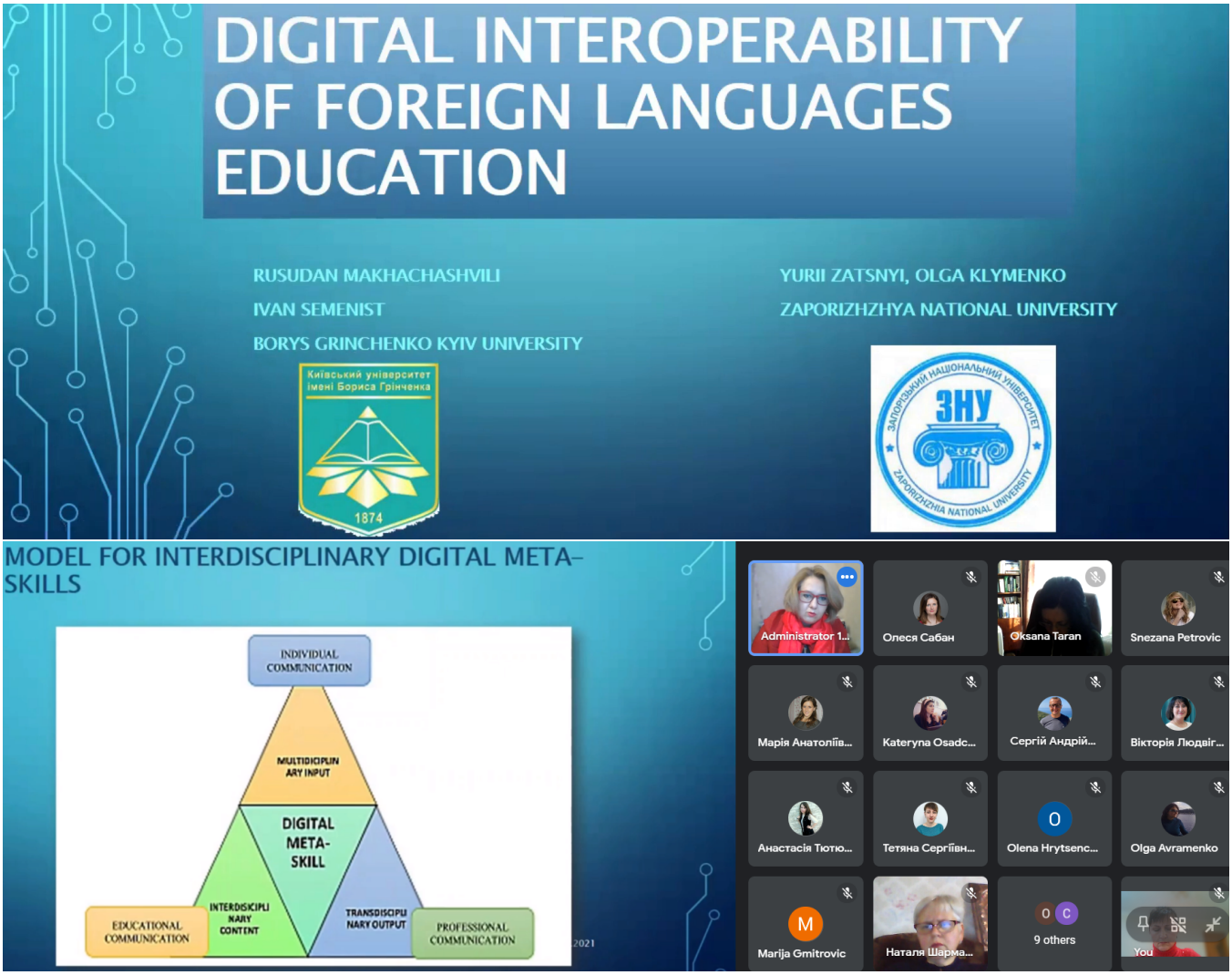


Figure 12: Presentation of paper [13].

between the books of Iliad and Odyssey. Fasoi et al. [8] show that some pairs of books are much closer than others and that some books are linguistically far from the rest. Furthermore, Fasoi et al. [8] investigated the linguistic association between the Homeric poems and four Homeric hymns, showing that *"To Aphrodite"* is linguistically close and that *"To Hermes"* is linguistically far from both, Iliad and Odyssey. In a final experiment, Fasoi et al. [8] show that statistical language models can be used to classify excerpts between Iliad and Odyssey similarly to the average human expert.

The design of learning environment is the central theme of paper "Creation and Development of the Digital Learning Environment in Educational Institutions" [9] by Olena O. Hrytsenchuk (figure 18) and Sergii I. Trubachev. The modern digital learning environment of educational institutions should be flexible and personalized, meet the needs, requirements and wishes of teachers, students and the educational institution. Education with the use of digital tools has become relevant today in the quarantine of COVID-19. The educational process takes place regardless of time and place. It requires quick and easy access to information and educational resources. The digital learning environment of the educational institutions provides these conditions. The components of the digital learning environment of the educational institutions should provide the main functions in the process of learning and education: learning, communication, cooperation, assessment and testing, planning and management, presentation and evaluation of tasks. The approach of creating and using the digital learning environment of the educational institutions involves the use of all its elements, namely: IT services, applications, systems, etc., which can be easily combined, updated, added, deleted, changed. This approach will create and develop the digital learning environment of the educational institutions that can be adapted to innovation in education and ICT.

