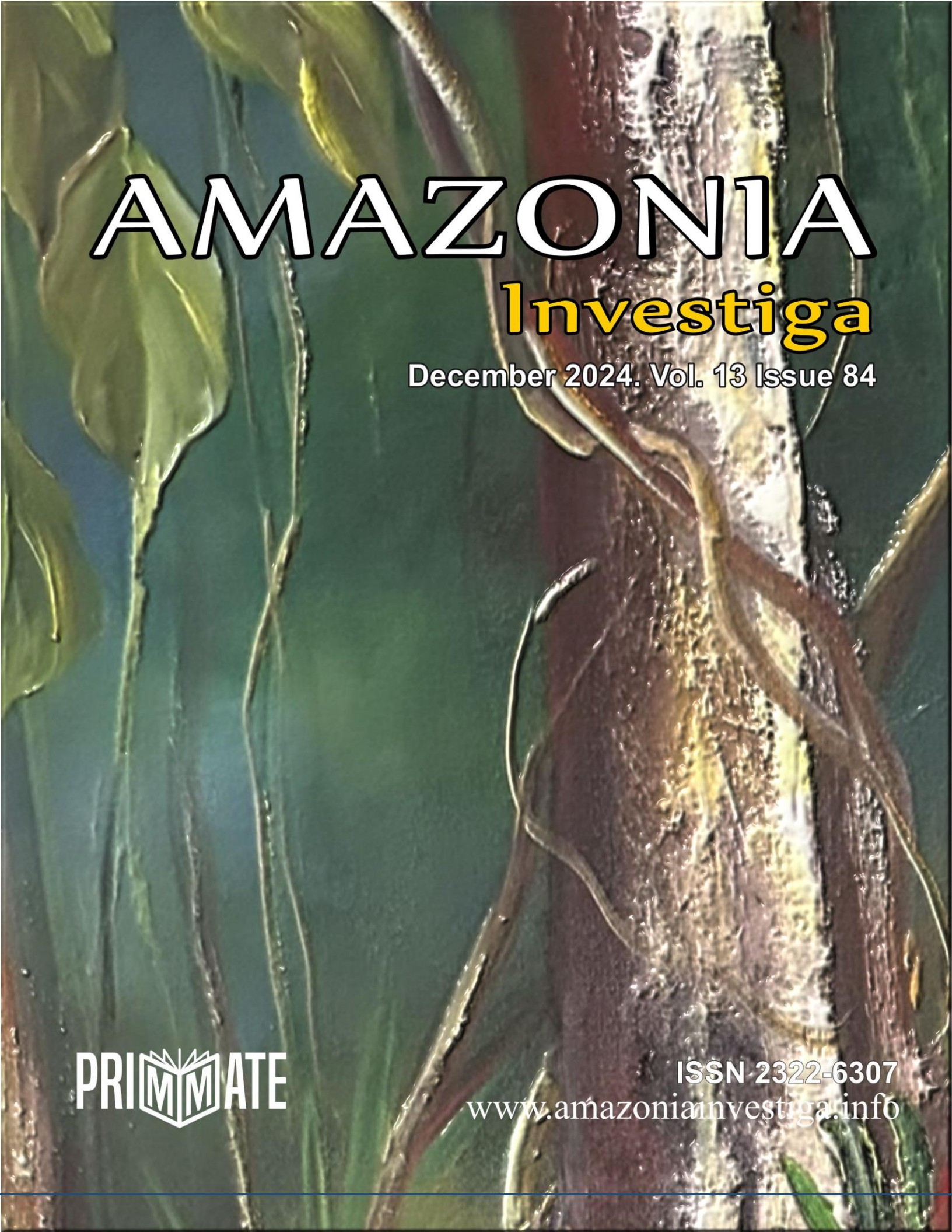




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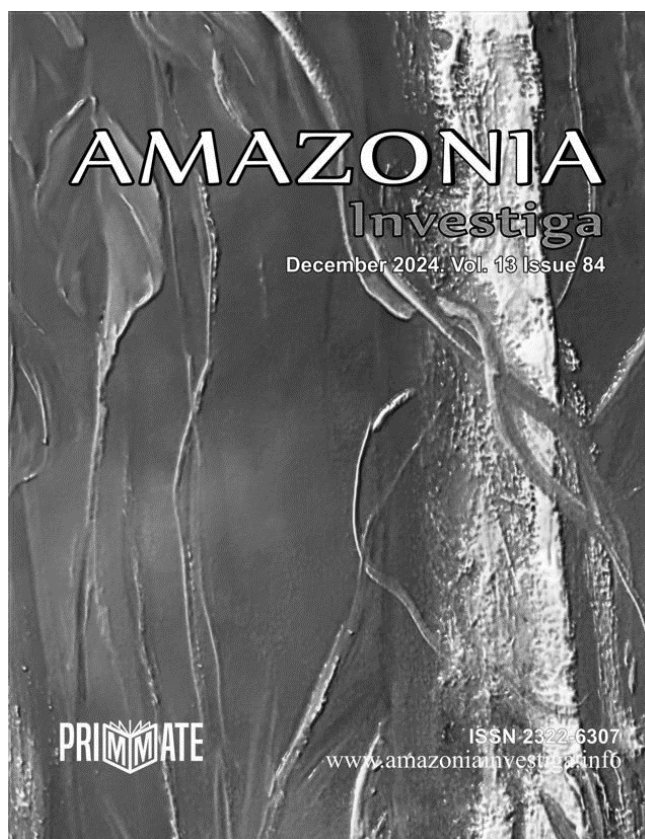
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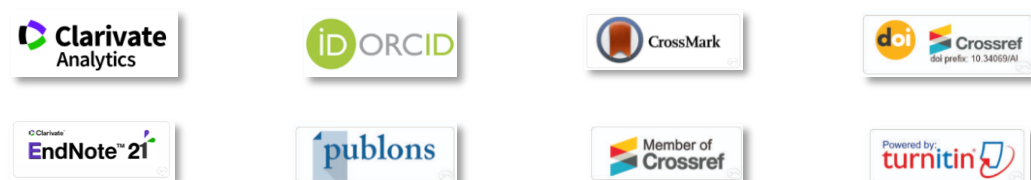
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Development of a strategic roadmap for plasma technology in Thailand: The hub of talents initiative

การพัฒนาแผนยุทธศาสตร์สำหรับเทคโนโลยีพลาสมาในประเทศไทย: โครงการศูนย์กลางผู้เชี่ยวชาญ

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Abstract

This paper presents the development process and results of a strategic roadmap for plasma technology in Thailand, as part of the Hub of Talents for Plasma Technology initiative. Through a comprehensive methodology including literature review, expert interviews, workshops, and stakeholder consultations, a 5-year roadmap was created to guide research, development, and application of plasma technology in the country. The roadmap identifies six priority areas: research and development in plasma science and technology, industrial applications, upskilling existing talent, capacity building for new talent, networking, and ecosystem development. Key projects are outlined across these priority areas to drive implementation. This strategic planning aims to position Thailand as a leader in plasma technology expertise in the ASEAN region. The roadmap provides a framework to align research

บทคัดย่อ

บทความนี้นำเสนอกระบวนการพัฒนาและผลลัพธ์ของแผนที่นำทางเชิงกลยุทธ์สำหรับเทคโนโลยีพลาสมาในประเทศไทย ซึ่งเป็นส่วนหนึ่งของโครงการศูนย์กลางบุคลากรที่มีความสามารถด้านเทคโนโลยีพลาสมา ผ่านระเบียบวิธีวิจัยที่ครอบคลุม ซึ่งประกอบด้วย การทบทวนวรรณกรรม การสัมภาษณ์ผู้เชี่ยวชาญ การจัดประชุมเชิงปฏิบัติการ และการหารือกับผู้มีส่วนได้ส่วนเสีย จึงได้มีการจัดทำแผนที่นำทางระยะ 5 ปี เพื่อเป็นแนวทางในการวิจัยพัฒนา และประยุกต์ใช้เทคโนโลยีพลาสมาในประเทศ แผนที่นำทางนี้ระบุพื้นที่สำคัญ 6 ด้าน ได้แก่ การวิจัยและพัฒนาด้านวิทยาศาสตร์และเทคโนโลยีพลาสมา การประยุกต์ใช้ในภาคอุตสาหกรรม การยกระดับทักษะบุคลากรที่มีอยู่ การสร้างขีดความสามารถสำหรับบุคลากรใหม่ การสร้างเครือข่าย และการพัฒนาระบบนิเวศ โดยมีการวางโครงการสำคัญครอบคลุมทุกพื้นที่เพื่อขับเคลื่อนการดำเนินงาน การวางแผนเชิงกลยุทธ์นี้มีเป้าหมายเพื่อวางตำแหน่งประเทศไทยให้เป็นผู้นำด้านความเชี่ยวชาญเทคโนโลยีพลาสมาในภูมิภาคอาเซียน แผนที่นำทางนี้ให้กรอบการดำเนินงานเพื่อจัดแนวทางการวิจัย

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efforts, strengthen industry collaboration, develop human capital, and create an enabling ecosystem for plasma technology innovation in Thailand.

Keywords: strategic roadmap, plasma technology, hub of talents, Thailand research and development.

เสริมสร้างความร่วมมือกับภาคอุตสาหกรรม พัฒนาทุนมนุษย์
และสร้างระบบนิเวศที่เอื้อต่อนวัตกรรมเทคโนโลยีพลาสมาในประเทศไทย

คำสำคัญ: แผนยุทธศาสตร์; เทคโนโลยีพลาสมา; ศูนย์กลางผู้เชี่ยวชาญ;
การวิจัยและพัฒนาของประเทศไทย.

Introduction

Plasma technology has emerged as a versatile and promising field with applications spanning diverse sectors including materials processing, energy, medicine, agriculture, and environmental remediation (Chu & Lu, 2013). As the fourth state of matter, plasma offers unique properties that enable novel industrial processes and solutions to pressing societal challenges (Adamovich et al., 2017). The ability of plasma to generate highly reactive species, produce high-energy electrons, and create intense electromagnetic fields has opened up new possibilities for technological innovation across multiple disciplines.

In materials processing, plasma technologies are revolutionizing surface modification techniques, enabling the creation of advanced coatings with properties tailored for specific applications. The semiconductor industry, in particular, has heavily relied on plasma-based processes for etching and deposition in the fabrication of microelectronic devices. In the energy sector, plasma research holds promise for fusion energy development, as well as improving the efficiency of conventional power generation through plasma-assisted combustion.

The medical field has seen growing interest in plasma applications, ranging from sterilization of medical equipment to direct therapeutic use in wound healing and cancer treatment (Chutsirimongkol et al., 2016).

In agriculture, cold plasma treatments are being explored for seed germination enhancement, pest control, and food preservation. Environmental applications of plasma technology include water treatment, air pollution control, and waste management, offering potentially more efficient and environmentally friendly alternatives to conventional methods.

Recognizing the strategic importance of this technology, many countries have launched initiatives to develop expertise and capabilities in plasma science and engineering (Batani et al., 2023). These efforts often involve significant public investment in research infrastructure, human capital development, and industry-academia collaborations. For instance, the European Union has established a comprehensive roadmap for fusion energy research, while countries like South Korea and Japan have implemented national strategies to promote plasma technology across various industrial sectors.

In Thailand, efforts to advance plasma technology research and development have been growing in recent years, with several universities and research institutes establishing dedicated plasma laboratories and programs (Chutsirimongkol et al., 2016; Buaruk et al., 2019). Notable developments include the establishment of specialized research facilities, growing research output in areas such as agricultural applications of plasma, and the recent launch of Thailand's first tokamak fusion experiment (Laoharojanaphand et al., 2016).

However, these efforts have been largely fragmented, lacking coordination and a unified strategic direction at the national level. The absence of a comprehensive strategy has led to potential duplication of efforts, missed opportunities for synergies, and challenges in translating research outcomes into industrial applications. Furthermore, the development of human capital in plasma science and engineering has not kept pace with the growing demand from both academia and industry.

To address these gaps and capitalize on Thailand's existing strengths in plasma technology, the Hub of Talents for Plasma Technology initiative was launched in 2023 as a collaborative platform to bring together expertise from academia, industry, and government. This initiative aims to create a coordinated ecosystem for plasma technology development in Thailand, fostering innovation, enhancing human capital, and strengthening the country's competitiveness in this emerging field.

A key objective of this initiative is to develop a strategic roadmap to guide plasma technology development in Thailand over the next 5 years. This roadmap aims to align research priorities, strengthen industry-academia collaboration, develop human capital, and create an enabling ecosystem for plasma technology innovation. By setting clear goals and outlining specific actions, the roadmap seeks to accelerate the development and adoption of plasma technologies in key sectors of the Thai economy. The ultimate vision is to position Thailand as a leader in plasma technology expertise within the ASEAN region, contributing to the country's technological advancement and economic competitiveness.

This paper presents the systematic process undertaken to develop this strategic roadmap, including the methodology, key findings, and resulting roadmap framework. By documenting this process, we aim to provide insights that may be valuable for similar strategic planning efforts in other emerging technology fields or national contexts. The paper is structured as follows: Section 2 provides an overview of strategic technology roadmapping and reviews existing plasma technology roadmaps from other countries. Section 3 details the methodology used in developing the Thai roadmap, including literature review, expert interviews, and stakeholder workshops. Section 4 presents the key elements of the resulting roadmap, including vision, objectives, priority areas, and implementation plan. Finally, Sections 5 and 6 discuss the implications of the roadmap and conclude with reflections on its potential impact and future research directions.

Literature review or theoretical framework

The literature review for this study covers three main areas: strategic technology roadmapping as a planning tool, plasma technology roadmaps, and the development of roadmaps for emerging technologies.

Strategic Technology Roadmapping

Technology roadmapping has emerged as a widely used foresight and strategic planning tool to support innovation management and policy (Phaal et al., 2004). Roadmaps provide a structured visual representation of the evolution of technologies, products, and markets over time, helping to align technological capabilities with business or policy objectives (Kostoff & Schaller, 2001; Ramingwong et al., 2024).

The process of roadmapping typically involves bringing together diverse stakeholders to develop a shared vision and action plan (Phaal & Muller, 2009). Key benefits include improved communication across functional silos, identification of gaps in R&D programs, and prioritization of investments (Amer & Daim, 2010). While initially developed for corporate technology planning, roadmapping has been increasingly adopted at industry and national levels to guide science and technology policy (Li et al., 2015).

Plasma Technology Roadmaps

2022 Plasma Roadmap, representing a diverse group of leading experts in the field of low-temperature plasma science and technology, have identified several notable examples of plasma technology roadmaps developed by various countries and regions. These roadmaps provide valuable insights into the strategic priorities and development trajectories for plasma science and technology around the world (Adamovich et al., 2022).

Several countries and regions have developed roadmaps specifically focused on plasma technology development. Notable examples include the roadmap for fusion energy development by US Department of Energy's Fusion Energy Sciences Advisory Committee (Carter et al., 2020), the roadmap to realize fusion energy by 2050 by the European Union's EURO fusion consortium (Nordlund, 2018). These roadmaps share common elements such as identifying priority research directions, outlining infrastructure and human resource development needs, and defining timelines for key technology milestones. However, they also reflect the specific national contexts, existing capabilities, and strategic priorities of each country or region.

Roadmaps in Other Emerging Technologies

The development of strategic roadmaps has been crucial for guiding various emerging technologies. In the field of quantum technologies, roadmaps have been instrumental in directing research and development efforts in quantum computing, communication, and nanotechnology applications. These roadmaps

highlight how quantum phenomena can revolutionize computing, communication, and nanoscale exploration while identifying key challenges in translating laboratory discoveries into practical applications (Laucht et al., 2021).

In flexible electronics and sensors, comprehensive roadmaps have addressed critical challenges in commercialization and market adoption. These roadmaps emphasize key factors such as dimensional scaling, functional performance, and mechanical compliance while considering environmental concerns and ethical implications. Strategic planning in this sector has helped align research efforts across disparate communities and accelerate scientific breakthroughs (Luo et al., 2023).

The intersection of information technology and biotechnology presents another crucial area where roadmapping has proven valuable. Recent roadmaps in this domain focus on addressing environmental challenges through sustainable practices, outlining short-term, medium-term, and long-term goals while considering technical, financial, and ethical barriers. These roadmaps emphasize the importance of cross-industry collaboration and the role of various stakeholders in fostering sustainable growth (Asimiyu, 2024).

Common themes across these roadmaps include integration of sustainability considerations, focus on stakeholder engagement and collaboration, emphasis on translating research into practical applications, address of ethical and regulatory challenges, development of human capital and infrastructure. These examples from other emerging technology fields offer valuable insights for plasma technology roadmap development, particularly in areas such as stakeholder engagement and consensus-building, integration of research and industrial applications, human capital development strategies, infrastructure and facility planning and policy and regulatory frameworks.

