

# Fostering Transdisciplinary Digital Institutional Leadership in Higher Education during Wartime

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## ABSTRACT

In times of war and crisis, higher education institutions (HEIs) face unprecedented challenges requiring transdisciplinary adaptability, resilience, and innovative leadership. Digital transformation plays a crucial role in sustaining transdisciplinary academic processes, institutional governance, and crisis management.

This study aims to examine the transdisciplinary strategies deployed by Ukrainian universities, in navigating wartime impediments while fostering digital institutional leadership, ensuring academic sustainability, and strengthening governance frameworks.

Drawing from the Universities' experience in educational leadership, strategic management, and crisis adaptation, the study explores digital governance, AI-enhanced institutional resilience, and leadership frameworks rooted in servant leadership philosophy. The paper highlights key institutional responses, including the integration of digitalized administrative workflows, crisis management systems, and AI-powered strategic decision-making to support academic operations during wartime uncertainty.

Applied trans-disciplinary lens contributes to the solution of holistic modeling of processes and results of updating models and mechanisms of the highly dynamic communication system of education in the digital environment as a whole and its individual formats in the emergency digitization measures of different types.

**Keywords:** Transdisciplinary Skills, Leadership Skills, Interoperable Skills, Digital Skills, Digital Educational Communication, Digital Leadership.

## 1. INTRODUCTION

Dynamic transformation of the knowledge economy, development of Industry 4.0/5.0 and elaboration 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 university level education, curriculum design and learning outcomes.

The global pandemic and, later, warfare in Ukraine induced amplified digitalization measures in the higher education sphere. This end-to end digital shift in the educational processes (communication, content, outcomes and outputs, skills) heralded the introduction of meta-disciplinary dimensions of learning – digital, hybrid and, blended. These trans-disciplinary dimensions can be considered conduits of vertical (endocentric) and horizontal (exocentric) transdisciplinary of digital education as a communicative system.

Applied trans-disciplinary lens of the phenomenological approach contributes to the solution of holistic modeling of processes and results of updating models and mechanisms of the highly dynamic communication system of education in the digital environment as a whole and its individual formats at the beginning of the XXI century in particular.

As a product of modern civilization, the digital reality has become an independent format of being. Accordingly, electronic media act not only as a means of transmitting information, but also reveal their own world-creating, meaning-making and, as a consequence, language-forming and communicative potential [46; 48; 50]. The global digital realm stands as an integral environment, demanding new cognition and perception ways via complex philosophic, cultural, social, linguistic approaches, providing unlimited opportunities for human intellect, language development and research.

Given the conceptual system of identification of onto-mental and linguo-mental complex formations to identify constructs of reality, the global digital realm (cyberspace) and its innovative communicative shell can be located in the transdisciplinary coordinates of such paradigms: 1) philosophy - as a *particular type of substance* – material and ideal reality in the multitude of

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its forms; a meta-negentropy (the term after Nagib Callaos [6]); 2) anthropology – as an environment for actualization of post-humanistic forms of anthropogenesis; 3) psychology – as psychosomatic and emotional plane of a personality functioning; 4) sociology – as a system of multi-tiered and multi-directional social and communicative relations; 5) in culturology – as a sphere of spiritual experience, 6) in the theory of communication – as a system of multilevel, multidirectional social relations and communicative interaction.

*Transdisciplinary communication in the global digital realm* is, therefore, understood as an integrated at the macro and micro level set of cross-sectorial verbal referents, innovations and innovative communication practices and technologies, which by their specific characteristics are conditionally exhaustive phenomenological correlates of transdisciplinary elements of the digital environment.

The innovative nature of communication in the field of learning and education (formal and informal) in the global digital environment is determined by the phenomenological consolidation of substantive (ontological, pre-suppositional / cognitive [52]) characteristics of the macrostructure of communication in statics and end-to-end dynamic interaction of formal and semantic constituents and technological (digital) tools. The paradigm of innovation of educational communication in the digital realm (as a multidimensional, complex, dynamic system) is defined as the most comprehensive quantitative and qualitative terms of linguo-cognitive actualization of being, determined by a number of qualifying conditions of its emergence, existence and development. The inquiry results allow to provide a transdisciplinary synthesis of educational communication paradigm across communicative theory, information theory, philosophy, education and e-learning studies, semiotics, digital humanities.