The article "Digital Competence of Future Researchers: Empirical Research of PhD Students of Ukrainian University" [11] by Nataliia

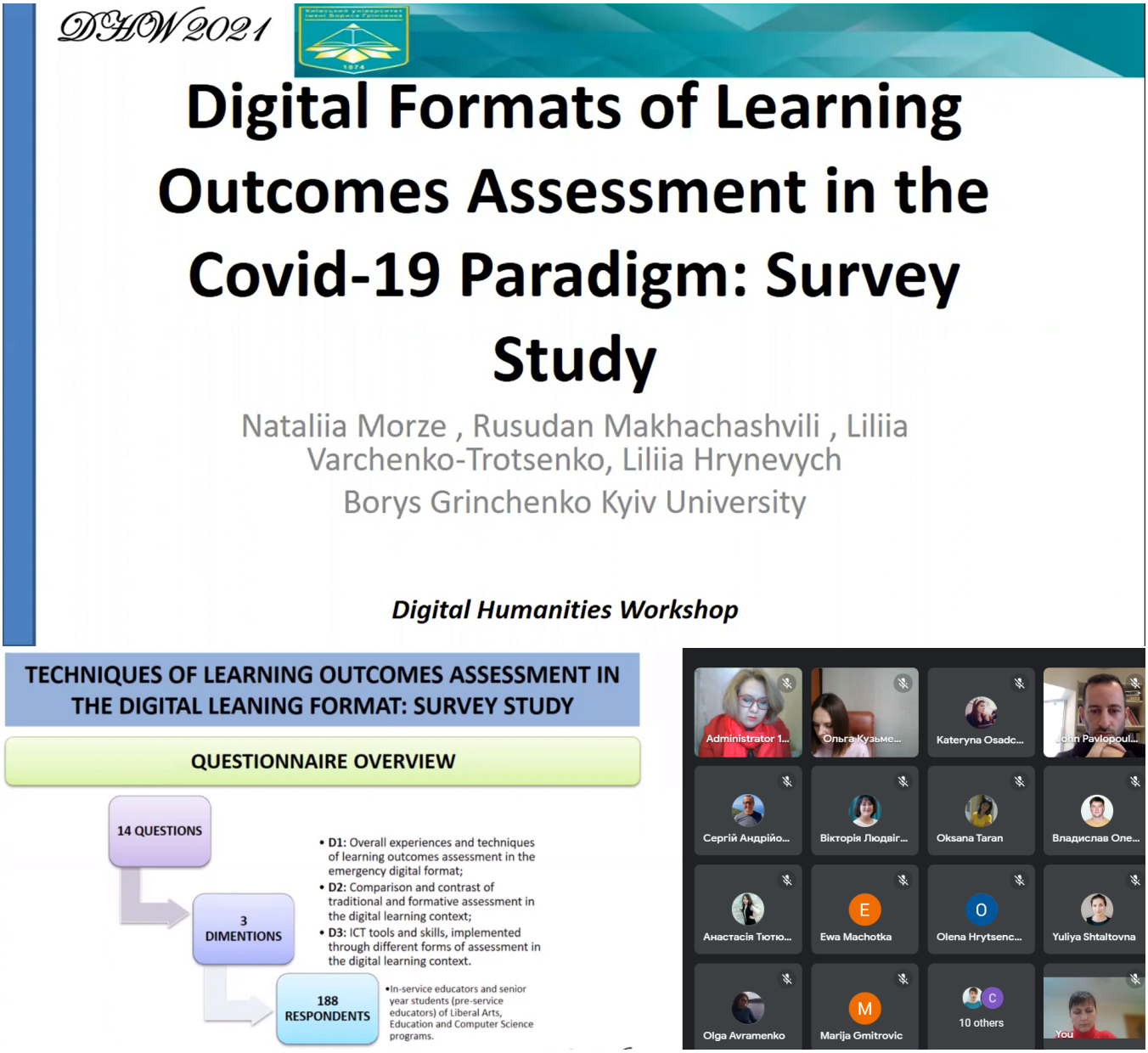


Figure 13: Presentation of paper [15].

Morze, Olena Kuzminska, Liliia Varchenko-Trotsenko, Maria Boiko (figure 19) and Mariia Prokopchuk analyzes the experience of Jisc, which provides digital solutions for education and research in the UK, which became the basis for additional research on scaling the Jisc Reseacher model for the formation of digital competence of graduate students in higher education in different countries. The digital competence of the PhD students researcher of a particular educational institution is considered as a factor influencing the quality of education and the readiness of PhD students for its development. The result of the study is to determine the readiness of PhD students of Borys Grinchenko Kyiv University to acquire and develop their own digital competence of the researcher. The readiness to acquire and develop digital competence of graduate students both at the level of resource provision and basic digital competence and motivation of future researchers was confirmed by conducting a survey of the experimental group of graduate students of the 1st year of study. To identify general or specific problems for graduate students based on the analysis of average group values for each group of Jisc Reseacher competencies, unformed digital competencies of researchers were identified and the author's interpretation of the causes and prospects of development was given