Plasma Technology Development in Thailand

Research on plasma technology in Thailand dates back to the 2000s, with initial focus areas including materials processing and environmental applications (Tippayawong & Khongkrapan, 2009). Key milestones include the establishment of the Plasma and Beam Physics Research Facility at Chiang Mai University in 1998, which became a center for low-temperature plasma research, the launch of Thailand's first tokamak fusion experiment, Thailand Tokamak-1, at the Thailand Institute of Nuclear Technology in 2020 (Wisitsorasak et al., 2024) and the growing research on agricultural and food applications of plasma technology at several Thai universities (Sarinont et al., 2016).

While these developments demonstrate Thailand's growing capabilities in plasma technology, the research landscape remains fragmented. A comprehensive national roadmap could help align efforts and accelerate progress in priority areas.

Government Policy and Private Sector Demand in Thailand

The development of plasma technology in Thailand has been influenced by both government policies and growing private sector demand. Key government agencies have recognized plasma technology's potential and implemented supportive policies. The Ministry of Higher Education, Science, Research and Innovation included plasma technology in its National Science, Technology, and Innovation Policy and Plan (2021-2027) as a key enabling technology (MHESI, 2021). The Thailand Institute of Nuclear Technology prioritized plasma and fusion research, establishing the Thailand Tokamak-1 facility (Laoharajanaphand et al., 2016). The National Science and Technology Development Agency has supported plasma technology research through various funding programs (NSTDA, 2022), while the Board of Investment included plasma-based manufacturing processes in its investment promotion list. In the private sector, demand for plasma technology applications has grown across several industries. The electronics manufacturing sector has shown interest in plasma-based processes for surface modification and thin film deposition (Wiboonsak et al., 2018). The food and agriculture sector is exploring cold plasma technology for food preservation and agricultural applications (Ruamrungsri et al., 2023). The medical device industry is investigating plasma sterilization technologies (Chutsirimongkol et al., 2016), while textile manufacturers are exploring plasma treatment for fabric modification (Wongsawaeng et al., 2017). Environmental applications of plasma technology are also gaining attention (Quyen et al., 2017). Despite this growing interest, adoption of plasma technologies in Thai industry remains limited compared to more advanced economies, facing challenges such as high investment costs, lack of skilled personnel, and limited awareness among smaller enterprises. This review highlights the need for coordinated efforts to bridge the

gap between research capabilities and industrial application, insights that shaped the development of the Hub of Talents Plasma Technology Roadmap.

Methodology

The development of the Hub of Talents Plasma Technology Roadmap followed a multi-stage process combining desk research, expert consultation, and stakeholder engagement. The key stages were:

Literature Review and Environmental Scanning

An extensive review of academic and grey literature was conducted to understand the global state-of-the-art in plasma technology, identify emerging trends and applications, and analyze existing roadmaps from other countries. This review covered both scientific publications and policy documents.

Bibliometric analysis was performed using the Scopus database to map Thailand's research output in plasma technology and identify key institutions and researchers. This analysis helped benchmark Thailand's capabilities against leading countries in the field.

Bibliometric Process

1. **Database Selection:** The Scopus database was selected for this bibliometric analysis due to its comprehensive coverage of scientific literature in the field of plasma technology. Scopus is one of the largest abstracts and citation databases of peer-reviewed literature, covering scientific journals, books, and conference proceedings.
2. **Time Frame:** The analysis covered publications from January 1, 1962 to December 31, 2023. This extensive time frame was chosen to capture the full evolution of plasma technology research, from its early developments to the most recent advancements.
3. **Search Strategy:** A search query was constructed to identify relevant publications:

TITLE-ABS-KEY ("Plasma Technology")

This query searched for the term "Plasma Technology" in the title, abstract, and keywords of publications.

1. **Data Extraction:** The following data were extracted for each publication, i.e., publication year, authors, affiliations, countries, document type, subject areas, citations and keywords.
2. **Data Cleaning:** The extracted data was cleaned to remove duplicates and correct any inconsistencies in author names or affiliations.
3. **Analysis Tools:** Several tools were used for the bibliometric analysis:
 - VOSviewer: For creating co-authorship, co-occurrence, and collaboration network visualizations.
 - Bibliometrix R-package: For generating bibliometric indicators and trend analyses.
 - Microsoft Excel: For basic data manipulation and chart creation.
4. **Bibliometric Indicators:** Key bibliometric indicators calculated included:
 - Publication output over time.
 - Top contributing countries and institutions.
 - Most productive authors.
 - Most cited papers.
 - Subject area distribution.
 - Collaboration patterns.
5. **Visualization:** Various visualizations were created to represent the bibliometric data:
 - Time series plots of publication trends.
 - Co-authorship networks.
 - Keyword co-occurrence networks.
 - Country collaboration networks.

- TreeMap of subject areas.
- Focus on Thailand:** A specific analysis was conducted focusing on Thailand's research output, identifying key institutions, researchers, and collaboration patterns within the country.

Bibliometric Results Summary

The bibliometric analysis revealed a total of 3,934 documents related to plasma technology published between 1962 and 2023. The analysis showed an increasing trend in publications over time, with a significant acceleration in recent years (see Figures 1-3).

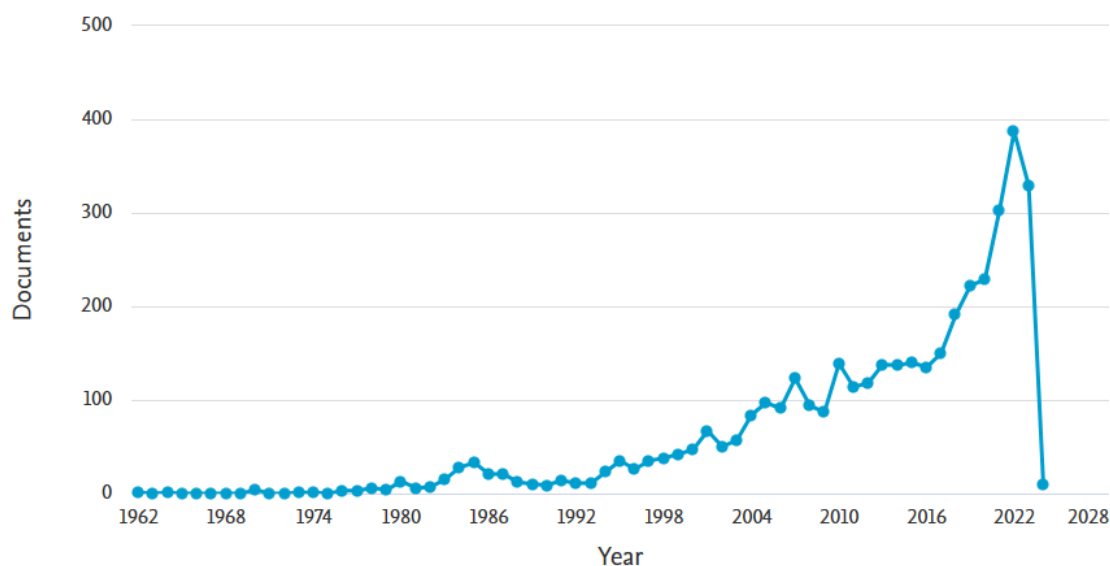


Figure 1. Publication on plasma technology.
Note: own authorship

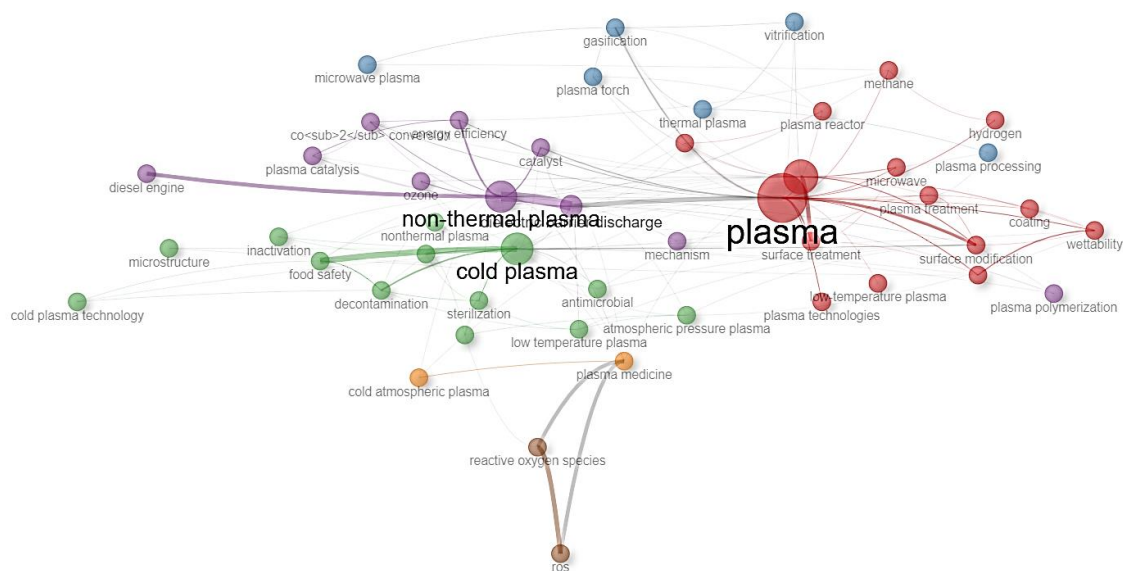


Figure 2. Co-occurrence Network on plasma technology.
Note: Created by author using bibliometrix R-package

Figure 2 displays a network visualization of key terms and concepts in plasma technology research. The largest node, "plasma", sits at the center, indicating its central role in this field. Branching out from it are various related concepts and applications, such as "non-thermal plasma" and "cold plasma". This network structure illustrates the diverse and interconnected nature of plasma technology research, spanning multiple

subfields and applications. The different colors likely represent distinct clusters or subdomains within plasma research, showcasing how various aspects of the technology are interconnected yet form their own specialized areas of study.

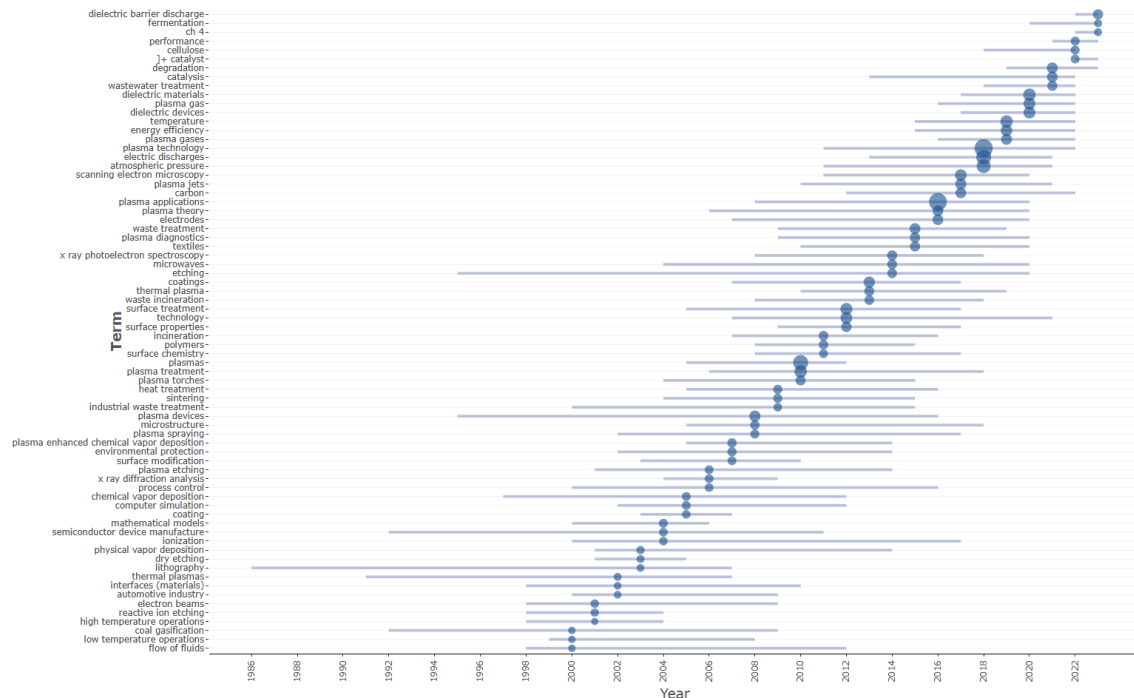


Figure 3. Trend Topics on plasma technology.
Note: Created by author using bibliometrix R-package

Figure 3 presents a timeline of research output in plasma technology, with each row representing a specific topic or keyword and the blue dots indicating publication activity over time. The increasing density of blue dots towards the right side of the chart clearly demonstrates the growing research interest and output in plasma technology over recent years. This visualization effectively captures the evolution of the field, showing which topics have been consistently studied over time and which ones have emerged more recently. The varying lengths of the rows also suggest differences in the longevity and intensity of research focus on different aspects of plasma technology.

Based on Scopus database, China has emerged as the leading country in terms of publication output, followed by the United States, Russia, Germany, and India, reflecting a shift in the global research landscape. Notably, Thailand has secured the 22nd position globally in plasma technology research output, indicating its growing presence in this advanced scientific field.

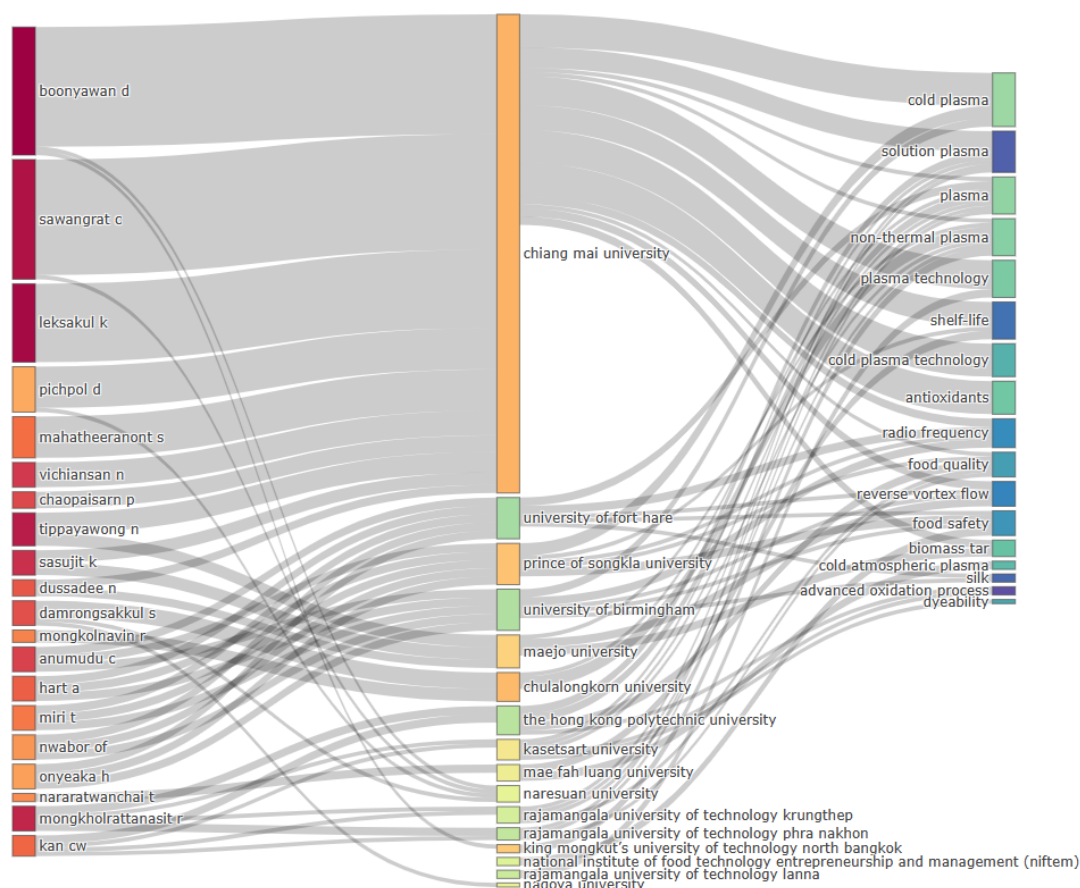


Figure 4. Three-Field Plot on plasma technology in Thailand.

Note: Created by author using bibliometrix R-package

The analysis of Thailand's research landscape reveals significant progress, with key institutions such as Chiang Mai University and the Thailand Institute of Nuclear Technology playing pivotal roles. Several other universities in Thailand are also contributing substantially to the field, as evidenced by Figures 4-6 in the roadmap. This positioning of Thailand in the global plasma technology research arena underscores the country's increasing investment in science and technology, particularly in cutting-edge fields. The growth in research output suggests a strategic focus on developing stronger capabilities in plasma technology, likely driven by factors such as increased funding, development of specialized research facilities, and international collaborations. Thailand's performance not only highlights its potential for further growth and impact in plasma technology but also indicates a broader trend of Southeast Asian countries increasing their presence in advanced scientific fields. This shift in the research landscape emphasizes the increasingly global nature of plasma technology research and underscores the importance of international collaboration in advancing the field.