Theoretical problems of holistic, transdimensional modeling of reality and its separate spheres are directed by the deterministic interaction of objects, signs of their reception and interpretation (in the field of individual and collective consciousness), embodiment, consolidation and retransmission of the results of interaction of these systems of features.

Conditions for the development of modern globalization civilization determine the expansion and refinement of the paradigm of views on the theoretical principles of determining the groundwork and characteristics of the consolidation of the world order, its perception in culture, collective social consciousness and natural language.

The transdisciplinarity of innovative educational communication in this respect is accessed through is the conceptual lens of the **logosphere**, synthetically perceived as 1) the plurality of language units, which are conditionally exhaustive phenomenological realizations of abstract and empirical elements of different spheres of life [4; 23]; 2) the zone of integration of thought, speech, and experience continuums of cultures [5; 16; 26]; 3) the plurality of culturally relevant universal meanings and signs – **semiosphere** [27; 51]; 4) a plurality of transcendent spiritual meanings – **pneumatosphere** [14].

Foreign Languages Acquisition on university-level major programs is a rigorous process that involves different stages and a regimen of communicative educational activities, communication types and competences across interconnected domains [24; 25]. Transdisciplinarity and ubiquity (universality) of innovative communication for Foreign Languages Education (ARTS AND HUMANITIES) in the 21<sup>st</sup> century, therefore, is informed, in crucial ways, by intellectualization and amplified information capacity of human activities in general. Thus, the

intellectualization of modern global culture determines a qualitatively new approach to understanding the processes of parallel development of human activities, cognitive (intellectual), and communicative experiences. That is the origin and methodological premise of the concept of "noosphere". Noosphere is the unity of "nature" and culture, especially from the moment when the intellectual culture reaches (by force of influence on the biosphere and geosphere) the power of a peculiar "geological force" [40].

The noosphere is defined as the current stage of development of the biosphere, associated with the emergence of humanity in it [16; 40], and is interpreted as part of the planet and planet ambient with traces of human activity.

The integral real component of the Noosphere is identified as the Technosphere – a set of artificial objects (technologies) created by the humankind, and natural objects changed as a result of technological activity of humankind [28]. In turn, Computer Being (computer reality, cyberspace) is a complex, multidimensional sphere of synthesis of reality, human experience and activity mediated by the latest digital and information technologies; technogenic reality, a component of the technosphere of existence [17; 28].

Therefore, it is stipulated in **the study design**, that the cognitive and ontological (framework) premise of *transdisciplinary educational communication in the digital realm* (TECDR) is informed by the following **dimensions**: 1) the *metadisciplinary dimension* of ECDR, disclosed through the mutual transformative potential of information and modern technology, as "knowledge in a scientific sense can lag only slightly behind this world transformation because knowledge becomes transformed in the process" [17]; 2) the *universal dimension* of TECDR, disclosed through the pervasive, ubiquitous nature of humanitarian and linguistic (especially multi-cultural) knowledge applicability, as "science and technology revolutionize our lives, but memory, tradition and myth frame our response" [32]; 3) the *interoperable dimension* of TECDR, informed by the underlying anthropocentrism of linguistic knowledge and skills, providing the interface for development and application of skills and activities across different domains, as "a human is a nexus of existential horizons" [22].

The result of a fundamental Technosphere shift in the sphere of Education, induced by the COVID-19 pandemic development and enhanced by wartime iterative digitalization measures, was the need to take quick comprehensive action [29; 36] in order to achieve such desirable results: in order to achieve such desirable results: a) To activate comprehensive transdisciplinary domains and corresponding interdisciplinary skillsets, otherwise latent or underutilized in the educational process; b) To enhance the scope of communication skills beyond the domains traditionally reserved for Arts and Humanities education; c) To boost information and communication technological competence and digital literacy, to meet the requirements of (post)COVID-19 job market and workplace; d) to introduce digital meta-solutions for facilitation of formal and informal educational workflow and communication.

The context of the erupted military intervention in Ukraine and the ensuing information warfare in various digital ambient (social media, news coverage, digital communications) has ascribed the specific value to the enhanced role of leadership skills in digital communication as a tool of the internationally broadcast strife for freedom and sovereignty.