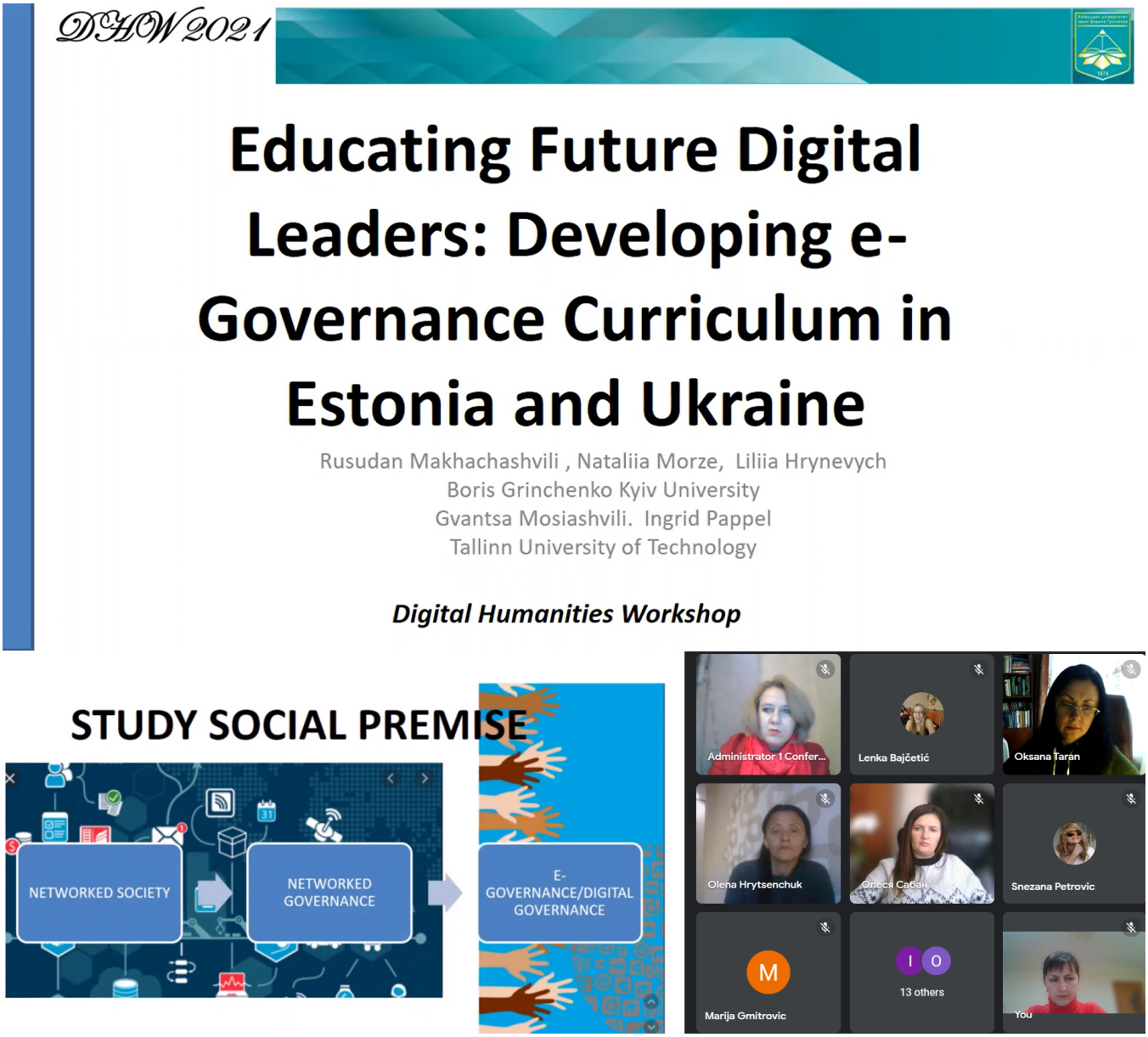


Figure 14: Presentation of paper [14].

The paper "Emoji Explication in Digital Communication: Logical-Phenomenological Experiment" [12] by Rusudan Makhachashvili (figure 20), Anna Bakhtina, Ivan Semenist, Ganna Prihodko and Olexandra Prykhodchenko examines the digital linguistic sign Emoji in digital communication through the logical-linguistic lens. It is concluded that the explication of the content plane and expression plane of an optical digital sign due to the bilaterality of its structure is inexhaustible, because emoji optics include psychophysiological factors that appeal to both linguistic and extralinguistic elements of sign formation. Consequently, the substrate for the study of the emoji sign is its polylaterality. The latter allows the synthesis of structural (logical) with the conceptual (phenomenological) level of explication of the sign, because the plane of content and the plane of expression of the optical sign in digital communication is both in its form and in the semantic load. The study focuses on an empirical experiment – an online survey called "Emoji-association", which contains 147 perceptions and interpretations of emoji signs from recipients. The experiment results are tested through G. Frege's semantic triangle, which schematically demonstrates a bilateral approach to the plane of content, depending on both the abstract denotation (word proper) and the specific meaning. With emphasis on polylaterality and its verification, hypothetical-deductive syllogisms are created, which includes interpretive tokens, which, according to digital analysis of answers using the web-application

ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

Automated recognition of geographical named entities in titles of *ukiyo-e* prints

MARITA CHATZIPANAGIOTOU, Athens University of Economics and Business
EWA MACHOTKA, Stockholm University
JOHN PAVLOPOULOS, Stockholm University

Kiev, 23.12.2021

Stockholm University

3. Dataset development

Ukiyo-e Portal Database, Art Research Center, Ritsumeikan University, Kyoto (screenshot)

3. Dataset development

- Sampled 200 prints, in two batches, out of the 20,408 available prints.
- Annotated by an art historian, expert in Japanese early modern history.
- Regarding place names in the titles and the inscriptions.
- GPE: place names that can be pinned on a map (city names, temples, etc.)
- LOC: place names less-easily pinned on a map (roads, etc.).

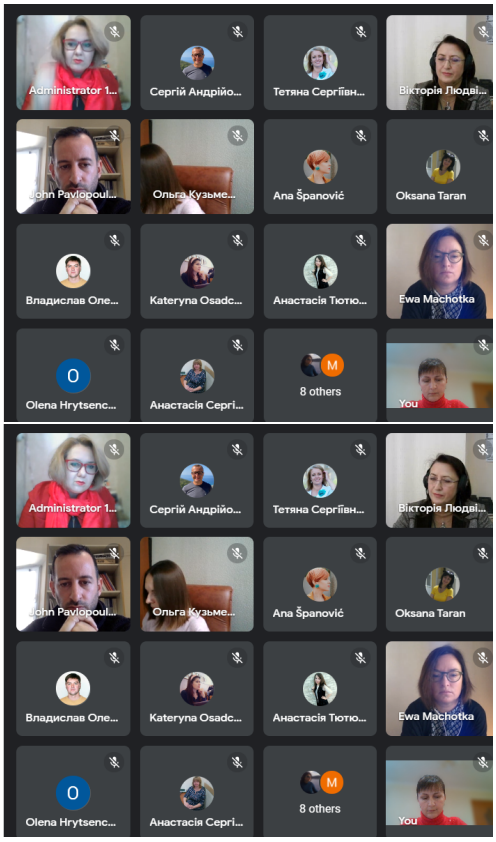


Figure 15: Presentation of paper [6].

Figure 16: Presentation of paper [4].

package Voyant Tools, are more common in frequency. According to the results of the experimental logical-linguistic approach to the study of the emoji sign in digital communication, it is concluded that the logical tools applied in the study, provide for the fractalization of agrammatical formants of the emoji sign with the verbal versions of its formants, with subsequent verification of both.

The article "Digital Educational Environment of a Modern University: Theory, Practice and Administration" [24] by Tamara G.