Figure 5. Collaboration Network – Institutions on plasma technology in Thailand
Note: Created by author using bibliometrix R-package

This collaboration network visualization (Figure 5) provides valuable insights into the landscape of plasma technology research in Thailand. The network structure reveals a complex web of institutional collaborations, with one central institution serving as a major hub for research and partnerships. This central node's prominence suggests it plays a key role in driving plasma technology research and fostering collaborations across the country.

Surrounding this central hub are several distinct clusters of institutions, indicating the formation of specialized research groups or regional collaborations. These clusters likely represent focused efforts on specific aspects of plasma technology or applications in particular industries. The varying sizes of nodes and the density of connections between them illustrate the different scales of research activity and the intensity of collaborations among institutions.

However, the network also highlights some challenges in the research ecosystem. Several smaller clusters and individual nodes appear relatively isolated from the main network, suggesting there are institutions or research groups working on plasma technology with limited connection to the broader national research community. These isolated groups may represent untapped potential for knowledge sharing and collaboration that could enhance the overall research output and innovation in plasma technology across Thailand.



Figure 6. TreeMap on plasma technology in Thailand.

Note: Created by author using bibliometrix R-package

This bibliometric approach provided a comprehensive overview of the global and Thai research landscape in plasma technology, informing the roadmap development process by identifying strengths, trends, and potential collaboration opportunities.

Expert Interviews

In-depth interviews were conducted with more than 10 leading plasma technology researchers, including both Thai experts and internationally renowned scientists, representing key universities and research institutes. These semi-structured interviews explored:

- Current research focus areas and capabilities.
- Perceived strengths and weaknesses of Thailand's plasma technology ecosystem.
- Priority application areas for Thailand.
- Key challenges and enablers for advancing plasma technology in the country.
- Vision for Thailand's position in plasma technology by 2030.

The interviews were recorded, transcribed, and analyzed using thematic coding to identify common themes and priorities.

Stakeholder Workshops

The roadmap development process included two key stakeholder workshops. The first workshop brought together 74 participants to review preliminary findings from the literature review and expert interviews. Through facilitated discussions and group exercises, participants validated and refined the vision statement for the Hub of Talents initiative, identified priority research areas and applications for Thailand, and proposed potential projects and initiatives to advance plasma technology. A second workshop involved 50 participants and focused on developing the structure and content of the roadmap. Activities included defining key milestones and timelines for priority research areas, mapping required infrastructure and human resource development, and identifying potential funding sources and policy support needed. Both workshops employed participatory methods such as small group discussions, plenary sessions, and voting exercises to build consensus around roadmap priorities. This collaborative approach ensured that the resulting roadmap reflected a broad range of stakeholder perspectives and priorities.

Roadmap Development and Validation

Based on inputs from the literature review, expert interviews, and stakeholder workshops, a draft roadmap was developed by the core project team. This draft was then circulated to key stakeholders for feedback and refinement through an iterative process.

A final validation workshop was later held to review and approve the roadmap structure, content, and implementation plan. This ensured broad stakeholder buy-in for the final roadmap.

Results and discussion.

The resulting roadmap provides a strategic framework to guide plasma technology development in Thailand over the next 5 years (2024-2028). Key elements of the roadmap are presented below.

Vision and Objectives

Vision

"Thailand as the ASEAN hub for high-level talent in plasma technology"

Objectives

1. To create a collaborative network of plasma technology experts, positioning Thailand as a leader in the field within ASEAN.
2. To drive the application of plasma technology to address key national and regional challenges.
3. To promote and stimulate greater utilization of plasma technology in Thailand and ASEAN.
4. To elevate the role and visibility of Thai plasma technology research and innovation internationally.

Priority Areas and Projects

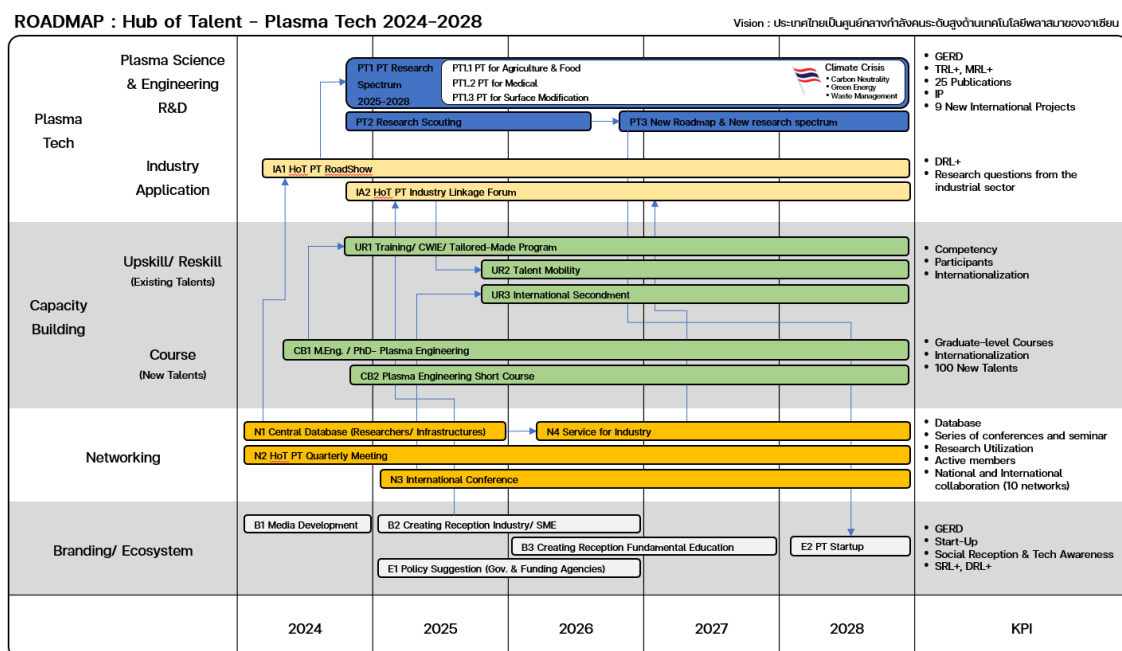


Figure 7. Thailand hub of talents - plasma technology roadmap.

Note: Created by author

The roadmap (see Figure 7.) is structured around six interconnected priority areas, each with specific projects and initiatives:

(PT) Plasma Science and Technology R&D

PT1: Elevating research across the plasma technology spectrum (see Figure 8.)

- Aims to enhance research capabilities across different plasma technology applications.
- Includes funding support for research projects and equipment upgrades.
- Focuses on agriculture, medicine, and surface modification applications.

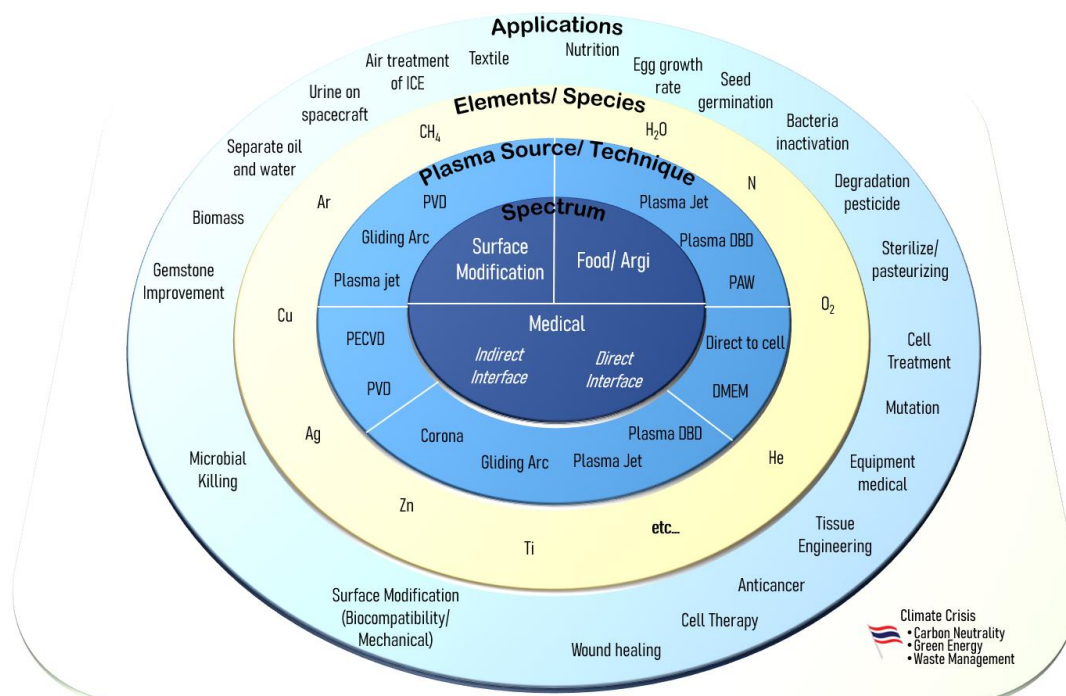


Figure 8. Thailand hub of talent - plasma technology spectrum mapping.

Note: Created by author

PT2: Future technology exploration and scanning

- Involves systematic monitoring of emerging plasma technologies globally.
- Includes scenario planning workshops to identify promising future directions.
- Aims to keep Thailand at the forefront of plasma technology developments.

PT3: Roadmap development and new research spectrum identification

- Periodic review and updating of the plasma technology roadmap.
- Identification of new research areas based on global trends and local strengths.
- Ensures alignment of research priorities with national needs and capabilities.

(IA) Industrial Applications

IA1: Hub of Talent Roadshow

- Mobile exhibitions and seminars to showcase plasma technology applications.
- Targets industrial clusters across Thailand to raise awareness.
- Includes live demonstrations of plasma technology equipment.

IA2: Industry Forum

- Regular meetings between researchers and industry representatives.

- Platform for discussing industry needs and research capabilities.
- Aims to foster collaborative R&D projects.

(UR) Upskilling/Reskilling of Existing Talent

UR1: Training programs / Cooperative and Work-Integrated Education

- Short courses and workshops for industry professionals on plasma technology.
- Cooperative education programs placing students in industry for hands-on experience.
- Aims to bridge the gap between academic knowledge and practical skills.

UR2: Talent Mobility to Industry

- Program to place academic researchers in industry for short-term projects.
- Facilitates knowledge transfer and practical application of research.
- Helps align academic research with industry needs.

UR3: International Talent Mobility

- Exchange programs with leading international plasma technology institutions.
- Includes both outgoing Thai researchers and incoming foreign experts.
- Aims to elevate Thai expertise to international standards.

(CB) Capacity Building for New Talents

CB1: Development of graduate programs in plasma technology

- Establishment of specialized Master's and PhD programs in plasma science and engineering.
- Curriculum development in collaboration with industry partners.
- Aims to create a pipeline of highly skilled plasma technology specialists.

CB2: Development of short courses in plasma technology

- Modular, intensive courses on specific plasma technology applications.
- Targets both students and working professionals.
- Flexible delivery including online and blended learning options.

(N) Networking

N1: Database of research, researchers, and infrastructure

- Comprehensive online database of plasma technology resources in Thailand.
- Includes researcher profiles, publications, patents, and available equipment.
- Facilitates collaboration and efficient use of resources.

N2: Quarterly meetings of Hub of Talent

- Regular gatherings of plasma technology researchers and stakeholders.
- Includes research presentations, discussions, and networking opportunities.
- Aims to foster a strong community of practice in plasma technology.

N3: International conferences and workshops

- Hosting of international plasma technology conferences in Thailand.
- Organization of specialized workshops with leading global experts.
- Positions Thailand as a key player in the international plasma technology community.

N4: Development of service platform for industry

- Online platform connecting industry with plasma technology expertise and services
- Includes equipment booking, consulting services, and collaborative project matching
- Aims to lower barriers for industry adoption of plasma technology

(BE) Branding and Ecosystem Development

B1: Development of promotional media

- Creation of high-quality multimedia content showcasing Thai plasma technology capabilities.
- Includes videos, infographics, and interactive online materials.
- Targets both domestic and international audiences.

B2: Raising awareness in industry

- Targeted campaigns to educate specific industry sectors on plasma technology applications.
- Includes case studies, ROI analyses, and sector-specific demonstrations.
- Aims to drive adoption of plasma technology in Thai industries.

B3: Public awareness campaigns

- General public outreach to build understanding and support for plasma technology.
- Includes school programs, science museum exhibitions, and media partnerships.
- Aims to inspire the next generation of plasma technology researchers and innovators.

E1: Policy recommendations and research funding proposals

Development of evidence-based policy briefs for government stakeholders

- Preparation of funding proposals for large-scale plasma technology initiatives.
- Aims to create a supportive policy and funding environment for plasma technology development.

E2: Plasma technology startups

- Incubator program for plasma technology startups.
- Provides mentoring, seed funding, and access to research infrastructure.
- Aims to commercialize plasma technology innovations and create new industries.

Key Performance Indicators

To track progress and impact, the roadmap includes the following key performance indicators (KPIs) to be achieved over the 5-year period:

- 25 publications in Q1-Q2 journals (Scopus or ISI indexed).
- 9 new international grant proposals submitted.
- 3 new graduate programs focused on plasma technology.
- 15 faculty/researchers collaborating with industry annually.
- 100 new researchers/engineers/technicians/innovators trained.
- 10 new national and international network partnerships established.
- 2 cases of shared use of plasma research infrastructure in year 1.
- 2 follow-on research grants secured after project completion in year 1.
- 1 networking event (conference/seminar) organized in year 1.
- 1 billion THB economic impact from commercialization of plasma technology research by 2032.
- New plasma technology startups supported.

Implementation Timeline and Budget

The roadmap outlines a phased implementation approach over 5 years, with a total proposed budget of 160 million THB. Key phases include:

2024-2025: Establishing foundations

- Launch graduate programs and short courses.
- Develop researcher/infrastructure database.
- Initiate regular Hub of Talent meetings.

2025-2026: Expanding activities

- Begin industry engagement (roadshows, forums).
- Launch talent mobility programs.
- Organize international conferences.

2027-2028: Accelerating impact

- Conduct future technology scanning.
- Develop service platform for industry.
- Support plasma technology startups.

Discussion

The Hub of Talents Plasma Technology Roadmap represents a significant step towards coordinating and focusing Thailand's efforts in this emerging field. Several key aspects of the roadmap and its development process merit further discussion:

Balancing Basic and Applied Research

The roadmap aims to strike a balance between advancing fundamental plasma science and promoting industrial applications. This reflects the current state of plasma technology globally, where breakthroughs in basic understanding continue to enable new applications (Adamovich et al., 2017). For Thailand, maintaining strength in foundational research while accelerating technology transfer will be crucial to long-term competitiveness.

Human Capital Development Focus

A strong emphasis on human capital development is evident throughout the roadmap, from graduate programs to industry mobility schemes. This aligns with findings from other national plasma technology initiatives, which have identified skilled workforce development as a key enabler. The challenge will be ensuring that the skills developed match evolving industry needs.

Regional Positioning

The vision of becoming an ASEAN hub for plasma technology expertise is ambitious but potentially achievable given Thailand's existing research base. However, this will require careful positioning relative to other countries in the region investing in similar capabilities, such as Singapore and Malaysia. Cultivating unique strengths and fostering regional collaboration will be important strategies.

Implementation Challenges

While the roadmap provides a comprehensive framework, successful implementation will face several challenges:

- Securing sustained funding across multiple agencies and budget cycles.
- Maintaining stakeholder engagement and commitment over the 5-year period.

- Adapting to rapid technological changes and emerging application areas.
- Overcoming potential institutional silos and fostering genuine collaboration.

Addressing these challenges will require strong governance mechanisms and regular review and adjustment of the roadmap.