In times of war and crisis, higher education institutions (HEIs) face unprecedented challenges requiring transdisciplinary adaptability, resilience, and innovative leadership. Digital transformation plays a crucial role in sustaining transdisciplinary

academic processes, institutional governance, and crisis management.

This study **objective** is to examine the transdisciplinary strategies deployed by Borys Grinchenko Kyiv Metropolitan University (BGKMU) and Zaporizhzhia National University (ZNU), Ukraine, in navigating wartime disruptions while fostering digital institutional leadership, ensuring academic continuity, and strengthening governance frameworks.

Drawing from the Universities' experience in educational leadership, strategic management, and crisis adaptation, the study explores digital governance, AI-enhanced institutional resilience, and leadership frameworks rooted in servant leadership philosophy. The paper highlights key institutional responses, including the integration of digitalized administrative workflows, crisis management systems, and AI-powered strategic decision-making to support academic operations during wartime uncertainty.

The study of groundwork principles of universality and transdisciplinary of educational communication in professional linguistic training and linguistic education in general is a parcel of the framework project *TRANSITION: Transformation, Network, Society and Education* [28; 29; 30].

## 2. FINDINGS

### Transdisciplinarity in Digital Institutional Leadership

The following grid of groundwork concepts is applied to profile the Innovative Communication for Arts and Humanities Education (ARTS AND HUMANITIES) in such disciplinary dimensions:

- TRANSDISCIPLINARITY
- TRANSCENDENCE
- METADISCIPLINARITY
- SUSTAINABILITY
- INTEROPERABILITY
- SYNERGY
- DIGITAL INSTITUTIONAL LEADERSHIP

The emergency and sustainable digitalization changes in the higher education sphere heralded the introduction of pervasive dimensions of learning - digital, hybrid and, blended. These dimensions can be considered the 3T coordinates ambient of digital education: **transformation, transcendence, transdisciplinarity**. These dimensions are conduits of vertical (endocentric) and horizontal (exocentric) transdisciplinarity of digital education as a cohesive system

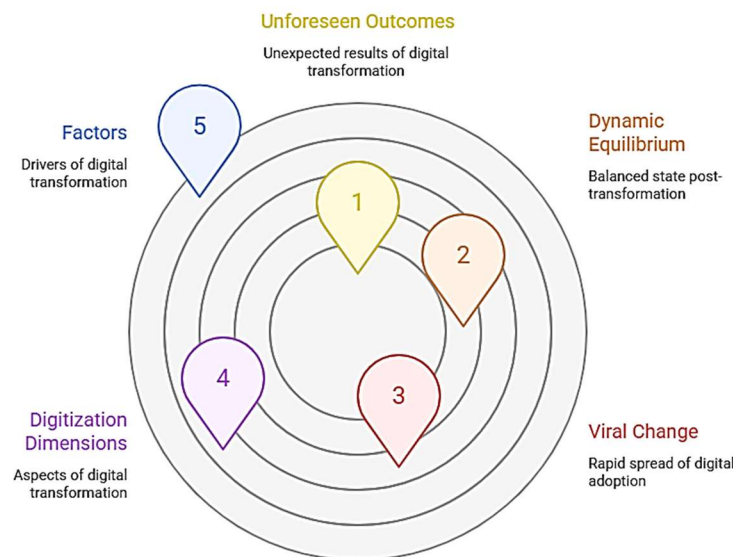


Figure 1: 3T Model for Digital Transformation

The meaning of TRANSDISCIPLINARITY is synthesized for the purpose of this study as a transcendent agglomeration of two or more fields of knowledge into one scope/goal of study, inquiry or activity [6; 15; 18; 21].

UNIVERSALITY is generally understood as a property of object or state to “**exist everywhere (ubiquity), or involve everyone**” [7]. In the context of this study we suggest to attribute the property of universality/ubiquity to social activity, vocational activity and professional performance.

The concept of INTEROPERABILITY is disclosed across different approaches [20; 34] as a characteristic of an object, product or system, that allows its interface to be comprehensible, to work with other objects, products or systems.

CATASTROPHE THEORY [25] is a branch of bifurcation theory in the study of dynamical systems. Small changes in certain parameters of a nonlinear system can cause equilibria to

appear or disappear, or to change from attracting to repelling and vice versa, leading to large and sudden changes of the behavior of the system.