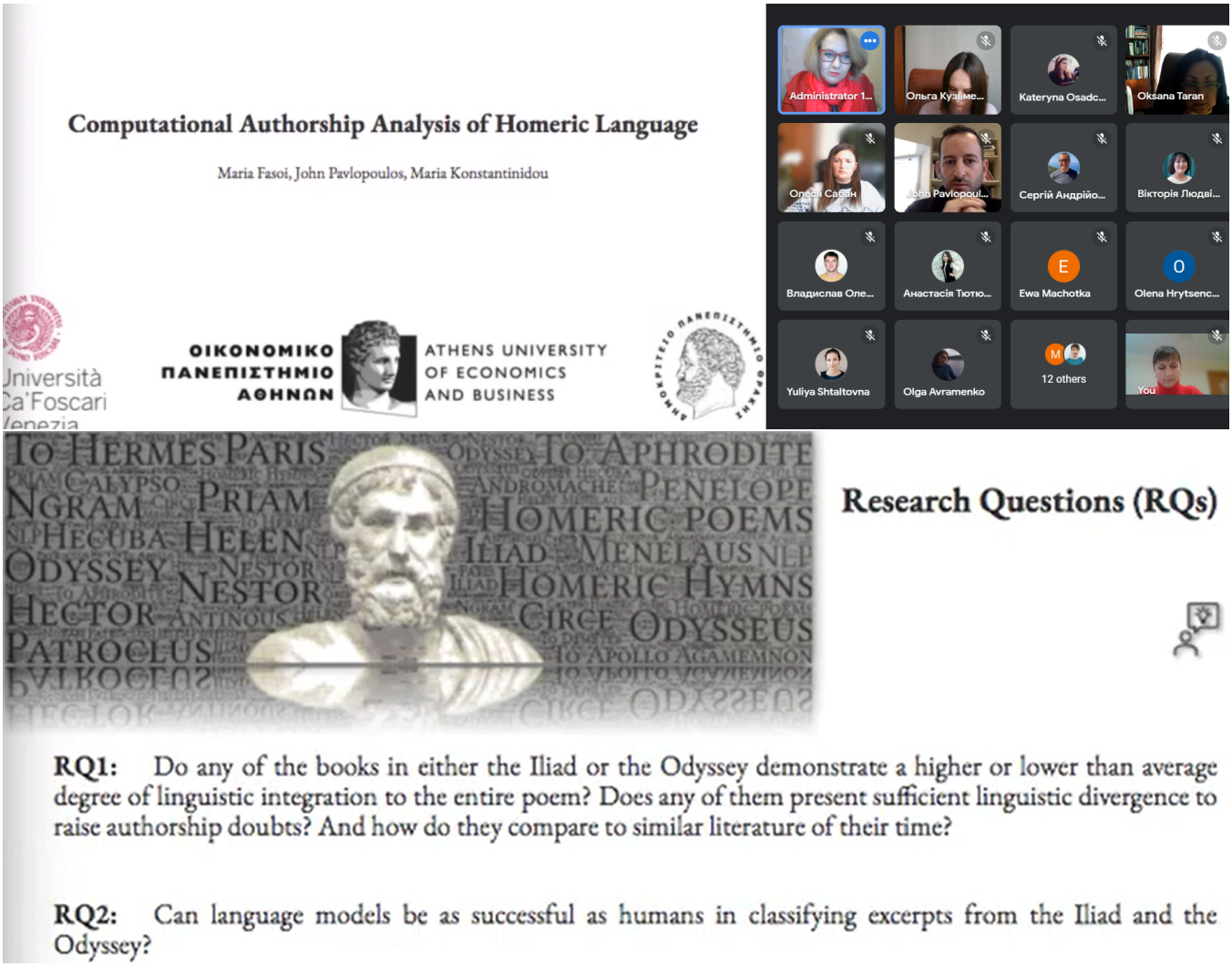


Figure 17: Presentation of paper [8].

Vasyliuk (figure 21), Ilia O. Lysokon and Iya M. Shimko reveals theoretical and practical aspects of the digital educational environment of a university. The main normative and legal documents of Ukraine regulating the informatization of the sphere of national education are determined. The experience of introduction of the system of electronic educational courses by the leading institutions of higher education of Ukraine is analysed; the concepts of "distance education", "digital educational environment", "educational management" are specified. It has been found that education is a social institution with its own laws, principles and regulations, so the ability to manage education is as important and difficult as finding the right vector for development of all mankind. The benefits of education transformation are listed: development of students' self-determination, ability to concentrate on the most valuable teaching material; increase of mobility of personality, ability to adapt to the dynamic environment; ensuring cooperation with diverse audiences; creating an individualized educational trajectory of the student; comfortable learning environment. An attempt is made to identify the definition of "digital educational environment" as a set of relevant resources that is able to ensure the implementation of educational, scientific, international and managerial activities of higher educational institutions. It was established that higher educational institutions of Ukraine in the conditions of distance learning increase the capacity of the digital educational environment. The conditions and modern vectors of information educational development are considered, and the basic problems, needed to be resolved at the state level, are defined. Strengths (flexible schedule of educational tasks, provision of inclusiveness, control and evaluation of the results of educational activities, individual consultations in remote mode, etc.) and weaknesses revealed of the development of the digital educational environment (the delay in the creation of digital training courses, lack of information literacy of teachers, low level of integration of digital learning environment and teaching disciplines, etc.). Presented the model of digital education

Figure 18: Presentation of paper [9].

environment of the university from the position of organizational and administrative activity. Described four operational modules of the specified model: scientific and technical module (repository, open publication system, digitalization of the library fund); educational module (electronic management system of educational courses, online learning, control of students' knowledge quality); administrative module (electronic document management, education environment management, digital archive, online questionnaires, operational process management, digital security systems, innovative activities in the education and information environment); informational module (official website of the institution of higher

Figure 19: Presentation of paper [11].

education, personal pages of teachers, 3D-courses, pages of the university in social networks). It is established that the level of compliance of all activities of the designated operational areas is an indicator of the successful functioning of the university under the conditions of digitalization of the educational environment.