Implications of Priority Areas

The six priority areas identified in the roadmap have significant implications for Thailand's plasma technology development:

- **Plasma Science and Technology R&D (PT):** The emphasis on foundational research alongside industrial applications reflects a strategic balance crucial for long-term competitiveness. This dual focus could enable Thailand to both contribute to global plasma science advancement and develop locally relevant applications. However, success will require sustained funding and research infrastructure development.
- **Industrial Applications (IA):** The focus on industry engagement through roadshows and forums addresses a critical gap in technology transfer. These initiatives could accelerate the adoption of plasma technology in Thai industries, particularly in sectors like electronics and agriculture where Thailand has existing strengths. The success of these programs could directly impact economic outcomes and industry competitiveness.
- **Upskilling/Reskilling (UR):** The comprehensive approach to talent development, combining domestic training with international mobility, could create a multiplier effect in building Thailand's plasma technology capabilities. This could lead to the formation of a self-sustaining ecosystem of expertise, though careful attention must be paid to retention of trained personnel.
- **Capacity Building (CB):** The development of specialized graduate programs could establish Thailand as a regional education hub for plasma technology. This could have long-term implications for ASEAN regional leadership in this field, while addressing critical workforce needs.
- **Networking (N):** The emphasis on both domestic and international networking could position Thailand as a connector in the global plasma technology community. This could facilitate knowledge transfer and research collaboration, though maintaining active networks will require ongoing effort and resources.
- **Branding and Ecosystem Development (BE):** The focus on ecosystem development could help create a sustainable foundation for plasma technology innovation. However, success will depend on effective coordination among multiple stakeholders and sustained policy support.

Study Limitations

Several limitations of this study should be acknowledged:

- **Long-term Forecasting:** The rapid pace of technological change makes it challenging to predict plasma technology evolution beyond the 5-year timeframe, particularly in emerging application areas.
- **Resource Assumptions:** The roadmap's implementation relies on assumptions about available funding and resources that may need adjustment based on changing economic conditions.
- **Regional Context:** While the roadmap aims to position Thailand within ASEAN, input from regional stakeholders was limited, which may affect the comprehensiveness of regional considerations.
- **Implementation Challenges:** The study primarily focuses on strategic planning rather than detailed implementation mechanisms, which may need further development.

Conclusion

The Hub of Talents Plasma Technology Roadmap represents a pioneering initiative that goes beyond traditional technology roadmapping by integrating human capital development with technological advancement. This novel approach recognizes that sustainable technological leadership requires not just research and infrastructure, but also a robust talent ecosystem. By explicitly linking talent development to technological progress, the roadmap offers an innovative model that could be valuable for other emerging economies seeking to develop advanced technology capabilities.

The roadmap's unique contribution lies in several aspects. First, it demonstrates how a middle-income country can strategically position itself in an advanced technology field through careful alignment of research, industry, and human capital development. Second, it provides a framework for regional leadership that balances national capability building with international collaboration. Third, it introduces a comprehensive stakeholder engagement model that could be adapted for other technology development initiatives.

While the roadmap provides a strategic framework for the next five years, its impact could extend well beyond this timeframe and beyond Thailand's borders. The emphasis on creating self-sustaining ecosystems rather than just technological capabilities suggests potential long-term effects on Thailand's innovation capacity. Moreover, the roadmap's approach to building regional leadership through talent development rather than just technological advancement offers insights for other countries seeking to establish themselves in emerging technology fields.

Future Research Directions

Several important areas for future research emerge from this work:

- **Impact Assessment:** Longitudinal studies tracking the implementation and impact of the roadmap's various initiatives, particularly measuring the development of human capital and industry adoption of plasma technology.
- **Comparative Analysis:** Systematic comparison of this roadmap with plasma technology development strategies in other emerging economies, particularly examining different approaches to talent development and ecosystem building.
- **Policy Implementation:** Research into the effectiveness of various policy instruments and support mechanisms in promoting plasma technology development and adoption.
- **Regional Integration:** Studies examining how regional collaboration in plasma technology develops and its impact on ASEAN technological capabilities.
- **Ecosystem Development:** Investigation of the dynamics between various stakeholders in the plasma technology ecosystem and how these relationships evolve over time.

These future research directions could provide valuable insights for both policy makers and practitioners involved in technological development initiatives, while contributing to our understanding of how emerging economies can successfully develop capabilities in advanced technology fields.

The success of this roadmap will ultimately depend on sustained commitment from all stakeholders and effective coordination of various initiatives. However, by providing a comprehensive framework that addresses both technological and human capital aspects of development, it represents a significant step toward establishing Thailand as a leader in plasma technology within the ASEAN region. The approach taken here may also serve as a model for other countries seeking to develop capabilities in emerging technologies while building sustainable innovation ecosystems.

Acknowledgement

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Lifelong learning in the digital age: An analysis of online marketing communication strategies in slovak educational institutions

Celoživotné vzdelávanie v digitálnom veku: Analýza online marketingových komunikačných stratégií slovenských vzdelávacích inštitúcií

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Abstract

This paper explores the complex education process in modern society, emphasizing lifelong learning as critical for personal and professional development. Despite challenges such as market saturation with university graduates, lifelong learning—including professional and retraining courses—emerges as a solution for enhancing employability. However,

Abstrakt

Tento príspevok skúma komplexný vzdelávací proces v modernej spoločnosti, pričom zdôrazňuje, že celoživotné vzdelávanie je rozhodujúce pre osobný a profesionálny rozvoj. Napriek výzvam, ako je nasýtenie trhu absolventmi vysokých škôl, sa celoživotné vzdelávanie – vrátane odborných a rekvalifikačných kurzov – ukazuje ako riešenie na

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public awareness of its benefits remains limited, necessitating effective marketing communication to promote adult education. This paper analyses Slovak educational institutions' online platforms, mainly social media, for lifelong learning promotion. A mixed-method approach, incorporating institutional data and a survey of 633 Slovak participants, reveals a significant reliance on social media as an information source. Findings show that 81.67% of respondents obtain educational information online, with a strong preference for centralized profiles summarizing lifelong learning opportunities. Universities dominate as preferred providers, but untapped potential exists among secondary schools and language institutions. This study underscores the need for tailored digital marketing strategies in the educational sector, especially when targeting diverse demographic groups, including older adults. By leveraging social media and creating unified communication platforms, Slovak institutions can enhance lifelong learning engagement, addressing educational needs and societal demands.

Keywords: Lifelong Learning, Online Marketing Communication, Social Media Strategies, Adult Education, Slovak Educational Institutions.

zvýšenie zamestnateľnosti. Verejné povedomie o jeho výhodách však zostáva limitované, čo si vyžaduje účinnú marketingovú komunikáciu na podporu vzdelávania dospelých. Tento príspevok analyzuje online platformy slovenských vzdelávacích inštitúcií, najmä sociálne siete, na podporu celoživotného vzdelávania. Prieskum medzi 633 respondentmi zo Slovenska odhaľuje značnú závislosť od sociálnych sietí ako zdroja informácií. Zo zistení vyplýva, že 81,67 % respondentov získava informácie o vzdelávaní online, pričom silne preferujú centralizované profily sumarizujúce možnosti celoživotného vzdelávania. Univerzity dominujú ako preferovaní poskytovatelia, ale nevyužitý potenciál existuje medzi strednými školami a jazykovými školami. Prípevok podčiarkuje potrebu prispôbených stratégií digitálneho marketingu vo vzdelávacom sektore, najmä pri zacielení na rôzne demografické skupiny, vrátane starších ľudí. Využitím sociálnych sietí a vytvorením jednotných komunikačných platforiem môžu slovenské inštitúcie zvýšiť angažovanosť v oblasti celoživotného vzdelávania, riešiť vzdelávacie potreby a spoločenské požiadavky.

Kľúčové slová: Celoživotné vzdelávanie. Online marketingová komunikácia. Stratégie sociálnych médií. Vzdelávanie dospelých. Slovenské vzdelávacie inštitúcie.

Introduction

In an era of rapid technological advancements, shifting global dynamics, and ever-evolving industries, lifelong learning has become a cornerstone of personal and professional success. Unlike previous generations, where formal education often sufficed for a lifetime, today's society demands continuous adaptation and growth. Lifelong learning equips individuals with the skills to navigate these changes, fostering resilience and relevance in an increasingly competitive world. The modern workplace is a prime example of this necessity. Automation, artificial intelligence, and digital transformation are redefining job roles and creating new ones at an unprecedented pace. Lifelong learning enables individuals to upskill, reskill, and remain agile in their careers, ensuring they are not left behind. Beyond technical knowledge, it also cultivates critical thinking, creativity, and emotional intelligence.

Moreover, lifelong learning extends beyond professional realms. It enriches personal lives by promoting intellectual curiosity, broadening perspectives, and enhancing adaptability. As societies grapple with climate change, social inequality, and public health crises, informed and engaged citizens are crucial. Lifelong learning empowers individuals to contribute meaningfully to these collective efforts. In a world where the only constant is change, the ability to learn, unlearn, and relearn is a vital skill. Lifelong learning is not just a personal pursuit but a societal imperative. By embracing it, individuals can thrive in uncertainty, and societies can cultivate innovation, progress, and shared prosperity (Zrno et al., 2021).

In general, education, whether aimed at preschoolers, pupils, students, adults or even seniors, is a very complex process that can affect a person's development at all stages of their life. However, education also has its pitfalls. With the development of society, people's interest in education is gradually decreasing because the labour market is saturated with people with complete university education who have difficulty finding a job. This is the main demotivating factor that affects education. However, it is necessary to realize that education does not only concern higher education, but the importance of lifelong learning is increasingly coming to the fore, which, especially in the form of professional and retraining courses, can contribute to better application in the labour market and better preparation for many literacies (Cannistra et al., 2022). This fact is little known in society. Since education has always gone hand in hand with enlightenment, enlightenment in this area is essential. However, it is challenging to communicate information about education because traditional marketing communication tools may not be as successful

as in the case of communication about products. Therefore, it is necessary to find appropriate marketing communication tools to contribute to adult education awareness.

The concept of education has gradually become established in modern pedagogical theory, and it is a broader concept compared to the traditional idea of education. In addition to education, education also includes upbringing (Kobylarek et al., 2021). No other equivalent could express the connection between education and upbringing in the Slovak language. The connection between these two concepts is often used, e.g., in the form of educational-educational, which can seem artificial and impractical.

Today's job market is more competitive than ever, with rapid technological advancements and globalization intensifying the saturation. Employers are inundated with highly qualified candidates, making it increasingly difficult for professionals to stand out. Degrees and certifications that once guaranteed employment are now seen as entry-level requirements. This reality underscores the critical need for continuous professional development (Shahzad et al., 2023).

As industries evolve, so do the skills required to thrive in them. Technologies like artificial intelligence, automation, and big data are transforming roles, rendering some obsolete while creating demand for new expertise. Continuous professional development enables individuals to stay ahead of these shifts, ensuring they remain valuable assets to their organizations. Beyond technical skills, ongoing learning fosters adaptability, innovation, and problem-solving. In a saturated job market, the commitment to lifelong growth can be the distinguishing factor that propels individuals toward sustained career success (Konvit et al., 2023).

Motivations for lifelong learning include career advancement, personal development, and skill acquisition. Many learners view it as a way to stay competitive in the job market or pursue interests outside their professional domain. The flexibility of online courses and the accessibility of digital platforms also appeal to busy individuals. Barriers to participation include financial constraints, lack of time, and limited awareness of available opportunities. For older learners, digital literacy can be a significant obstacle. Institutions must address these barriers by offering affordable, flexible, and user-friendly learning options while investing in outreach to underserved populations (García-Toledano et al., 2023).

Education is, therefore, a more appropriate term than the combination mentioned above of education and training because it includes all existing formal and informal education and upbringing, from the preschool educational process to lifelong learning or third-age education (Spantekova & Smekalova, 2015).

Prucha (2009) points out that education can be considered a new term. On the other hand, classical terms include upbringing and education. However, according to him, all these terms form subsets of pedagogy as such. For illustration, he defined these terms as follows:

- Education is an activity that, in an educated society, ensures the transmission of socially accepted spiritual ideas from generation to generation, which includes both the mediation of behavioural norms, communication rituals, hygiene habits and socialization, which is aimed at the integration of the individual into society. Pedagogy understands education as a deliberate action on an individual's personality to achieve changes in various components of the personality.
- Education is a specific concept that does not overlap with the idea of upbringing because pedagogy understands it as a deliberate and coordinated acquisition of knowledge, skills and attitudes that an individual acquires through teaching at school.
- Education is an activity in which one individual tries to convey learning to another, i.e., both individuals meet in an educational reality in which educational processes occur. Education can also take place in ordinary life situations, but it is most often encountered in school, where the so-called school education takes place. In this case, the pedagogy theory also understands education as a process in which upbringing and education are combined. Compared to education, education itself has a longer-term course, is carried out by professional educators (e.g. teachers), and is based on a specific legislative definition.

For the correct and effective educational system to function, it is necessary not only to interrelate individual elements but also to respect and adhere to fundamental principles. First of all, it is required to comply with the principles of the system as such, which include integrity and organization, orientation on essential system elements, orientation on system relationships (external and internal) and orientation on basic

developmental laws of a set of elements. Subsequently, these general system principles must be expanded to include communication principles.

With overwhelming content competing for attention, many businesses and organizations struggle to connect with their target audiences. This disconnect often stems from insufficient or poorly executed online marketing strategies.

Effective online marketing is crucial to bridging this gap. It combines tools such as social media, search engine optimization, content marketing, and targeted advertisements to reach and engage audiences. A well-crafted strategy ensures that the right message reaches the right people at the right time, enhancing visibility and fostering trust (Shuppe et al., 2024).

Moreover, online marketing is cost-effective and measurable, allowing businesses to adapt quickly and refine campaigns based on performance metrics. In an era where visibility equals viability, prioritizing strategic online marketing is essential to combating the challenge of public unawareness and achieving sustained impact (Beno, Kriz & Caganova, 2023).

Communication, as such, is a standard part of life. On the other hand, it is included in the essential marketing mix, the elements of which are, in addition to, product, price, and place (distribution). Therefore, the historical development of marketing communication can be summarised as follows: advertising was the first form of marketing communication (Ishchenko et al., 2023). Promotion and advertising are terms that are often confused in the literature, but terminological inconsistency has caused these terms to be confused with the term marketing communication.

Theoretical Framework

Digital marketing has become a cornerstone for educational institutions aiming to attract, engage, and retain learners. Effective strategies include leveraging social media, optimizing websites for user experience, and utilizing search engine marketing and email campaigns. Institutions can create engaging content such as blogs, webinars, and video tutorials to demonstrate their expertise and build trust. Targeted advertisements on platforms like Google and Facebook allow institutions to reach specific demographics, such as younger adults or professionals seeking career advancement (OECD, 1999).

Social media platforms are particularly effective for real-time engagement. Institutions can foster community by creating interactive posts, polls, and live Q&A sessions while addressing prospective learners' questions and concerns. Collaborations with influencers in education or alumni testimonials can further enhance credibility. Moreover, analytics tools provide valuable insights into audience behavior, enabling institutions to tailor their strategies and measure success (UNESCO, 2023).

Therefore, Marketing communication is the equivalent of the fourth component of the marketing mix, promotion. This results from many years of practice and its integration into marketing theory, especially in the USA and Western Europe. Equating marketing communication to the term promotion would be outdated because promotion today only represents advertising, which is also extended to non-economic areas because promotion seeks to disseminate commercially beneficial information and ideas in general. Thus, not all regions have replaced the term promotion with promotion or marketing communication (Hornak, 2018).

Marketing communication evolved from the integral term marketing, with market meaning market and the ending expressing a particular activity. Marketing gained importance over time, especially in the 1990s, when it began to be taught at American universities in 1902. The first marketing book, *Marketing*, was published in the USA as early as 1905. Around 1920, marketing theory began to merge with practice, supporting new marketing works' emergence. 1932 was a turning point for marketing because the American Marketing Association (AMA) was founded in the USA. In Europe, marketing began to develop only after World War II. Because the term marketing was gradually adopted from English into other languages such as German, French, Russian, Hungarian and Polish, it gradually became established in Slovak as well, as an expression of an unavoidable reality, the main attribute of which is a market-oriented economy (Prachar, 1991).

In Slovakia, marketing communication began to develop more significantly after 1990, when Slovakia was part of Czechoslovakia and at that time the first independent university study of advertising in Czechoslovakia was established. Our economy changed from centrally planned to market, resulting in marketing communication becoming necessary. With the opening of the market, the importance of monopoly advertising and promotional agencies was lost, and space was created to emerge new ones, with their number climbing to several thousand. In addition to domestic advertising agencies, renowned advertising agencies from abroad also began to come to our territory, which were initially based in Prague but gradually moved to other cities in Czechoslovakia. Gradually, associations and associations that covered them were established with advertising agencies, first at the federative level, later divided into Czech and Slovak. After the division of Czechoslovakia, a turning point in the field of marketing communication education occurred in 1995, when the SOSPPRA organization was established, associating marketing communication workers in Slovakia - SOSPPRA closely cooperated with the then Department of Promotion of Comenius University in Bratislava (currently the Department of Marketing Communication), which was also established in 1995. In the Czech Republic, a turning point in the field of marketing communication education occurred in 1997, when an Institute was established at the Faculty of Technology of Tomas Bata University in Zlin, where two departments were created - the Department of Advertising Creation and the Department of Advertising Communication (Hornak, 2010). It follows from the above that adult education and marketing communication have standard features, of which the implementation of an informative function, including an educational and training function, can be highlighted. Upbringing and training are the main attributes of education. As part of the informative function, which is the main attribute of marketing communication, they act as areas in which education and marketing communication intersect.