SYNERGETICS is the empirical study of systems in transformation, with an emphasis on whole system behaviors unpredicted by the behavior of any components in isolation [31]. As applied to transdisciplinary communication in digital education, the concept of interoperability represents the property of functional, dynamic interconnectivity between the source and target domains of linguistic content, linguistic theory content, related areas of scientific and universal knowledge, and domains of professional and social application. Degrees of interoperability help define the measure of interdisciplinary transcendence and universality of activities, skills and competence applications of ARTS AND HUMANITIES stakeholders.

## Transformative Framework of Digital Educational Communication and Leadership

The dimensions of transformation of digital education fall into two categories: SUSTAINABLE AND EMERGENCY (Fig. 2).

SUSTAINABLE TRANSFORMATION:

- post-pandemic
- sustainable development

EMERGENCY TRANSFORMATION:

- war
- natural disasters
- pandemic.

The generic concept of multiple disciplinarity [1; 38] comprises, in its turn, of a framework of interconnected concepts: Multi-disciplinarity; Interdisciplinarity; Transdisciplinarity; Metadisciplinarity.

**Multi-disciplinarity**, thus, is understood as a multitude of fields of knowledge, that comprise the scope of understanding a certain object, problem or area of inquiry.

**Interdisciplinarity** in this respect is interpreted as the interconnectivity of multiple spheres of knowledge that comprised the content of a problem or area of inquiry.

**Trans-disciplinarity**, subsequently, is perceived as a transcendent product of merging multiple interconnected knowledge domains.

*Transdisciplinarity of digital educational communication in general* is, therefore, postulated in this study as a computational framework of interconnected types of disciplinarity.

**Meta-disciplinarity** of digital educational communication is determined through the digital ambient, content and tools of its implementation. The digital meta-dimension becomes the source of systemic structuring of innovative educational communication on macro- and micro-levels.

Multidisciplinary **input** into the education design and content in the form of data, information and facts across different source domains of human knowledge in order 1) to constitute the thematic content of language acquisition; 2) to constitute the semantic referents of linguistic units; 3) to constitute the vast framework of reference and contexts for communicative application.

Interdisciplinary connections of the educational **content** for Arts and Humanities – internal interconnectivity of theoretical and applied disciplines, external interconnectivity of study content

with non-related areas of human knowledge (computer science, physiology, anthropology, philosophy etc.).

Transdisciplinary **output** in the transcendent nature target knowledge domains and universal applicability of skills, training and outlook of the ARTS AND HUMANITIES professionals upon graduation.

Therefore, the framework correspondence of relevant complex skills constitutes a TRANSDISCIPLINARY META-FRAMEWORK of educational communication.

Interoperability for soft and leadership skills ensured by the communicative nature of interdisciplinary skills. The core cross-sectorial domain that is referential for primary skills (social skills, emotional intellect, collaboration, communication, ICT-literacy), necessary for educational goals achievement, is COMMUNICATION.

The digital dimension of communicative interoperability of ARTS AND HUMANITIES stems from the structure of Noosphere [40] and content of its components: ANTHROPOSPHERE - a set of people as living organisms, their activities and achievements; SOCIOSPHERE - a set of social factors characteristic of this stage of society development and its interaction with nature; TECHNOSPHERE - a set of artificial objects created by man, and natural objects, altered as a result of human activity.

Given the nature of increasingly digitalized context of foreign languages education and communicative application ("the Technospheric shift" [30]), it is suggested to consider the different types of information source and information destination (human and machine/computer/program, accordingly) in the structure of the groundwork Communication model (Cf. Claude Shannon [33]), when communication is approached as the core factor of interoperability of source and target knowledge and application domains in ARTS AND HUMANITIES.

Thus, the fundamental transdisciplinarity, that the post-pandemic digital procedural transformations imposed on the educational process in the area of Foreign languages acquisition, is verified by a unified framework of correspondence between the components of a crucial communicative competence [19], comprising of a diverse skillset, and various aspects of ICT competence in Arts and Humanities [3; 12; 13; 39], utilized in the educational process, elaborated for the purposes of this study.