The article "The Use of Open Electronic Scientific and Educational Systems to Support the Professional Activities of Research and Teaching Staff of Ukrainian Universities and Scientific Institutions" [21] by Oleg M. Spirin, Olga V. Matviienko, Svitlana M. Ivanova, Oksana V. Ovcharuk, Iryna S. Mintii (figure 22), Iryna V. Ivaniuk, Liliia A. Luparenko is devoted to the analysis and description of open electronic scientific and educational systems (OESES) and their use by scientific and pedagogical staff in Ukrainian universities and research institutions. The contribution of the use of open electronic systems by scientists and professors into the professional activity is considered. The results of experimental verification of the use of OESES and their impact on the research competence of teachers and researchers are presented. Based on the analysis of domestic and international research, the authors' own experience, the concept of open electronic educational systems designed to effectively organize and support research in education, pedagogy, social and behavioral sciences. The results of experimental research on the development of information and research competence of Ukrainian teachers and researchers during the use of open electronic systems

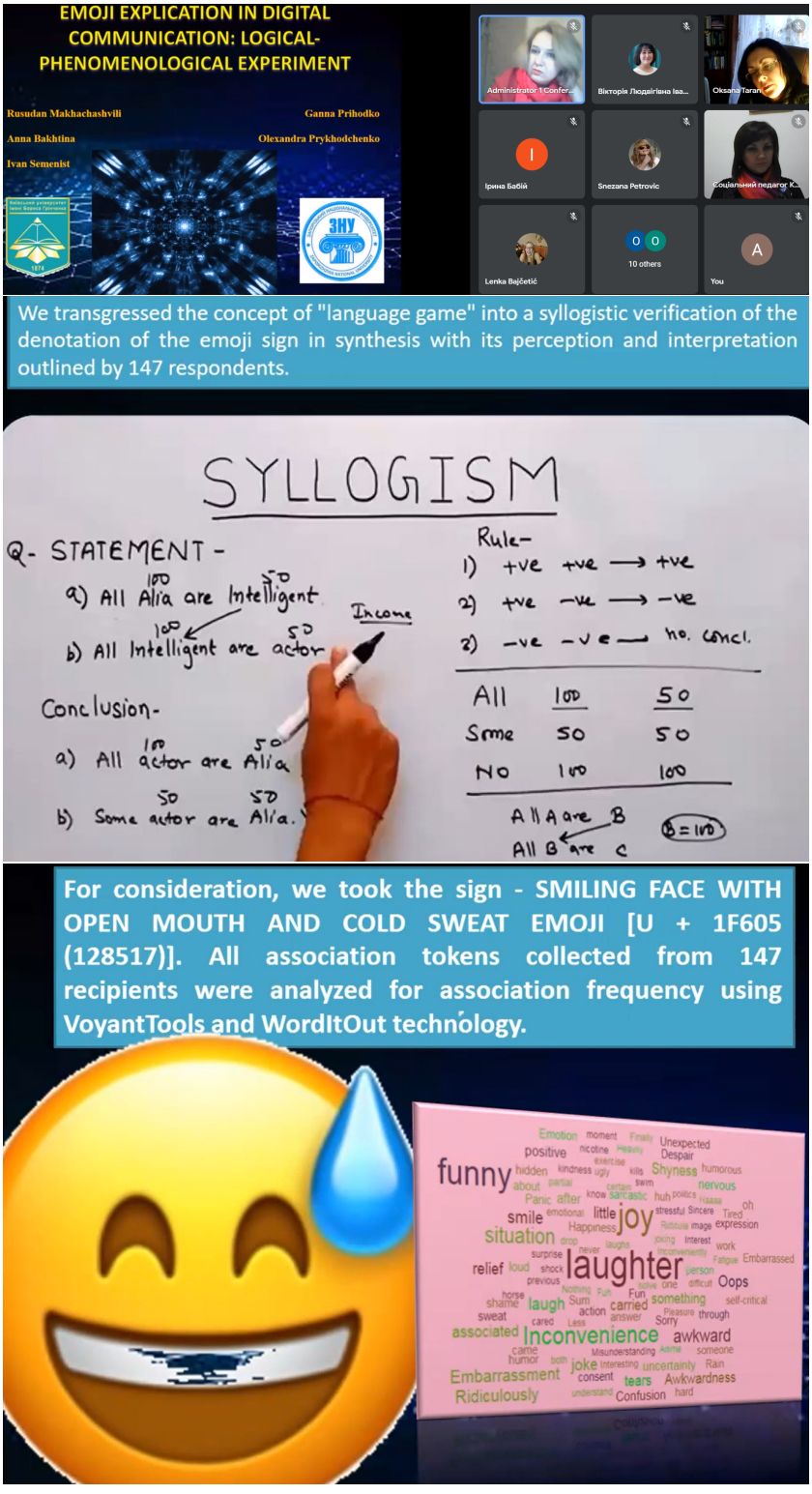


Figure 20: Presentation of paper [12].

Figure 21: Presentation of paper [24].

are presented. The necessity of creating an environment for the development of information and research competence of university teachers and scientists is substantiated. The scientific novelty is based on the obtained results and is that it is proposed to include in the structure of such environment the following elements: scientific electronic libraries, electronic open journal systems (EOJS), scientometric databases, electronic social networks, and quality assessment systems for pedagogical tests, digital identification systems for scientists and scientific publications, software verification uniqueness of texts. Today, these tools are in demand and widely used for the organization of scientific and educational activities in educational institutions and research institutions around the world.

The article "Utilization of E-Learning System for Innovative Methods Implementation in Humanities Pedagogy" [5] by Oksana

Figure 22: Presentation of paper [21].

Buinytska, Liliia Varchenko-Trotsenko, Tetiana Terletska and Anastasiia Tiutiunnyk (figure 23) presents the results of the research on e-learning system utilization at Borys Grinchenko Kyiv University by humanities students and teachers. Digitalization of humanities pedagogy is an integral part of the educational process today and e-learning systems belong to the most powerful digital instruments used at higher education institutions. Therefore, the topic of digital humanities implementation in existing at universities e-learning systems is high on the agenda. In particular, attention should be paid to the possibility of innovative teaching methods utilization with the help of the e-learning system resources. The authors focus on the capabilities of LMS Moodle for implementation of collaboration, flipped classroom technology, peer assessment and project-based learning. Utilization of such activities as Workshop, Wiki, Google Meet for Moodle as well as instruments and settings (embedded video, group submission) for implementation of innovative teaching methods are considered. The correlation between the request of humanities teachers and students and Moodle LMS options for its implementation is shown.Increased use of the e-learning system for innovative teaching methods provision is highlighted as a development area for humanities teachers.

In the paper “Mask and Emotion: Computer Vision in the Age of COVID-19” [18] by Serhiy O. Semerikov, Tetiana A. Vakaliuk, Iryna S. Mintii, Vita A. Hamaniuk, Vladimir N. Soloviev, Olga V.

Figure 23: Presentation of paper [5].