The social aspects of marketing communication are related to its connection with sociology. As mentioned, marketing communication is a relatively young scientific discipline inspired and influenced by several established scientific disciplines during its development. Theoretical reflection has not been able to keep up with the dynamic development of marketing communication, which is mainly based on practice. Marketing communication, which is rich in theoretical concepts and practical opinions and approaches, has gradually established itself in the system of social sciences mainly due to its proximity to sociology and the fact that sociology is also concerned with collecting information from surveys and research. Such information also serves marketing communication experts, advertisers, and consumers. Marketing communication, like sociology, collects information about "the structure of the population, their needs, attitudes, purchasing habits, products that are the subject of sale, etc." (Hornak, 2010, p. 325).

Another social attribute of marketing communication is its significant theoretical basis connected with empiricism, which is based on reality, i.e., people's or projects' everyday lives (Vartiak, 2015). The social aspect of marketing communication, which it has in common with sociology, is empirical research based on everyday interpersonal communication, sociological research, psychological research, marketing research and media research. The theoretical foundations of marketing communication are thus regularly verified in social reality while also being guided by the standard expected behaviour of the recipient of the marketing communication message with regard to his social position.

As has also been mentioned, marketing communication is based on interaction, and it is interaction, or social interaction, which is another of its social attributes. Social interaction includes verbal and non-verbal communication, which form the basis of marketing communication and sociology. Symbols and symbolism represent another of the social attributes of marketing communication because colours, objects, numbers, figures, and nature can also be considered symbols, and the meaning of symbolism can be clearly seen in them. In marketing communication, it is essential to use and point out appropriate symbols, thanks to which the recipient knows that such communication is intended for him. Symbols mediate and interpret the desired communication of a fact to which people attribute a specific meaning (Nadanyiova et al., 2021). Symbolism can then increase the effectiveness of the perception of social reality, which implies that the individual social attributes of marketing communication are interconnected. The last significant social attribute of marketing communication is the ability to communicate with the market, which is essentially made up of people, and people also make up society.

Marketing communication includes communication with the entire market (group communication) or communication with a specific market entity (interpersonal communication), aiming first to satisfy an individual need and only then the needs of society. However, from the marketing communication perspective, satisfying needs is understood from the standpoint of quality and economy. Communication with the market can also take place in issues of societal importance, such as so-called social campaigns,

such as a campaign to limit smoking, a campaign to fight drugs, or a campaign for health care (Hornak, 2010). However, it is also vital for individual business entities that are trying to excel their position in the market (Jankalova & Vartiak, 2017). However, ethics and a social approach are significant elements also applied in education. Therefore, it can be said that these are other intersecting areas of education and marketing communication.

The content of marketing communication should consist of solid arguments because weak ones will be insufficient for the target group. However, the content side goes hand in hand with the formal side because it is the latter that can best influence the rationality and emotionality of the target group. The rational side of marketing communication is built on the facts that the communication contains. The facts are direct and effective, especially for a target group considering a purchase and most of all in the case of purchasing a long-term product (Garbarova, Bachanova & Vartiak, 2017). On the contrary, the emotional side is crucial if it is not about buying products but, for example, about contributing to non-profit and charitable purposes or if the goal is to influence the social side of a person. However, suppose the effectiveness of marketing communication is not sufficient. In that case, one option is to involve an expert whom people will trust (for example, involving a famous chef in a marketing campaign for selling food). In addition to experts, people also trust celebrities (so-called celebrity endorsements), whether they are actors, singers, TV presenters, or editors. Thanks to these marketing moves, the brand will strengthen its credibility and quality (Karlicek et al., 2016).

The mass communication model uses all available information about the target group thanks to the media used, and communication can occur in such a way that information is directed from one sender to several recipients or from several senders to several recipients. The marketing message is then spread through the media, and the main reason for using this model is the effort to reach the broadest possible target group or as many target groups as possible. In this case, it is challenging to obtain immediate feedback because it is more or less one-sided communication. Such marketing communication can take place at the regional or national level. The mass communication model differs from the virtual communication model, especially in the possibility of obtaining feedback, because virtual communication takes place mainly via the Internet, where various tools for collecting and analyzing feedback data can be implemented (Wiktor, 2013).

The main venue for virtual communication is the World Wide Web system, which we know for short as www. Virtual communication is the most widely used marketing communication model when several marketers are interested in reaching several recipients simultaneously. All this is possible, especially with the development of the Internet into its current form, Web 2.0, which allows for the erasing of boundaries even faster than the original www protocol. The specific feature of marketing communication in virtual communication is the broadcasting of a multimedia message, which has a dynamic audio-visual form and is often interactive. This form of marketing communication can reach mainly the so-called classic target group (mainstream), which is most susceptible to receiving multimedia content (Wiktor, 2013). Interpersonal, mass, and virtual communication also have their place in education and can take place in all these ways. Therefore, in addition to the informational, ethical, and social areas, education and marketing communication also meet and support each other in communication and the choice of communication models (Jaseckova, Konvit & Vartiak, 2023). Just as marketing communication is moving entirely into the virtual realm (online space), education is increasingly taking place online due to the development of information and communication technologies (e.g. e-learning).

Social media has revolutionized how educational institutions communicate with learners. Platforms like Facebook, Instagram, LinkedIn, and TikTok allow institutions to reach diverse audiences through engaging content. Social media can be a platform for sharing updates, promoting courses, and providing accessible learning resources. In education, social media facilitates collaboration and discussion through groups and forums. It enables peer-to-peer learning and fosters interaction between students and educators. Institutions can also create dedicated profiles to share lifelong learning opportunities, making it easier for users to access information in one place. Social media can make learning more interactive and enjoyable by integrating gamification elements, such as quizzes or challenges (Tkacová et al., 2022).

Methodology

The paper's main objective is to analyze the attitudes of participants and prospective lifelong learning participants towards online marketing communication of educational institutions.

The paper's main objective was determined based on the results of a pre-test conducted on a sample of 128 respondents aged 18 to 62, where they were asked about their potential interest in completing lifelong learning and the appropriate form of marketing communication from an institution providing lifelong learning. Of the respondents interviewed, only 16.41% stated that they had already completed a course or training within lifelong learning in the past. When asked whether they planned to complete a course or training within lifelong learning in the future, as many as 55.47% of respondents responded positively. Of the institutions providing lifelong learning, respondents are mainly familiar with universities (87.50%), further education institutions (32.81%), secondary schools (23.44%) and finally language schools (17.19%). The respondents did not use the option of adding another institution providing lifelong learning. Most respondents learned about institutions providing lifelong learning on the Internet (58.59%), on the radio (14.06%), at the Labour Office (13.28%) and in the press (4.69%).

In contrast, none of the respondents marked the option "television". Seventy-five respondents who marked the option "internet" in this question had the opportunity to continue with an additional question, the aim of which was to find out what the most suitable source of information about lifelong learning on the Internet is for them. As many as 81.33% of respondents stated that the most suitable source of information about lifelong learning on the Internet for them is the profiles of educational institutions on social networks, and 16% of respondents opted for the websites of academic institutions. Only 2.67% of respondents marked the Ministry of Education, Science, Research and Sport website of the Slovak Republic. Based on the pre-test results, we concluded that the most suitable form of marketing communication on the Internet in lifelong learning is social networks, or rather, profiles of educational institutions on social networks.

The paper employed a mixed-method approach, integrating data collection from educational institutions in Slovakia and a comprehensive survey among prospective lifelong learners. The objective was to analyze the attitudes toward online marketing communication by educational institutions, focusing on lifelong learning opportunities:

- Data collection from educational institutions: An exhaustive analysis of Slovak colleges and universities was conducted. Information was gathered on 35 institutions comprising 20 public universities, three state universities, and 12 private universities, representing 115 faculties. The study identified the lifelong learning programs offered by these institutions, such as vocational courses, University of the Third Age programs, language courses, professional education (e.g., MBA, MSc, LL.M, DBA), and teacher education. Additionally, the presence of these institutions on social media platforms was evaluated. Of the 26 institutions actively providing lifelong learning, 23 maintained social media profiles, primarily on Facebook, while others extended their presence to platforms like YouTube, Instagram, Twitter, LinkedIn, and Vimeo.
- Survey design and implementation: A quantitative survey was conducted to explore the perceptions and attitudes of individuals regarding lifelong learning and online marketing communication by educational institutions. The survey was distributed via Facebook, targeting users who interacted with the social media profiles of educational institutions. Anonymity was ensured, and 633 valid responses were collected from the original sample of 826 people contacted. The demographic composition of the respondents included 48.34% men and 51.66% women. Age groups ranged from 18–62 years, with the highest representation (49.29%) in the 18–30 age category and no respondents over 62 years. The survey consisted of eight questions designed to capture respondents' prior participation in lifelong learning, future interests, preferred institutions, sources of information, and attitudes toward social media's role in lifelong learning marketing.
- The choice of Facebook as several factors drove the primary survey distribution platform. Firstly, Facebook is widely used in Slovakia, making it an accessible medium to reach a diverse audience. Among Slovakia's institutions providing lifelong learning, 23 of 26 actively maintain profiles on Facebook, indicating its dominance as a marketing and communication tool. This aligns with pre-test findings, where 81.33% of respondents identified educational institutions' social media profiles as their preferred source of information. Facebook's robust targeting tools and engagement features allowed researchers to reach users interacting with institutional profiles, ensuring relevance to the study's objectives.
 - Facebook offers several advantages, including access to a broad demographic that encompasses key age groups targeted in this study, the ability to target users based on their likes, comments, and interactions to ensure a relevant and engaged sample for educational content, and cost-

effectiveness, as it provides a more economical solution for large-scale data collection compared to traditional survey distribution methods.

- The study faced several disadvantages, including the exclusion of individuals not active on Facebook, which introduced selection bias, and the potential limitation of findings due to platform-specific behavior, as respondents' preferences and actions might primarily reflect Facebook usage patterns rather than broader trends. Additionally, reliance on user interaction metrics confined the study to active participants engaging with educational profiles, potentially overlooking the insights of passive observers.
- **Data analysis:** The survey responses were analyzed quantitatively to identify trends and preferences. Respondents were divided into groups based on their experience with lifelong learning: 36.49% had previously participated, while 63.51% had not. For those interested in future participation, universities were the preferred institutions (69.06%), followed by further education institutions, secondary schools, and language schools. The survey also assessed the effectiveness of various information sources, revealing that 81.67% of respondents relied on the Internet, while traditional media like radio and television played a negligible role. Further analysis focused on the role of social media profiles as sources of information. A majority (67.46%) found institutional profiles clear and valuable. Additionally, a significant number of respondents (74.41%) supported the idea of a centralized social media profile summarising lifelong learning opportunities in Slovakia, and 65.40% expressed interest in following such a profile.
- **Limitations:** The reliance on Facebook excludes individuals who do not use the platform, particularly older adults, as no respondents over 62 participated, potentially skewing findings toward younger, digitally active demographics. The insights heavily depend on Facebook-specific dynamics, limiting their applicability to broader social media or offline preferences. The results also reflect attitudes specific to Slovakia, making them less generalizable to other geographical or cultural contexts. Furthermore, as with all surveys, self-reported data introduces the risk of response bias, where participants may provide socially desirable answers.

Results and Discussion

Currently, 35 colleges and universities in Slovakia provide education to 115 faculties. There are twenty public colleges and universities, including the Academy of Arts in Banská Bystrica, the University of Economics in Bratislava, the Catholic University in Ružomberok, the University of Prešov in Prešov, the Slovak University of Agriculture in Nitra, the Slovak University of Technology in Bratislava, the Technical University in Košice, the Technical University in Zvolen, the Alexander Dubček University of Trenčín in Trenčín, the University of Trnava in Trnava, J. Selye University, Comenius University in Bratislava, Constantine the Philosopher University in Nitra, Matej Bel University in Banská Bystrica, Pavol Jozef Šafárik University in Košice, the University of St. Cyril and Methodius University in Trnava, University of Veterinary Medicine and Pharmacy in Košice, University of Performing Arts in Bratislava, University of Fine Arts in Bratislava, University of Žilina in Žilina. There are three state universities, namely the Academy of the Armed Forces of General Milan Rastislav Štefánik in Liptovský Mikuláš, the Academy of the Police Force in Bratislava, and the Slovak University of Health Sciences in Bratislava. Public and state universities are complemented by private universities, such as the Media Academy - a professional university of media and marketing communication in Bratislava, the Bratislava International School of Liberal Studies, the Ján Albrecht Academy of Music and Arts in Banská Štiavnica, the Pan-European University, the University of Security Management in Košice, the Danubius University, the DTI University, the University of Economics and Public Administration Management in Bratislava, the University of Management in Trenčín, the University of International Business ISM Slovakia in Prešov, the University of Health and Social Work of St. Elizabeth in Bratislava. These universities can be classified as institutions providing education for adults because university students, whether full-time or part-time, have reached the age of 18 and are thus preparing for work or studying alongside their employment.

Most colleges and universities provide lifelong learning through professional courses, with as many as 17 colleges and universities. Sixteen also provide lifelong learning through the University of the Third Age. 12 colleges and universities provide language courses, and 12 also provide Supplementary Pedagogical Studies. Professional education (e.g., MBA, MSc, LL.M, DBA) is provided by nine colleges and universities, and six offer courses aimed at teacher education.

Therefore, vocational courses are the most frequently provided lifelong learning at Slovak universities and colleges. Vocational courses are attended mainly by employed people interested in improving their qualifications. Still, they can also be attended by unemployed people interested in finding a job thanks to their new qualifications.

The University of the Third Age is the second most frequently provided lifelong learning by Slovak universities and colleges, and this education is primarily provided to people of retirement age.

Supplementary pedagogical studies and language courses are specific lifelong learning because only certain groups of people are interested in them. Supplementary pedagogical studies primarily interest people who plan to teach in primary, secondary, kindergartens or clubs providing extracurricular activities. On the other hand, language courses are attended mainly by employed adults who need to improve their language level for work purposes or people who want to learn a language in their free time.

An important place in lifelong learning is also occupied by vocational education, the result of which is the award of a professional (non-academic) degree. The most common are the MBA (Master of Business Administration), MSc (Master of Science), LL.M (Master of Laws, or Legum Magister) and DBA (Doctor of Business Administration). Such vocational education represents added value, especially for employed people interested in obtaining new information in their field of activity, which is presented to them by university teachers and recognized experts from practice. This type of education is becoming increasingly popular in Slovakia because university studies are often considered only on a theoretical basis. Still, vocational education provides mainly a practical perspective on the issue.

Teacher education, divided into updating, innovation and qualification, represents an essential source of information for teachers. Its popularity among teachers is high, mainly because, thanks to completing such education, teachers can increase their income through additional payments. It is, therefore, the most specific form of lifelong learning because such education must be accredited by the Ministry of Education, Science, Research and Sports of the Slovak Republic, but only teachers can participate in it.

Regarding the presence of universities and universities on social networks, we found that out of 26 universities and universities providing lifelong learning in Slovakia, 23 of them have a profile on social networks. At the same time, only three of them have created an individual profile for the centre or department providing lifelong learning (Institute of Lifelong Learning of the Slovak University of Technology in Bratislava, Center for Further Education of Comenius University in Bratislava and Institute of Lifelong Learning of the University of Žilina in Žilina) and one of them has created a profile for the faculty covering lifelong learning (Faculty of Education of the Catholic University in Ružomberok). Two universities do not even have a profile on any social network (Slovak University of Health Sciences in Bratislava, University of Economics and Management in Bratislava).

All 23 universities that have a profile on social networks have a profile on Facebook. In addition, 10 of them also have a profile on YouTube, 7 on Instagram, 3 on Twitter, 1 on LinkedIn and 1 on Vimeo.

Of the 826 people originally addressed, 633 respondents from all over Slovakia participated in the survey, while the questionnaire was anonymous and was distributed via the social network Facebook. Fans of individual profiles of colleges and universities included in the methodology were addressed. Since the list of fans is not publicly available, only those fans who liked or commented on posts published on individual profiles were addressed. Of the total 633 respondents, 306 were men, representing 48.34%, and 327 were women, representing 51.66%. The age categories of respondents were as follows:

- 18-30 years: 312 respondents (49.29%),
- 31-40 years: 118 respondents (18.64%),
- 41-50 years: 112 respondents (17.69%),
- 51-62 years: 91 respondents (14.38%),
- over 62 years: 0 respondents (0.00%).

The identification part was followed by a survey that focused on marketing communication in adult education, emphasizing lifelong learning and the Internet environment. The survey consisted of eight questions.