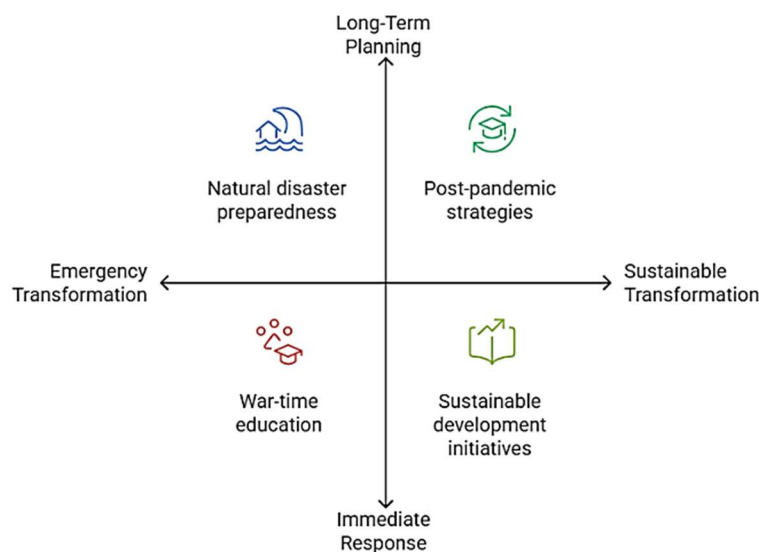


Figure 2: Transformation Grid for Digital Education

The SYSTEMIC TRANSFORMATION CATALISTS for education, therefore, would fall into the following categories:

1) ATTRACTOR:

- Technological advances
- Accessibility
- Time/expense
- Accommodation

2) REPELLER:

- Black swans
- Crisis
- War
- Calamity

Taking into account the nature of suggested modelling of educational communication across frameworks of complex skills, it is stipulated that *META-disciplinarity* has become the universal vehicle or framework of education in the digital realm, whereas *TRANS-disciplinarity* can be perceived as a universal output of educational communication in the digital realm.

Consequently, the communicative dimension of education proper in the post-pandemic timeframe acquires a meta-digital and trans-digital (transcendent digital) properties. The trans-digital characteristics of educational communication is ensured through the interoperability of such framework parameters as:

- Interaction,
- Disciplinarity
- Learning
- Leadership

Effective digital leadership frameworks in Higher Education encompass institutional governance, financial sustainability, academic continuity, personnel management, and stakeholder engagement. The strategies outlined by BGKMU, for instance, involve:

- Strategic Digital Governance: Ensuring transparency, accountability, and adaptability in institutional management through digital tools and AI-enhanced analytics.
- Crisis-Responsive Decision-Making: Implementing real-time digital monitoring systems to address security risks, operational disruptions, and infrastructural challenges caused by wartime conditions.
- Educational Continuity Models: Deploying remote learning platforms, AI-driven curriculum adaptation, and digital faculty development programs to sustain academic quality.
- Digital Workforce Management: Leveraging AI-supported personnel assessment, virtual collaboration tools, and adaptive work strategies to ensure administrative effectiveness.

BGKMU institutional strategy (2023-2027), which aligns with European digital governance principles and UN Sustainable Development Goals, demonstrates how digital infrastructures fortify academic resilience and leadership adaptability during crises. The University commitment to servant leadership in higher education further strengthens institutional cohesion, reinforcing ethical and community-driven leadership models.

Artificial Intelligence (AI) plays a transformative role as a **transdisciplinary agent** of support for HEI governance and crisis adaptation. AI-driven analytics enable predictive modeling for risk assessment, aiding universities in safeguarding operations amid wartime uncertainty.

BGKMU has actively integrated AI into:

- Strategic planning and institutional forecasting – AI-assisted modeling of crisis impact scenarios, ensuring efficient resource allocation for academic survival.

- Digital governance and documentation automation – Implementation of electronic document management systems to reduce bureaucratic delays and streamline administrative workflows.
- AI-enhanced leadership competency development – Training academic managers in AI-powered decision-making processes to enhance institutional agility.
- Cybersecurity resilience measures – Strengthening data protection frameworks to secure academic and financial records against cyber threats.

Alternatively, located close to the frontline of the warzone in Ukraine, ZNU has pioneered a decentralized innovation ecosystem, comprising interdisciplinary digital laboratories for AI and virtual reality. These laboratories act as autonomous research and technology hubs, supporting HEI sustainability during wartime.