Bondarenko, Pavlo P. Nechypurenko, Svitlana V. Shokaliuk, Natalia V. Moiseienko and Vitalii R. Ruban (figure 24), educational applications of computer vision are considered. Computer vision systems since the early 1960s have undergone a long evolution and are widely used in various fields, in particular, in education for the implementation of immersive educational resources. When creating machine vision systems for educational purposes, it is advisable to use the computer vision libraries based on deep learning (in particular, implementations of convolutional neural networks). Computer vision systems can be used in education both under normal and pandemic conditions. The changes in the education industry caused by the COVID-19 pandemic have affected the classic educational applications of computer vision systems, modifying existing ones and giving rise to new ones, including social distancing, face mask recognition, intrusion detection in universities and schools, and vandalism prevention, recognition of emotions on faces with and without masks, attendance monitoring. Developed on the basis of Microsoft Cognitive Toolkit and deployed in the Microsoft Azure cloud, a prototype computer vision system integrates emotion recognition of students and detection of violations of the mask regime, additionally providing the ability to determine gender, smile intensity, average age, makeup, glasses, hair color, etc. with a high degree of reliability.

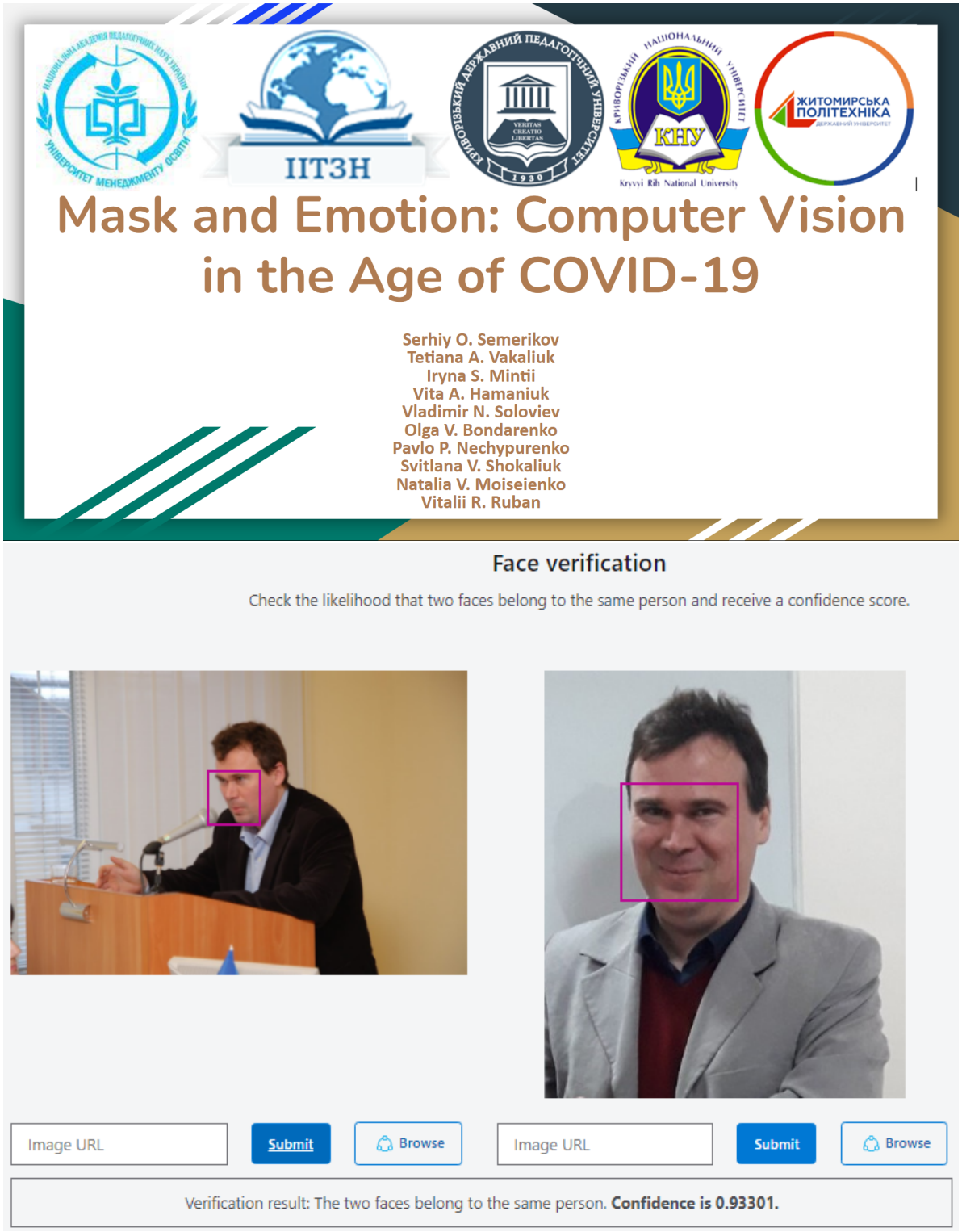


Figure 24: Presentation of paper [18].

Figure 25: Presentation of paper [19].

Proper design is the basis for the success of any application development, regardless of industry and field of application. This fully applies to both software design and learning design. Designing e-learning resources is a hybrid activity that significantly increases risks due to the speed of technological change. The risks are even greater when it comes to technologies of increased attention - immersive. In this regard, it is important to develop design methods of immersive e-learning resources – educational, scientific, informational, reference materials and tools used in an immersive environment, reproduced by immersive technical tools, and necessary for effective organization of the educational process. In the paper "Immersive E-Learning Resources: Design Methods" [19] by Serhiy O. Semerikov, Tetiana A. Vakaliuk, Iryna S. Mintii, Vita A. Hamaniuk, Vladimir N. Soloviev, Olga V. Bondarenko, Pavlo P.