The first question, worded "Have you already completed a course or training within lifelong learning?" divided the respondents into two groups according to their answers, with the first group of 231 respondents (36.49%) having already completed a course or training within lifelong learning in the past. The second group of 402 respondents (63.51%) had not completed such a course or training yet. The second group (402 respondents) was moved to question number three.

The first group (231 respondents), therefore, continued with question number two, which read, "Which institution providing lifelong learning did you use?" the answers were as follows:

- University: 169 respondents (73.16%),
- High school: 22 respondents (9.52%),
- Language school: 9 respondents (3.89%),
- Further education institution: 29 respondents (12.55%),
- Other: 2 respondents (0.87%).

It follows from the above that a minor part of the respondents had already completed a course or training within lifelong learning, with most of them having completed such education at a university and the least at a language school. Two respondents marked the option "other".

Question number three, which was "Are you interested in completing a course or training within lifelong learning in the future?" was therefore continued by all respondents because we assume that both those who have already completed a course or training within lifelong learning and those who have not yet completed such education may be interested in completing it or further such education in the future. However, this question again divided the respondents into two groups, the second of which consisted of 187 respondents (29.54%) who are not interested in completing a course or training within lifelong learning in the future, and these respondents continued with question number five.

The first group, with 446 respondents (70.46%), answered this question in the affirmative. It therefore continued with question number four with the wording "Which institution providing lifelong learning do you plan to use?" the results of which were as follows:

- University: 308 respondents (69.06%),
- Secondary school: 39 respondents (8.74%),
- Language school: 12 respondents (2.69%),
- Further education institution: 76 respondents (17.04%),
- Other: 11 respondents (2.47%).

Based on the above, it can be summarised that most respondents are interested in taking a course or training within lifelong learning in the future, mainly at a university and the least at a language school. Eleven respondents marked the option "other".

All respondents answered the fifth question, "Where did you learn about institutions providing lifelong learning?" because we assume that knowledge about lifelong learning is part of the general overview of every adult. Still, respondents could also indicate the option "I have not heard of lifelong learning yet" as one of the answers. Information about lifelong learning and the institutions that provide it can be obtained from various sources, and this was precisely the aim of this question. The respondents expressed themselves as follows:

- Labour Office: 72 respondents (11.37%),
- Periodical press: 38 respondents (6.00%),
- Radio: 6 respondents (0.95%),
- Television: 0 respondents (0.00%),
- Internet: 517 respondents (81.67%),
- I have not heard of lifelong learning: 0 respondents (0.00%).

The results showed that most respondents learned about lifelong learning institutions via the Internet. The least of them knew about lifelong learning institutions from the radio, and none marked the option "television". It is positive that our assumption that all respondents had, or have, information about lifelong

learning institutions was confirmed because none of them marked the option "I have not heard of lifelong learning yet".

The sixth question, "Is the profile of an educational institution on a social network a clear source of information about lifelong learning for you?" is one of the questions that focus on marketing communication via social networks by institutions providing lifelong learning, with the respondents answering this question as follows:

- Rather yes: 69 respondents (10.90%),
- Definitely yes: 427 respondents (67.46%),
- Rather no: 84 respondents (13.27%),
- Definitely no: 53 respondents (8.37%).

It follows from the above that the majority of respondents answered positively (496 respondents), and therefore, consider the profile of an educational institution on a social network to be a clear source of information about lifelong learning, with these respondents divided into a smaller group that marked the option "rather yes" and a dominant group that marked the option "definitely yes". On the contrary, only 137 respondents expressed their opinion negatively, with a smaller proportion of these respondents indicating the option "definitely not" and a slightly more significant proportion indicating the option "rather not". These results only confirmed our assumption that social networks are a good source of information about adult educational opportunities.

All respondents continued with the seventh question, which was "Would you like it if there was a social network profile that would summarise information about lifelong learning from all over Slovakia?" within which the following answers were recorded:

- Rather yes: 63 respondents (9.95%),
- Definitely yes: 471 respondents (74.41%),
- Rather no: 76 respondents (12.01%),
- No: 23 respondents (3.36%).

The results once again confirmed the importance of social networks in the field of marketing communication in adult education, as a significant majority of respondents (534 respondents) expressed their opinion positively, with a minor part of them indicating the option "rather yes" and a large majority indicating the option "definitely yes". On the other hand, only 99 respondents expressed a negative opinion on this question, with a minor part indicating the option "definitely not" and a more prominent part indicating the option "rather not". We evaluated these results very positively because the survey showed that a social network profile that would summarise information about lifelong learning from all over Slovakia is a solution that could make such education more attractive within Slovakia, especially for people using social networks.

The eighth question, "Would you become a fan of such a profile on a social network that would summarise information on lifelong learning from all over Slovakia?" served to determine whether the respondents' interest in a profile on a social network that would summarise information on lifelong learning from all over Slovakia would be reflected in them becoming its fan, with the answers being as follows:

- Rather yes: 148 respondents (23.38%),
- Definitely yes: 414 respondents (65.40%),
- Rather no: 52 respondents (8.21%),
- Definitely no: 19 respondents (3.00%).

We again evaluate the results of the answers positively because an even more significant proportion than in the previous question expressed themselves positively, namely 562 respondents, of whom a smaller proportion marked the option "rather yes" and a more significant proportion marked the option "definitely yes". Only 71 respondents expressed themselves negatively in this question, with fewer marking the option "definitely no" and more marking the option "rather no".

To discuss the results, the survey, conducted among 633 respondents from Slovakia via Facebook, reveals significant insights into attitudes toward lifelong learning and the role of social media. Of the participants, 48.34% were men, and 51.66% were women, with nearly half (49.29%) aged 18–30, indicating higher engagement among younger demographics. No respondents were over 62, highlighting a gap in outreach to older individuals. Only 36.49% had previously participated in lifelong learning, with universities being the dominant providers (73.16%), while language schools had the least representation (3.89%).

Future interest in lifelong learning was high, with 70.46% expressing a desire to enrol, primarily favouring universities (69.06%). Respondents overwhelmingly cited the Internet (81.67%) as their primary source of information about lifelong learning opportunities, with negligible reliance on traditional media such as radio (0.95%) and television (0.00%). This highlights the dominance of digital platforms in disseminating information.

The majority (67.46%) found social media profiles of educational institutions to be transparent sources of information, with 496 respondents responding positively to their usefulness. This demonstrates the importance of social networks in marketing educational opportunities. When asked about the potential for a centralized social media profile summarising lifelong learning opportunities in Slovakia, 74.41% responded positively, signalling the demand for such a solution.

The idea of becoming a fan of such a profile also resonated, with 65.40% of respondents expressing strong interest. These findings suggest that a centralized, accessible digital platform could significantly enhance engagement in lifelong learning. The survey reflects an untapped market, particularly among those who have not yet participated in lifelong learning (63.51%), and underscores the need for institutions to prioritize digital marketing strategies.

Universities are well-positioned to lead lifelong learning initiatives, given their popularity among respondents. However, there is potential for growth among secondary schools and further education institutions. The findings also underscore the critical role of social media, as most respondents actively engage with educational profiles and favour the creation of a centralized hub.

This survey provides actionable insights for improving the reach and attractiveness of lifelong learning. Institutions should enhance their social media presence, target younger audiences, and develop centralized resources. Additionally, efforts should be made to engage older adults, who are currently underrepresented. The results indicate that digital tools and platforms are crucial to fostering more significant participation in lifelong learning in Slovakia.

A notable strength of the survey is its balanced demographic representation across genders and the high participation of younger adults (18–30 years). However, the absence of respondents over 62 underscores a critical gap. Older adults represent an underserved demographic, and targeted outreach programs could address this disparity. Institutions might consider courses tailored to their needs, such as digital literacy or community-based learning programs.

The dominance of universities as the preferred providers (73.16% of past participants and 69.06% of future aspirants) highlights their pivotal role in lifelong learning. However, the low engagement with language and secondary schools suggests untapped potential. These institutions could benefit from offering niche programs or partnerships with other providers to diversify their appeal.

The reliance on the Internet (81.67%) and social media (67.46%) as primary information sources underscores the importance of digital marketing. The demand for a centralized social media profile (74.41% support) further emphasizes the need for accessible, cohesive information platforms. This allows institutions to collaborate and create a unified hub aggregating lifelong learning opportunities, enhancing user accessibility.

While the survey results are promising, they also indicate the need for outreach and program design innovation. Institutions should harness digital tools to engage broader demographics and explore new delivery methods to attract learners from all backgrounds. By addressing these challenges, Slovakia can cultivate a more inclusive and robust culture of lifelong learning.

Conclusions

The paper's main objective was to analyze the attitudes of participants and prospective lifelong learning participants towards online marketing communication of educational institutions.

The analysis of participants' and prospective lifelong learners' attitudes toward the online marketing communication of educational institutions in Slovakia reveals several critical insights aligned with the study's objective. Slovak universities and other educational institutions offering lifelong learning opportunities have a strong foundation but must address significant potential for enhancing their outreach and engagement strategies. The Internet and social media have emerged as the most influential channels for disseminating information about lifelong learning, with 81.67% of respondents citing the Internet as their primary source of information and 67.46% positively evaluating the social media profiles of educational institutions. This demonstrates that online marketing is crucial for effectively reaching and engaging adult learners.

The survey also highlights a strong preference for centralized information, with 74.41% of respondents expressing interest in a unified social media profile summarising lifelong learning opportunities. Such a platform would simplify exploring educational options and increase the visibility of institutions across Slovakia. Universities remain the dominant choice for lifelong learning among respondents, reflecting trust in their credibility. At the same time, secondary schools and further education institutions need to innovate and enhance their marketing efforts to attract more participants. Furthermore, younger adults, mainly those aged 18–30, show higher participation rates, whereas older adults are significantly underrepresented, indicating a gap in outreach and tailored programs for senior learners who could benefit from initiatives like the University of the Third Age.

The findings also underline the importance of tailoring marketing strategies to meet the needs of specific demographic groups. Lifelong learning offerings, such as vocational courses, language classes, and professional qualifications like MBA, MSc, LL.M, and DBA, cater to distinct audiences, allowing institutions to design targeted marketing efforts. The growing interest in professional and practical education among working adults highlights the importance of addressing this demand. Social media remains a strategic tool, with respondents showing strong interest in engaging with a centralized profile for lifelong learning opportunities, demonstrating its potential to enhance accessibility and awareness significantly.

The paper emphasizes the critical need for a centralized digital hub dedicated to lifelong learning, which would serve as a comprehensive resource for learners of all ages. Such a hub could provide a one-stop platform offering access to courses, certifications, career guidance, and community forums, making it easier for individuals to navigate and engage with educational opportunities. Additionally, robust and engaging social media content is pivotal in attracting and retaining learners. By utilizing creative storytelling, video tutorials, success stories, and interactive sessions, educational institutions can build stronger connections with their audiences, especially younger generations who rely heavily on digital platforms.

Furthermore, the paper highlights the importance of tailored campaigns targeting underrepresented demographics, particularly senior learners. Customized messaging and accessible content can help address their unique learning needs and inspire their participation in lifelong education. Similarly, institutions less represented in lifelong learning initiatives, such as secondary schools and language centers, have a vital role to play. By enhancing their outreach and creating specialized programs, these institutions can broaden their impact and ensure that diverse educational needs are met.

By leveraging these insights and focusing on digital platforms, Slovak educational institutions have a unique opportunity to expand their reach and foster greater participation. Such efforts will improve individual outcomes and contribute to a more inclusive and forward-thinking culture of lifelong learning in Slovakia. With intentional strategies and digital innovation, lifelong learning can become a cornerstone of societal progress, benefiting individuals and communities.

A potential future research direction to complement this paper is a qualitative study exploring participants' lived experiences with lifelong learning initiatives facilitated through digital platforms. This study would aim to understand how learners engage with a centralized digital hub and related resources, the challenges they encounter, and the impact of such platforms on their personal and professional growth. It would focus

on examining learners' perceptions and use of a digital hub, the role of social media and online forums in fostering engagement and community, and the experiences of underrepresented groups, such as senior learners and participants from institutions like language centers and secondary schools. Data would be collected through semi-structured interviews, focus groups, and participant diaries, with thematic analysis to identify key themes related to accessibility, engagement, and outcomes. Findings could offer valuable insights into the effectiveness of digital hubs, highlight gaps in current strategies, and provide actionable recommendations for improving inclusivity and user experience. By informing policymakers and educators, this research would help refine lifelong learning initiatives and contribute to a more inclusive and adaptive educational culture.

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Teachers' perceptions towards using artificial intelligence in mathematics education

تصورات المعلمين حول استخدام الذكاء الاصطناعي في تعليم الرياضيات

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Abstract

This study aimed to reveal teachers' perceptions about using artificial intelligence applications in mathematics education. A questionnaire consisting of (21) statements was designed and applied to (382) middle school mathematics teachers. The study used a mixed methodology of the sequential explanatory type. Based on the results, most of the mathematics teachers do not use artificial intelligence applications in mathematics teaching practices. By conducting interviews with a sample of them, the reasons for this were revealed, which is that some applications do not accurately support the Arabic language. This result is also due to teachers' weak conceptual background in using artificial intelligence. The results also revealed that there is a high degree of agreement among mathematics teachers about the importance of artificial intelligence for the mathematics teacher, students, and classroom interaction. The results indicated that there were no statistically significant differences between male and female and the experience of teachers in using artificial intelligence in mathematics education. Accordingly, implications and suggestions for researchers and math teachers are presented to maximize the benefit of AI applications in mathematics education.

Keywords: Artificial intelligence, mathematics education, mathematics teacher' Perceptions.

المخلص:

هدفت الدراسة الحالية إلى الكشف عن تصورات المعلمين حول استخدام تطبيقات الذكاء الاصطناعي في تعليم الرياضيات، وتم تصميم استبانة مكونة من (21) عبارة، تم تطبيقها على (382) معلماً ومعلمة رياضيات في المرحلة المتوسطة بمنطقة الرياض التعليمية، واستخدمت الدراسة المنهجية المختلطة من النوع التفسيري التتابعي لدمج البيانات الكمية والنوعية. وبناءً على النتائج فإن أغلب معلمي الرياضيات المشاركين في الدراسة لا يستخدمون تطبيقات الذكاء الاصطناعي في ممارسات تدريس الرياضيات، ومن خلال إجراء المقابلات مع عينة منهم تم الكشف عن أسباب ذلك، ومنها أن بعض التطبيقات لا تدعم اللغة العربية بشكل دقيق، كما كشفت النتائج عن وجود درجة عالية من الاتفاق بين معلمي الرياضيات حول أهمية الذكاء الاصطناعي بالنسبة لمعلم الرياضيات والطلاب والتفاعل الصفّي، كما أشارت نتائج الدراسة إلى عدم وجود فروق ذات دلالة إحصائية بين متوسط تصورات المعلمين حول استخدام الذكاء الاصطناعي في تدريس الرياضيات وفقاً لمتغيري الجنس والخبرة، وعليه تم تقديم المضامين والمقترحات للباحثين ومعلمي الرياضيات لتعزيز الاستفادة من تطبيقات الذكاء الاصطناعي في تعليم الرياضيات.

الكلمات المفتاحية: الذكاء الاصطناعي، تعليم الرياضيات، معلمو الرياضيات، تصورات المعلمين

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Introduction

Billionaire Ray Dalio famously said, “We are heading toward a new world in which you either be able to write algorithms...or you will be replaced by algorithms” (Holmes et al., 2019). As an expression of the necessity of keeping pace with the requirements of the Fourth Industrial Revolution, and contributing to its development and benefiting from it, rather than confronting it and not dealing with it.

In 1955, McCarthy et al., (2006) refer to that first used the term AI in a research workshop and defined the AI problem as “making a machine behave in ways that would be called intelligent if a human were so behaving” (p. 12). AI has a noticeable impact on various aspects of life, including education. This branch of science, which studies the development of machines that can simulate the thinking process of humans, has changed the interaction between the elements of the education system: the learner, the teacher, and the institution. Introducing AI into existing systems can simply enhance human actions in terms of time savings, ease of access, and other positive effects (Zafari et al., 2022). However, the teaching methods followed in education systems are usually traditional and theory based. This often causes learners who are accustomed to experience-based learning to fail. AI is revolutionizing various fields, and its application in education, particularly in mathematics, has gained considerable attention. This theoretical framework aims to explore the potential impact of AI on mathematics education, drawing on key concepts from educational technology, cognitive psychology, and AI research.