- Core components of ZNU's decentralized ecosystem include:
- Creation of digital twins for cultural heritage – preserving historical sites via 3D modeling and virtual tours;
- AI-powered anomaly detection in government procurement – supporting public-sector transparency through machine-learning frameworks;
- Development of rehabilitation simulators – assisting medical recovery for patients with movement impairments and chronic pain;
- Emotion recognition technologies – advancing AI-driven analysis of human speech and facial expressions;
- Hazard detection systems in conflict zones – utilizing AI-enhanced recognition models to identify dangerous objects in battlefields.
- This scalable innovation framework enables ZNU to integrate advanced AI technologies into interdisciplinary applications, supporting both academic research and public-sector resilience during wartime crises.

These applications highlight the role of AI-enhanced digital leadership in reinforcing institutional durability, workforce flexibility, and cross-sector engagement, ensuring that HEIs remain functional in crisis environments.

### Transdisciplinary Institutional Leadership in Digital Educational Communication

The identified interdisciplinary communicative dimensions of the digital education allowed to single out integrated trends in digital education development in the pandemic and warfare timeframe.

#### *Trend 1: TRANSFORMATION OF COMMUNICATION FORMATS IN DIGITAL EDUCATION.*

Types of digital education formats, on the rise globally through the emergency digitization measures are determined as follows: E-LEARNING 1.0 - direct synchronous computer-assisted distant instruction; E-LEARNING 2.0 [43] - mostly asynchronous computer-supported collaborative learning; E-LEARNING 3.0 [35] - AI-assisted digital or hybrid learning; BLENDED LEARNING [46; 5; 11] - in-person teaching with asynchronous ICT assisted learning methods; HYBRID LEARNING [13] - synchronous instruction of in-presence and remote students via digital tools.

Modelling of the comprehensive framework of educational activities and experiences in Liberal Arts transformation into digitally enhanced format [32] is, therefore, possible through an interoperable set of parameters: Time; Space; Communicative

distance; Dependence on ICT tools and infrastructure. The level of communicative complexity of digital education format is proportionately dependent on the technological enhancement involved and counter-proportionally dependent on the communicative distance of the digital learning format.

The sub-trend 1.1 includes replication of *non-digital components* or creating *simulacra* in educational communication: learning space digital recreation; learning ritual/scenarios recreation; measurable learning outcomes recreation; learning interaction recreation.



Figure 3: Evolution of Emergency E-Learning Formats

This way, the mobile learning (m-learning) acquires features of ubiquitous learning in the lockdown perimeters. Ubiquitous learning adjusts from a space-centric model to a time-centric model due to time-zone discrepancies in digital educational communication and becomes w-learning (whenever-learning).

*Trend 2: TRANSFORMATION OF CONTENT IN DIGITAL EDUCATION.* This trend heralds the observable shift from human-originated to digital content in education.

The sub-trend 2.1 is manifested through the development of an interdisciplinary paradigm of digital humanities – a diverse, open for augmentation, 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 pedagogy; Digital sociology; Digital music etc.

The sub-trend 2.2 is manifested through the emergence and implementation of the “born digital” formats in education. Born digital dimensions in digital education include: Born digital LEARNING OBJECTS; Born digital LEARNING SCENARIOS; Born digital LEARNING OUTCOMES; Born digital ASSESSMENT.

The primary result of these transformations in the nature of the educational content is interdisciplinarity as a fundamental endgame of digital education.

Interdisciplinary social domains most accommodating or lucrative for liberal arts education are estimated as follows: Private sector (business); Public sector (civil service, public education, state social sector, etc.); Foreign economic activity; Industry; IT sector; Law/ legislature; Agriculture; Volunteering; Finance. According to the data of the online survey, conducted as a parcel of the project ‘TRANSITION’, led by the authorial team, the highest average scoring transdisciplinary domains of education in the Liberal Arts application are the Private business sector (77%), Public service sector (68.65%) and Foreign economy sector (58.62%). IT sector is estimated among top 5 domains (48.5%).

*Trend 3: TRANSFORMATION OF STAKEHOLDERS IN DIGITAL EDUCATIONAL COMMUNICATION.* This trend is manifested, primarily, through the ambidirectional shifts in human to machine interaction in education. The subsequent result is the introduction of Artificial Intelligence solutions in

The sub-trend 1.2 elaboration of authentic or self-aware components of digital communication, such as Flipped digital classroom; Inquiry-based digital learning; Digitally enhanced peer-assessment; Collaborative (networked) learning.