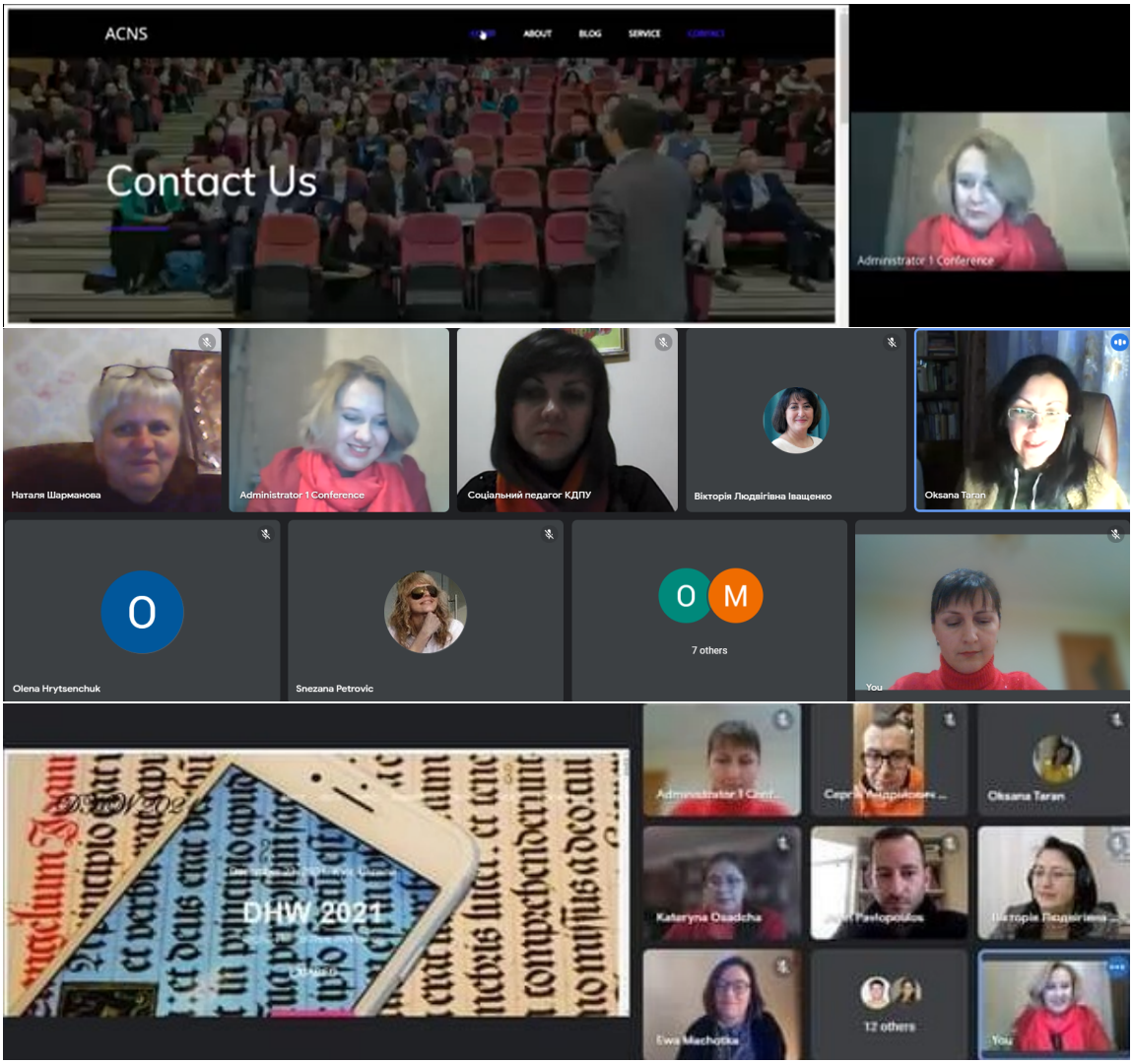


Figure 26: Blended workshop in uneven times.

Nechypurenko, Svitlana V. Shokaliuk, Natalia V. Moiseienko and Dmytro S. Shepiliev (figure 25), the classification of immersive educational resources is theoretically substantiated, and the generalized model of a technique of designing immersive educational resources is developed.

4 DHW 2021: CONCLUSION

DHW 2021 workshop would not have been possible without the support of many people. We would like to thank all the authors who submitted papers to our workshop and thus demonstrated their interest in the research problems within our scope. We are also very grateful to the members of our Program Committees for providing timely and thorough reviews and being cooperative in doing additional review work. We would like to thank the local organizers of the workshop, and the technical support team for their valuable service and help. Special thanks go to the Academy of Cognitive and Natural Sciences (ACNS, https://acnsci.org) whose financial and technical contributions enabled the materialization of this instance of the workshop. All these people, their devotion, energy, and efficiency, made our workshop a very interesting and effective scientific forum.

We are thankful to all the authors who submitted papers and the delegates for their participation and their interest in AREdu as a platform to share their ideas and innovation. Also, we are also thankful to all the program committee members for providing continuous guidance and efforts taken by peer reviewers contributed to improve the quality of papers provided constructive critical comments, improvements and corrections to the authors are gratefully appreciated for their contribution to the success of the workshop. Moreover, we would like to thank the developers of HotCRP, who made it possible for us to use the resources of this excellent and comprehensive conference management system, from the call of papers

and inviting reviewers, to handling paper submissions, communicating with the authors, and creating the volume of the workshop proceedings.

We are looking forward to excellent presentations and fruitful discussions, which will broaden the digital humanities event horizon. We hope all participants enjoy this workshop and meet again in more peaceful, friendly, hilarious, and happiness of further DHW 2022.

ACKNOWLEDGMENTS

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REFERENCES

[1] 2008. *Global Trends 2025: A Transformed World.* Technical Report NIC 2008-003. National Intelligence Council. https://www.files.ethz.ch/isn/94769/2008_11_global_trends_2025.pdf

[2] 2012. *Global Trends 2030: Alternative Worlds.* Technical Report NIC 2012-001. National Intelligence Council. https://www.dni.gov/files/documents/GlobalTrends_2030.pdf

[3] 2021. *Global Trends 2040: A More Connected World.* Technical Report NIC 2021-02339. National Intelligence Council. https://www.dni.gov/files/ODNI/documents/assessments/GlobalTrends_2040.pdf

[4] Lenka Bajčetić, Marija Gmitrović, Ana Španović, and Snežana Petrović. 2022. Digitization of the Serbian folk proverbs compiled by Vuk S. Karadžić. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 7 pages. https://doi.org/10.1145/3526242.3526265

[5] Oksana Buinytska, Liliia Varchenko-Trotsenko, Tetiana Terletska, and Anastasiia Tiutiunnyk. 2022. Utilization of E-Learning System for Innovative Methods Implementation in Humanities Pedagogy. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 9 pages. https://doi.org/10.1145/3526242.3526262