The educational process has witnessed many developments in recent years due to the development of technology. Searching on the Internet has become an essential part of the various stages of education, and tablets have now replaced books, or some of them, in our schools (Vaerenbergh & Pérez-Suay, 2021). But all these developments that surprised us yesterday may lose their luster. Considering the expected increase in the adoption of AI in education at a tremendous rate. AI is critical to UNESCO’s efforts to achieve Sustainable Development Goal 4 by 2030 – “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.” In doing so, the United Nations aims to fulfill the promise of “AI for All” in the hope that the technology will help provide equal educational opportunities (Sajid, 2023). Many achievements based on AI technologies have exceeded human capabilities: a chess machine defeated the world champion in 1997, and in 2016 other machines beat one of the world’s best players in the game “Go” and excellent players in poker. Computers prove - or help prove - mathematical theorems. Knowledge is built automatically from huge data measured in terabytes or even petabytes, using machine learning techniques (Shakarian et al., 2023).

Applications of AI affect almost all sectors, especially in the field of education, as it has become possible to transform many of the current routine educational tasks into automated processes, and this would change the nature of many teacher roles. Features of AI in education include facial and speech recognition, facial analysis, natural language processing and other AI techniques to track each student's performance in the classroom in real time, analyze their emotions and engagements, monitor results in quantitative form, and advise accordingly (Knox, 2020). Applications of AI algorithms and systems in education have gained increasing interest year after year. It has been observed that the number of papers published in the topics “AI” and “Education” from Web of Science and Google Scholar has increased since 2010 (Wardat et al., 2023). Note that papers published in 2015-2019 constituted a large proportion, with approximately 70% of all papers indexed. As education develops, researchers are trying to apply advanced AI techniques, such as deep learning and data mining, to deal with complex issues and customize the teaching method for each student according to his or her preferred learning style (Chen et al., 2020).

The science of AI aims to develop systems that achieve a level of intelligence like human intelligence or better than it, and its applications are designed to imitate the actions of the human mind. The goal is to place human knowledge inside the computer within what is known as knowledge bases, and then the computer can, through software tools, search these rules and do by comparison and analysis, to extract and conclude the best answers and solutions to different problems. This is like what a person does when he tries to solve new problems that he encounters in his daily life, based on his previous experiences and experiences, through his expectations of possible outcomes, and through his skills in deduction and comparison between the best available solutions (Muhammad, 2021).

Based on the fourth goal of the Sustainable Development Goals (SDG), which refers to ensuring equitable and inclusive quality education and promoting lifelong learning opportunities for all. It emphasizes equal

learning opportunities for all throughout life. AI technologies are used to ensure equitable and comprehensive access to education for all groups and classes globally.

The use of AI in education requires the development of programs and infrastructure for individual learning, as well as financial and technical resources. In addition, there is a need to develop effective methods for evaluating the success and outcomes of such systems, and on the other hand, it requires teachers to be flexible and adaptable to these developments (Zavalevskyi et al., 2024, 203).

Incorporating technology into education requires more than just orienting math teachers on how to use it; it also requires them to understand how to integrate it into their curriculum effectively (Wardat et al., 2024). The current era is witnessing a scientific civilizational shift in various knowledge and information in general and in the field of education in particular. Examples of terms that have become famous in the field of scientific research include the following: educational technology, AI, ChatGPT, machine learning, deep learning (Schorcht et al., 2024), education for the twenty-first century, Twenty-first century competencies, teacher preparation for the twenty-first century, Saudi Vision 2030, Fourth Industrial Revolution, exponential technology, personal learning, competency-based learning, individual learning, adaptive learning. All these implications have resulted in strong trends towards the optimal use of AI applications in the field of education in general and in mathematics education in particular. Applications of AI in education have met some supporters and opponents. Several related studies have reported that learning outcomes are more effective when using AI to aid learning compared to traditional teacher-centered learning (Alzahrani, 2023; Hwang, 2021; Edwards et al., 2018; Ee & Huh, 2018; Cumming, 2008). While Reinhold et al. (2021)'s study emphasized the importance of emotional support in using AI in mathematics education.

Several Arabic countries, including Saudi Arabia, UAE, Libya, Oman, Lebanon, Palestine, and Egypt, have started researching and utilizing AI within their systems and processes (Alzahrani, 2022, 296).

The current study is an extension of studies concerned with teachers' perceptions of contemporary educational issues related to teaching mathematics according to AI tools. The middle stage of general education was chosen because of its importance on the educational ladder, as it is the academic stage in which the student is allowed to use educational technologies in learning mathematics. Like a calculator. Therefore, the aim of the current study was to reveal the perceptions of middle school mathematics teachers about the use of AI applications in education in the Kingdom of Saudi Arabia. The problem of the study can be formulated in the following questions:

Questions

1. To what extent do teachers use AI applications in mathematics education?
2. What are teachers' perceptions about the use of AI in mathematics education?
3. To what extent do teachers' perceptions about AI differ according to the gender variable?
4. To what extent do teachers' perceptions about AI differ according to the variable of years of experience in teaching mathematics?

Literature review

The concept of AI

AI refers to the development of computer systems that can perform tasks that typically require human intelligence. These tasks include learning, reasoning, problem-solving, perception, language understanding, and decision-making. The goal of AI is to create machines or systems that can exhibit capabilities commonly associated with human intelligence, such as understanding natural language, recognizing patterns, adapting to new situations, and improving performance over time through learning (Molefi et al., 2024).

AI is the ability of computers to "perform cognitive tasks" that are commonly associated with human thinking, especially in problem solving and learning (Wang et al., 2021). The increasing use of AI in education is due to advances in technology, which means that technology can be used to enhance learning and research. One of the most common and important applications of AI is by teachers in a formal classroom environment, where they use information and communication technology (ICT) to deliver materials to their

students. They can also be used to tailor learning materials to meet the needs of individuals, reducing heavy workloads in environments where workload is a burden on teachers (Alzahrani, 2023). AI is the science that makes machines capable of making decisions and acting intelligently by imitating humans and their way of thinking. We humans obtain information from the outside world, process it in our minds, and make judgments and conclusions based on it and based on our previous experiences.

Relation between AI and educational technology

Alzahrani (2022) refers to the fact that integrated education must adapt to the profound changes imposed by the Fourth Industrial Revolution, which is one of the most important global challenges facing education and learning today (p. 295). Polían et al. (2024) aimed to improve the use of AI in education by analyzing international experience. The main methods used in the study were general scientific methods, documentary analysis, econometric statistics, and factor analysis. The results showed a rapid growth in the demand for AI in virtual learning systems in all countries under study. The results revealed a trend towards increasing demand for these applications. The study confirmed that AI plays an important role in the educational process and that future research should focus on evaluating its effectiveness in training teachers and specialists.

Many authors emphasize that one of the most important components of the development of modern information technology is the use of AI applications, especially in the field of education (Ryzheva et al., 2024, 286). Figure 1. shows the chronological development and relationship between AI, machine learning, and deep learning from 1950 to 2010 onwards. AI, as a broad and advanced term for computer intelligence, began between the 1950s and 1980s, followed by the introduction of machine learning technology between the 1980s and 1980s. In 2010, learning through algorithms was put on the agenda, and finally, after 2010, deep learning emerged as an advanced technology for implementing machine learning via neural networks to complete very complex thinking tasks. In this context, the following sections examine the two vital techniques of machine learning and deep learning to better understand and explore the world of AI. In addition, Natural Language Processing (NLP) and one of its best examples, intelligent personal assistants, are discussed in detail (Goksel & Bozkurt, 2019).

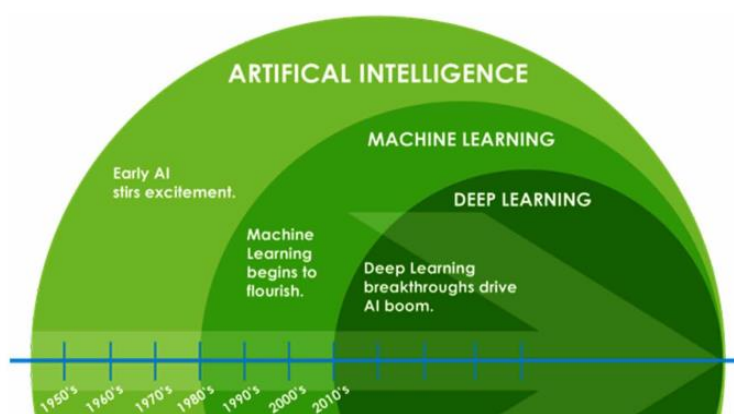


Figure 1. The relationship between AI, machine learning, and deep learning

The field of AI in education (AIED) has witnessed significant developments over the past 25 years. When we reflect on our past and shape our future (Roll & Wylie, 2016). A robot can be designed to help the teacher complete teaching tasks in the classroom (Timms, 2016).

Benefits of AI applications in Math education

AI now plays a major role in creating individual learning paths for each student in math education. It can analyze and process large amounts of data, considering individual needs and abilities. AI can recommend personalized learning materials and tasks that meet specific needs. With the help of specialized AI systems, teachers are provided with tools to create unique curricula that help develop individual skills and learning achievements for each student, considering students' strengths, weaknesses, goals, and interests. AI can also provide continuous monitoring of learning progress and adapt programs in real time (Zavalevskiy et al., 2024, 204).

Experts (Blanchard et al., 2009; Chen et al., 2020; Goksel & Bozkurt, 2019; Roll & Wylie, 2016; Shakarian et al., 2023; Alzahrani, 2023) agree on the importance of AI in education in the twenty-first century because of its many advantages, including the ability to learn (Machine Learning), the ability to organize and understand science (Knowledge Representation), the ability to analyze language (NLP), and the ability to understand sound (Speech Recognition), understanding and analyzing images and video, Computer Vision, problem solving, creativity, emotional and social coping, moving robots and general intelligence (AGI), which includes doing all of the above, explaining academic subjects, providing immediate feedback on the answers, providing academic advice and guidance to students about the best A department that can be enrolled in college or to study subjects that suit their mental abilities. Reaching many students helps make classes accessible to everyone, especially if they speak different languages or suffer from hearing disabilities. Sawalma & Al-Saeed (2023) showed the effectiveness of an application based on AI in developing logical thinking skills and motivation towards learning computer course.

Therefore, integrating technology and traditional teaching methods has many benefits. They range from intelligent teaching systems and smart content creation for students to automating administrative tasks. Sajid (2023) states that there are many benefits of AI in the field of education, including:

- Enhance student engagement: AI applications contribute to making the learning experience more interactive and engaging through personalized interaction and personalization.
- Improving mathematical comprehension: AI contributes to an accurate and detailed explanation of mathematical concepts, enhancing students' understanding. Adapting educational resources:
- Enabling machine learning allows adapting educational resources and exercises according to each student's level and style of learning.
- Stimulate inquiry and critical thinking: AI applications encourage inquiry and the development of critical thinking skills in mathematics topics.
- The applications of AI in mathematics education represent an important progress in improving the quality of education and activating effective interaction between teachers and students.

limitations and Ethical of AI in Math education (AIED)

Ryzheva et al. (2024) point out that AI has provided many opportunities for learning and teaching, but it still requires the guidance of teachers and is not a substitute for them (p. 285). Davis (2024) emphasized that there are limitations of AI in dealing with verbal problems in mathematics. It consists in the lack of clarity of the input at times. Which in turn affects the outputs and the correct solution of problems. Especially if the problem includes graphics, charts, or special symbols depending on the input language used. Hwang (2022) revealed that AI had a low to small effect size on the student's achievement in elementary mathematics in Korea.

There is no doubt about the importance of ethical considerations in implementing AI, including issues related to data privacy, algorithmic bias, and the need for transparent decision-making (Bulger & Barnes, 2018). The recent developments of AI have resulted in a lot of excitement and discussions. Generative AI is discussed chatbots with a large language model (LLM) that can be used to easily create original content. There is also agreement among educational experts on the importance of AI in scientific research and education, especially the use of programs such as ChatGPT in mathematics education, where it can be used to summarize complex texts, expand conceptual knowledge of math concepts, analyze data, and create claims, complete repetitive and time-consuming administrative tasks, etc. However, there are some considerations related to research ethics and academic integrity related to plagiarism. It can also result in impairment in some students' skills, such as critical thinking, problem solving and decision-making (Mohamed et al, 2022).

No discussion on AIED would be complete without mentioning the ethics of incorporating AI into our educational systems. A complete discussion of this is beyond the scope of this study, but we have a new responsibility to ensure that society has sufficient AIED literacy – that is, enough to ensure that we use these new technologies appropriately, effectively, and ethically (Becker, 2017, 45).

Applications of AI in mathematics education

Applications of AI in mathematics education refer to the use of advanced AI techniques, such as machine learning and natural language processing, to improve learning processes and enhance students'

understanding of mathematical concepts. These apps give teachers and students access to interactive, AI-driven tools to provide accurate explanations, personalize educational support, and stimulate mathematical curiosity (Pedro et al., 2019).

GPT is a generative AI-based LLM that understands human language and can process images via the ChatGPT interface. It automatically completes and processes human input (prompt) using stochastic processes (Schorcht et al., 2024). ChatGPT is one of the important applications of AI that appeared during 2022, and it has many contributions to education in general and to mathematics education in particular, and the performance of ChatGPT changes significantly based on the number of calculations and the number of variables and unknowns in the input (Shakarian et al., 2023). ChatGPT should be developed by specialists in mathematics and application programming (Alaswad et al., 2023). (Dao & Le, 2023) provided a complete analysis of ChatGPT's abilities to deal with mathematics, as the study showed that ChatGPT is highly successful in providing answers to questions on topics including exponential and logarithmic functions, geometric progression, and computational progression. The study found that ChatGPT had difficulty correctly answering questions on topics including derivatives, applications, spatial geometry, and spatial calculus. In addition, the results indicated that ChatGPT has the potential to be an effective educational tool for mathematics, but more work is needed to enhance its handling of graphical data and address the challenges posed by increasingly difficult questions. Frieder et al. (2023) indicated that ChatGPT can be used more successfully as a mathematical assistant to query facts, acting as a mathematical search engine and knowledge base interface. But he is underperforming in dealing with passing the math test at the graduate level, so it is better for him to look for another assistant.

AI has changed the rules of the game in many areas, including math. Many AI-powered math solution applications have emerged, providing more than just definitive solutions. They offer step-by-step detailed solutions. This approach helps build a deeper understanding of math concepts and promotes mathematical problem solving and abilities. Through a survey of websites, the best applications for AI math solving available today can be expressed in Figure 2. These applications use advanced algorithms, deal with a range of topics from many branches of mathematics, such as calculus, algebra, and statistics, and provide interactive graphs (Smodin, 2023).

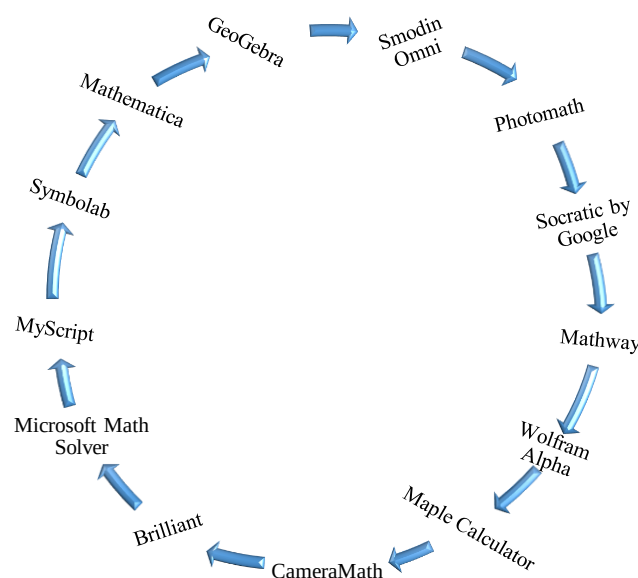


Figure 2. AI applications in math education

Teachers' perceptions of AI

The Teachers' perceptions are so profound that a teacher's performance cannot develop without changing the way he or she thinks and perceives. Perceptions are very important in shaping teachers' beliefs, and they are a lens that transmits what is inside them to the educational reality. We also see the reflections of these perceptions on educational practices. Perceptions have three components: the teacher, the goal that is being perceived, and the situation in which the perception occurs. Each of these components affects the teacher's perception or interpretation of the situation.

Teachers' perceptions of mathematics education issues are necessities that should not be ignored in mathematics education research. Ryu & Han (2018) revealed positive attitudes and perceptions among teachers about the educational uses of AI. The results showed that teachers with high experience in advanced schools believe that AI-based education can help improve creativity. Teachers with more years of teaching experience also showed a higher interest in AI and a higher level of understanding of its connection to the subject matter. One of the most important recommendations of the study is to provide educational programs that focus on increasing teachers' awareness of the educational uses of AI.