Transformative communicative model of digital education facilitates the identification evolution directions of e-learning formats, informed by the space-time constraints of the global quarantine measures and wartime measures (Fig. 3).

education as an alternative form of educational communication subjects – from limited in scope and complexity to sophisticated and communicatively independent: Chat-bots; Gamification of educational tasks; AI Teacher Assistant (LMS); AI learning companion; Educational robots.

AI enhancement of the learning stakeholders and communicative components informs transformations in other components of educational communication, namely the elaboration of machine learning powered mixed reality [28] learning environments and content, such as: AUGMENTED REALITY; VIRTUAL REALITY; ANNOTATED REALITY; 3D PRINTING, AI LEARNING AGENTS.

For the multidisciplinary OUTPUT of Liberal Arts digital education dominant is the identified need to both interdisciplinary **upskill** in related humanities/Liberal Arts disciplines and cross-sectorially **reskill** in a technical/computer science field, which is consistent with the identified trend content and interaction transformation in the pandemic timespan and with the transdisciplinary understanding of Arts and Humanities education in general.

### 3. CONCLUSIONS

The pandemic and wartime induced amplified digitalization measures in the higher education sphere. This end-to end digital shift in the educational processes (communication, content, outcomes and outputs, skills) heralded the introduction of meta-disciplinary dimensions of learning – digital, hybrid and, blended. These meta-disciplinary dimensions can be considered conduits of vertical (endocentric) and horizontal (exocentric) transdisciplinary of digital education as a communicative system. Applied trans-disciplinary lens contributes to the solution of holistic modeling of processes and results of updating models and mechanisms of the highly dynamic communication system of education in the digital environment as a whole and its individual formats in the emergency digitization measures of different types. The study findings are pertinent to the assessment of leadership and leadership-interoperable skills, crucial for successful professional development overall; systematization and assessment of educational communication skills, enhanced by the leadership curriculum design through emergency digitization;

core professional values a leadership-based education can help actualize; social spheres estimated most accommodating or lucrative for a leadership-based education skillset; leadership curriculum informed employment options and projected career paths for in Ukraine through the wartime emergency and beyond. Beyond digital adaptation, wartime HEIs must proactively restructure leadership models, financial sustainability frameworks, and global collaborations to maintain long-term viability. BGKMU and ZNU international engagement in Horizon Europe, Erasmus+, and COST Action initiatives has provided avenues for integrating global best practices in crisis management into Ukraine higher education sector: inter-institutional cooperation: Establishing strategic alliances with European universities to share crisis adaptation methodologies and digital learning innovations; funding resilience strategies: Securing grants and financial support for wartime educational continuity through digital campus development and cross-border academic partnerships; sustainable faculty development models: Implementing remote faculty training to strengthen academic expertise in digital transformation and international collaboration; student engagement and digital inclusion: Ensuring accessibility of digital learning platforms for students displaced by conflict, supporting war-affected academic communities.

Both BGKMU and ZNU in different regions of the warzone exemplify scalable transdisciplinary strategies for digital institutional leadership, demonstrating how AI-powered infrastructures support adaptive higher education governance in crisis environments: cross-institutional and cross-sectorial collaboration models – fostering knowledge-sharing between HEIs through joint AI initiatives; AI-enhanced resilience frameworks – refining predictive institutional modeling for **long-term** recovery planning; decentralized and servant leadership integration – ensuring that innovation ecosystems align with multi-sector institutional needs.

These models set a precedent for future digital institutional leadership in HEIs facing uncertainty, war, and technological transformation.

By integrating leadership agility, digital adaptability, and cross-sector collaboration, HEIs can navigate wartime complexities, ensuring institutional sustainability and educational accessibility. Higher education in wartime necessitates visionary leadership, digital adaptability, and AI-driven institutional governance. BGKMU and ZNU experience exemplifies how HEIs can sustain operations, engage in global academic networks, and strengthen institutional resilience through AI-enhanced digital leadership frameworks. The study advocates for a transdisciplinary approach to crisis management, urging universities to embrace digital leadership innovations to ensure academic continuity and institutional sustainability amid global uncertainty.

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