[6] Marita Chatzipanagiotou, Ewa Machotka, and John Pavlopoulos. 2022. Automated Recognition of Geographical Named Entities in Titles of Ukiyo-e Prints. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 7 pages. https://doi.org/10.1145/3526242.3526254

[7] Ihor O. Drahushchak, Oksana S. Taran, Svitlana P. Bybyk, Olesya V. Saban, and Natalia M. Sharmanova. 2022. Software for Measuring Linguistic Literacy Rate of Students (Based on Comments Written in Ukrainian). In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 7 pages. https://doi.org/10.1145/3526242.3526248

[8] Maria Fasoi, John Pavlopoulos, and Maria Konstantinidou. 2022. Computational Authorship Analysis of Homeric Language. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 11 pages. https://doi.org/10.1145/3526242.3526256

[9] Olena O. Hrytsenchuk and Sergii I. Trubachev. 2022. Creation and Development of the Digital Learning Environment in Educational Institutions. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 5 pages. https://doi.org/10.1145/3526242.3526257

[10] Victoria Ivashchenko, Vladyslav Yaskevych, and Daria Ivashchenko. 2022. "Lexical Minimum of Media Scientist": Reference Learning Edition as an Educational E-Resource. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 8 pages. https://doi.org/10.1145/3526242.3526247

[11] Olena Kuzminska, Nataliia Morze, Liliia Varchenko-Trotsenko, Maria Boiko, and Mariia Prokopchuk. 2022. Digital Competence of Future Researchers: Empirical Research of PhD Students of Ukrainian University. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 8 pages. https://doi.org/10.1145/3526242.3526258

[12] Rusudan Makhachashvili, Anna Bakhtina, Ivan Semenist, Ganna Prihodko, and Olexandra Prykhodchenko. 2022. Emoji Explication in Digital Communication: Logical-Phenomenological Experiment. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 7 pages. https://doi.org/10.1145/3526242.3526259

[13] Rusudan Makhachashvili, Ivan Semenist, Yurii Zatsnyi, and Olga Klymenko. 2022. Digital Interoperability of Foreign Languages Education. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 10 pages. https://doi.org/10.1145/3526242.3526251

[14] Nataliia Morze, Rusudan Makhachashvili, Gvantsa Mosiashvili, and Ingrid Pappel. 2022. Educating Future Digital Leaders: Developing e-Governance Curriculum in Estonia and Ukraine. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 6 pages. https://doi.org/10.1145/3526242.3526253

[15] Nataliia Morze, Rusudan Makhachashvili, Liliia Varchenko-Trotsenko, and Liliia Hrynevych. 2022. Digital Formats of Learning Outcomes Assessment in the COVID-19 Paradigm: Survey Study. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 7 pages. https://doi.org/10.1145/3526242.3526252

[16] Tetiana Opryshko and Serhii Nazarovets. 2022. Case Study: Citizen Science in Digital Humanities context. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 6 pages. https://doi.org/10.1145/3526242.3526246

[17] Kateryna P. Osadcha, Viacheslav V. Osadchyi, Vladyslav S. Kruglyk, and Oleg M. Spirin. 2022. Digital Drawing and Painting in the Training of Bachelors of Professional Education: Experience of Blended Learning. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 7 pages. https://doi.org/10.1145/3526242.3526245

[18] Serhiy O. Semerikov, Tetiana A. Vakaliuk, Iryna S. Mintii, Vita A. Hamaniuk, Vladimir N. Soloviev, Olga V. Bondarenko, Pavlo P. Nechypurenko, Svitlana V. Shokaliuk, Natalia V. Moiseienko, and Vitalii R. Ruban. 2022. Mask and Emotion: Computer Vision in the Age of COVID-19. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 25 pages. https://doi.org/10.1145/3526242.3526263

[19] Serhiy O. Semerikov, Tetiana A. Vakaliuk, Iryna S. Mintii, Vita A. Hamaniuk, Vladimir N. Soloviev, Olga V. Bondarenko, Pavlo P. Nechypurenko, Svitlana V. Shokaliuk, Natalia V. Moiseienko, and Dmytro S. Shepiliev. 2022. Immersive E-Learning Resources: Design Methods. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 11 pages. https://doi.org/10.1145/3526242.3526264

[20] David Pearce Snyder. 2004. Five Meta Trends: Changing the World. *The Futurist* 38, 4 (2004), 22–27. https://www.proquest.com/openview/abf293163dff883843f72179d8b74034/1?pq-origsite=gscholar&cbl=47758

[21] Oleg M. Spirin, Olga V. Matviienko, Svitlana M. Ivanova, Oksana V. Ovcharuk, Iryna S. Mintii, Iryna V. Ivaniuk, and Liliia A. Luparenko. 2022. The Use of Open Electronic Scientific and Educational Systems to Support the Professional Activities of Research and Teaching Staff of Ukrainian Universities and Scientific Institutions. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 8 pages. https://doi.org/10.1145/3526242.3526261

[22] Oksana S. Taran, Oleksandra S. Palchevska, Alla A. Luchyk, Viktoriia V. Shabunina, and Oksana V. Labenko. 2022. Stylometric Study of the Fiction Using Sketch Engine. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 7 pages. https://doi.org/10.1145/3526242.3526249

[23] Tetiana A. Vakaliuk, Galyna V. Marchuk, Vitalii L. Levkivskyi, Anastasiia M. Morgun, and Dmytro V. Kuznietsov. 2022. Development of AR Application to Promote the Historical Past of the Native Land. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 7 pages. https://doi.org/10.1145/3526242.3526244

[24] Tamara G. Vasyliuk, Ilia O. Lysokon, and Iya M. Shimko. 2022. Digital Educational Environment of a Modern University: Theory, Practice and Administration. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 8 pages. https://doi.org/10.1145/3526242.3526260

[25] Nataliia M. Vinnikova, Olena S. Aleksandrova, Olga M. Kuzmenko, Tetiana S. Opryshko, and Anastasiia S. Karpenko. 2022. Use of Digital Tools for Checking Uniqueness by Students and Academic Staff of the Borys Grinchenko Kyiv University: Problems and Solutions. In *Digital Humanities Workshop (DHW 2021), December 23, 2021, Kyiv, Ukraine* (Kyiv, Ukraine) *(DHW '21)*. Association for Computing Machinery, New York, NY, USA, 8 pages. https://doi.org/10.1145/3526242.3526250