Reinhold et al. (2021) indicated that workshop-based in-service teacher training can enhance teachers' perceptions about using of digital media in teaching mathematics, raise their self-efficacy, and reduce their anxiety toward teaching mathematics using digital tools. Wang et al. (2020) explained that there is concern among most teachers regarding the use of AI in education. Shin (2020) aimed to highlight the need for AI in future mathematics education as seen by pre-service math teachers and the role of teachers in the use of AI. Among the most prominent findings of the study, in terms of teaching, teachers said that the use of AI in school mathematics is the need of the moment, and that different types of classrooms can be implemented, and accurate knowledge and information transferred, but there are limitations in cognitive and emotional interaction. In terms of learning, AI also provides individual learning, can be used for complementary learning (lifelong learning) outside the classroom, and can stimulate interest in learning, but it can hinder students' ability to think independently. In terms of assessment, AI is objective, fair and can reduce teachers' work, but it has limitations in written and essay questions and process-oriented assessment. When AI was used, the teacher's role considered by potential teachers was teaching, emotional interaction, informal assessment, and mentorship, and AI's role was individual learning, rote learning, standardized assessment, and administrative work.

Aldarayseh (2023) show a high acceptability of the use of AI in the classroom by science teachers, with positive correlations to self-efficacy, ease of use, expected benefits, attitudes, and behavioral intentions. Park and Kwon (2024) confirmed that the developed AI program was effective in technology education and career exploration. In addition, it was possible to confirm the technological educational value of the AI education program that focuses on solving technological problems. Chounta et al. (2022) exploring teachers' perceptions of AI as a tool to support their practice in Estonian K-12 education. The results indicated that teachers need support to be efficient and effective in their work practice; AI can be used to provide this support. Furthermore, teachers perceived AI as a tool to support them in accessing, adapting, and using multilingual content. Al-Shehri (2023) stressed that there is a medium to high level of awareness among special education teachers of the advantages and possibilities of employing AI applications in solving learning difficulties problems, and the level of emotional and behavioral trends was high.

Chai et al. (2021) recommends teachers to promote self-efficacy and emphasize the potential use of AI for social good. By doing so, students are likely to have a higher appetite for AI learning, and thus can be better prepared for an AI-powered future. Teachers' lack of knowledge of AI is an obstacle to its widespread adoption in schools. Most importantly, understand teachers' willingness and intention to employ AI in education. Therefore, Ayanwale et al. (2022) confirmed an important relationship regarding behavioral intent and AI readiness. Meanwhile, AI anxiety has little to do with teachers' behavioral intentions. Similarly, AI for Social Good does not predict teachers' readiness for AI. So far, the potential of AI has not been fully exploited in mathematics education. To effectively integrate AI into education, Celik (2023) has developed a scale to measure knowledge related to the use of educational AI based on the Technological, Educational and Content Knowledge Framework (TPACK). In addition to the ethical aspects related to AI. The results indicated that if teachers have more knowledge to interact with AI-based tools, they will have a better understanding of the pedagogical contributions of AI. Al-Massad and Al-Farani (2023) showed that the degree of availability of skills for using AI applications in education from the perspective of secondary school teachers in terms of planning, implementation and evaluation was moderate. The results showed that there were statistically significant differences at the level (0.05) regarding the degree of employing AI applications in education from the perspective of secondary school teachers due to the variables (training courses - academic qualification - years of experience). Khawaji (2024) indicated that the level of knowledge and practices of digital skills teachers for AI applications in providing middle school students with digital skills was average. The results indicated that there were no statistically significant differences between the respondents' answers about the use of AI applications in providing middle school students with digital skills due to the variables of academic qualification and years of experience, while there were

statistically significant differences due to the variable of obtaining training programs in the field of AI for the benefit of teachers who have access to training programs.

Antonenko and Abramowitz (2023) have emphasized that some teachers have misconceptions about the concept of AI, such as "AI is just a fad" or "AI is only for tech professionals." Or "AI is expensive" or "AI can be learned automatically". "AI doesn't need humans." Although there were some misconceptions about AI, most of the teachers involved in the study were enthusiastic about integrating AI tools and applications into their own educational practices. Al-Qawabah (2024) showed that in-service teachers need to be trained to use existing AI-based tools more effectively. To integrate AI into mainstream education, teachers must participate in the process of co-designing materials considering contextual conditions and, most importantly, curriculum. Teachers' input during development can help put AI into perspective, leading to tangible impacts and significant educational progress. Zhang et al. (2023) indicated that perceived utility and perceived ease of use were the most important factors influencing pre-service teachers' intentions to use AI technology, with perceived benefit having a greater impact than perceived ease of use. Molefi et al. (2024) looks at the acceptance and use of AI among a sample of 315 in-service teachers in Lesotho City, focusing on the mediating role of school support and resources (SSR). The results reveal a significant positive correlation between perceived benefit and perceived usability and a positive attitude towards AI, with school support playing a pivotal role as a complementary mediator in these relationships. The study highlights the need for ongoing training programs designed to enhance teachers' abilities in the use of AI-based technologies. These programs should not only focus on technical aspects, but also emphasize practical implementation in diverse teaching scenarios.

Methodology

Method

The current study used a mixed methodology of the sequential explanatory type. To answer the outlined research questions, phase one focused on quantitative data collection and analysis from (questionnaire responses), while phase two focused on qualitative data collection and analysis from (Interview tool responses) (Ivankova et al., 2006, p.4).

Creswell (2014) defined mixed methods as methods which "involve combining or integration of qualitative and quantitative research and data in a research study. Qualitative data tends to be open-ended without predetermined responses while quantitative data usually includes closed-ended responses such as those found on questionnaires or psychological instruments" (Creswell, 2014, p.48).

Participants

Table 1.

Demographic information of the Participants (N = 382)

Characteristics	Mathematics teachers							
	Using AI in math education				Not using AI in math education			Total
		Male	Female		Male	Female		
Experience years	Less than 10 years	35	31	66	58	70	128	194
	10 years and more	33	33	66	55	67	122	188
	Total	68	64	132	113	137	250	382

Table 1 showed the demographic information of the participants; male and female middle school mathematics teachers at the Wadi Al-Dawasir Educational Administration in the Riyadh region of the Kingdom of Saudi Arabia during the first semester of the 2024 academic year.

Materials

The questionnaire in this study included five sections covering different aspects: basic data, the extent of the use of AI in mathematics education, the importance of (AI) for mathematics teachers, the importance of AI for students, and the importance of AI in classroom interaction. Teachers were asked to rate their level of agreement with each item on a scale of 1 to 5, where 1 = "strongly disagree" and 5 = "strongly agree".

agree". The questionnaire was written in clear and direct Arabic language to prevent any possible ambiguity. The questionnaire items were drawn from well-established and proven studies in the field of the use of AI in education, such as: Antonenko and Abramowitz (2023), Chai et al. (2021), Chounta et al. (2022) and Khawaji (2024). To ensure the validity of the questionnaire, it was presented to a group of specialists in teaching mathematics, educational technologies and psychology, and the questionnaire items were modified considering their opinions. To ensure the stability of the resolution, it was applied to a sample of mathematics teachers other than the basic sample in the study ($n = 35$) and the reliability coefficient was calculated (Cronbach alpha reliability = 0.872). The questionnaire in its final form consisted of (21) items in addition to the basic data related to math teachers. As shown in table 2, table 3.

Table 2.
Questionnaire sections

The sections		Number of Items
1	Extent of the use of AI in mathematics education.	1
2	The importance of AI for mathematics teachers.	6
3	The importance of AI for students.	6
4	The importance of AI in classroom interaction.	8
Total of items		21

Table 3.
Cronbach's alpha coefficients to measure the reliability of the questionnaire

The sections		Cronbach's Alpha
1	Extent of the use of AI in mathematics education.	0.89
2	The importance of AI for mathematics teachers.	0.86
3	The importance of AI for students.	0.91
4	The importance of AI in classroom interaction.	0.88
Reliability of the questionnaire		0.872

Data collection procedures and ethical consideration

Data were collected from in-service middle school mathematics teachers in the Wadi Al-Dawasir Educational Administration in the Riyadh region of the Kingdom of Saudi Arabia during the second semester of the 2023 academic year. Before data collection, approvals were taken from the university and the Department of Education to apply the research tools to mathematics teachers. Pursuant to Approval No. 4500609622/21-5-1445. Study participants were provided with detailed information about the study objectives, participation, and potential risks or benefits. They were free to decide whether to participate, and their consent was obtained before initiating the study. Personal information and answers were treated with the highest level of confidentiality, and the data was anonymized to ensure that teachers' identities remained protected. In addition, there was a time of about three to four months. This intentional waiting period allowed teachers sufficient time to reflect on their personal experiences with AI applications and apply the newly acquired knowledge and skills into their teaching practices. Furthermore, the study was thoroughly reviewed by the relevant ethics committee associated with the Sattam university to which the researchers are affiliated. The survey link to the study (<https://forms.gle/yFYAMsmJhRq2vxKQ6>) was shared with teachers through various channels, including WhatsApp platforms, to encourage widespread participation.

Statistical Analysis

For the data analysis, the Statistical Package for Social Sciences (SPSS 24.0) was used. The following statistical measures were calculated: Frequencies and percentages of population description for primary data. Cronbach's alpha coefficient) to measure the stability of the search instrument. Mean, to calculate the value given by the study sample on each of the phrases of the study variables and the main section, as well as the order of the statements in terms of the degree of response by Mean (M), Standard Deviation (SD), to identify the extent to which the opinions of the sample members deviate for each phrase of the study variables and for each of the main sections from their Mean. T test, to find out the differences between the responses of the study sample according to gender and experience variables.

Results

In this section, the results of the study are presented, represented by answering the quantitative and qualitative study questions, where the results are displayed in tables and then commented on, followed by a discussion of these results according to the related studies results.

Q1: To what extent do teachers use AI applications in mathematics education?

To answer this question, frequencies, and percentages of the participants' responses were calculated as shown in Table 4.

Table 4.

Responses of study participants about using AI in mathematics education (N = 382)

Do you use AI in mathematics education?	F	%
Yes	132	35%
No	250	65%

Note: F refer to the frequency of responses

Table 4 illustrates that (35%) of math teachers using AI in mathematics education, 65% of them do not rely on AI applications in teaching mathematics.

By conducting interviews with 10 teachers, through Zoom and recording the interviews after the teachers' consent, the responses were analyzed, where the analysis focused on identifying the reasons for the reluctance to use artificial intelligence applications in education despite their recognition of their importance in teaching mathematics, and the study relied on the content analysis method to identify these reasons. The results of the analysis indicated that ((Teacher 1) stated that his use of AI applications is limited to the GeoGebra program for plotting functions in Cartesian coordinates, and to ensure that students solve some problems correctly, and he has no objection to using other techniques that may be useful in teaching mathematics. (Teacher 2) mentioned that he had heard about the use of AI applications, and he had a desire to employ them in teaching specific mathematics lessons. While (Teacher 3) mentioned that he tried to use ChatGPT application in some mathematics lessons, but the Arabic language was an obstacle in obtaining accurate results, especially verbal problems in algebra. Teacher 6 also confirmed that he used ChatGPT application, and it was more useful for mathematical knowledge, but it was not useful for solving problems. (Teacher 4) also mentioned that he tried to experiment with some AI applications in solving geometry problems, but he obtained incorrect results, and this may be because the applications still need to be developed to support the Arabic language.

(Teacher 8) also mentioned that she used the Math Solver website, and it was useful in many lessons. While (Teacher 9) indicated that she used the Desmos application, and it was very useful in drawing functions of all kinds and solving algebraic equations in one variable and more.

Teachers 5, 7, and 10 stated that they use Smodin Omni, it is an AI-based math solver, assists high school students to overcome challenging math problems. The advanced algorithms interpret and solve math problems with speed and accuracy, replacing the usual frustration and confusion associated with math homework. It's a tool for unlocking academic potential. By consistently delivering accurate solutions and promoting a deeper understanding of math concepts. They advise all mathematics teachers to use AI applications available on the Smodin Omni website, depending on the nature of the subject being taught.

Q2: What are teachers' perceptions towards using AI in mathematics education?

To answer this question, Means, standard deviations, and percentages of the participants' responses were calculated as shown in Table 5, Table 6, Table 7.

Table 5.
 Responses of the participants about the importance of (AI) to math teachers (N = 132)

Item			Degree of agreement					M	SD	Agreement	R
			Strongly agree	Agree	Neutral	Disagree	Strongly disagree				
1	AI is suitable for teaching all branches of mathematics	F	0	22	66	44	0	2.83	0.694	Medium	6
		%	0	16.7	50.0	33.3	0				
2	The use of AI applications increases the effectiveness of mathematics education	F	0	88	33	11	0	3.58	0.643	High	4
		%	0	66.7	25.0	8.3	0				
3	AI applications help teachers to plan mathematics lessons	F	0	44	66	22	0	3.17	0.452	Medium	5
		%	0	33.3	50.0	16.7	0				
4	AI contributes to deepening the mathematical concepts in innovative ways	F	22	66	33	11	0	3.75	0.832	High	2
		%	16.7	50.0	25.0	8.3	0				
5	I am interested in developing my skills in using AI in teaching mathematics	F	11	77	33	11	0	3.67	0.748	High	3
		%	8.3	58.3	25.0	8.3	0				
6	I have a desire to use AI in mathematics education	F	44	66	22	0	0	4.17	0.690	High	1
		%	33.3	50.0	16.7	0	0				
Weighted average								3.53	0.491	High	

Note: M refers to the Main, SD refer to standard deviation, and R refer to the rank of item.

Table 5 illustrates that there is agreement between mathematics teachers with a high degree (M = 3.53, SD = 0.491) about the importance of AI to mathematics teachers. The item "I have a desire to use AI in mathematics education" came in the first rank with (M = 4.17, SD = 0.690), and the item "AI contributes to deepening the mathematical concepts in innovative ways" came in the second rank with (M = 3.75, SD = 0.832), the item "I am interested in developing my skills in using AI in teaching mathematics" came in the third rank with (M = 3.67, SD = 0.748), whereas the item "AI is suitable for teaching all branches of mathematics" came in the last rank with (M = 2.83, SD = 0.694).

Table 6.
 Responses of the participants about the importance of AI to students (N = 132)

Item			Degree of agreement					M	SD	Agreement	R
			Strongly agree	Agree	Neutral	Disagree	Strongly disagree				
1	AI contributes to developing students' higher order thinking skills in learning mathematics	F	F	22	88	11	11	3.92	0.762	High	2
		%	%	16.7	66.7	8.3	8.3				
2	Low-achieving students in mathematics benefit from AI applications	F	F	11	55	55	11	3.50	0.767	High	5
		%	%	8.3	41.7	41.7	8.3				
3	AI contributes to stimulating students' mathematical curiosity	F	F	22	66	44	0	3.83	0.690	High	3
		%	%	16.7	50.0	33.3	0.0				
4	Using AI achieves equality and justice in assessing student learning	F	F	0	55	55	22	3.25	0.724	Medium	6
		%	%	0.0	41.7	41.7	16.7				
5	AI applications provide additional support for students with special needs	F	F	33	66	33	0	4.00	0.710	High	1
		%	%	25.0	50.0	25.0	0.0				
6	AI develops positive attitudes among students towards learning mathematics	F	F	11	77	22	22	3.58	0.865	High	4
		%	%	8.3	58.3	16.7	16.7				
Weighted average								3.68	0.475	High	

Table 6 illustrates that there is agreement between mathematics teachers with a high degree (M = 3.68, SD = 0.475) about the importance of AI to students. The item "AI applications provide additional support for students with special needs" came in the first rank with (M = 4.00, SD = 0.710), and the item "AI contributes to developing students' higher-order thinking skills in learning mathematics" came in the second

rank with ($M = 3.92$, $SD = 0.762$), the item "AI contributes to stimulating students' mathematical curiosity" came in the third rank with ($M = 3.83$, $SD = 0.690$), whereas the item "Using AI achieves equality and justice in assessing student learning" came in the last rank with ($M = 3.25$, $SD = 0.724$).

Table 7.

Responses of study participants about the importance of AI in classroom interaction ($N = 132$)

Item			Degree of agreement					M	SD	Agreement	R
			Stro. agree	Agree	Neutral	Disagree	Stro. disagree				
1	Using of AI contributes to building a collaborative environment	F	22	44	44	22	0	3.50	0.961	High	7
		%	16.7	33.3	33.3	16.7	0				
2	AI contributes to providing interactive training that responds to the needs of each student individually	F	11	77	44	0	0	3.75	0.597	High	1
		%	8.3	58.3	33.3	0.0	0				
3	Using of AI systems is useful in analyzing students' performances and understanding their behavior patterns in the classroom	F	11	77	33	11	0	3.67	0.748	High	4
		%	8.3	58.3	25.0	8.3	0				
4	Using of AI applications is useful in providing immediate assistance based on students' performance in classroom interaction	F	11	66	22	33	0	3.42	0.957	High	8
		%	8.3	50.0	16.7	25.0	0				
5	Interactive applications based on AI are useful in improving students' mathematical communication skills	F	22	55	44	11	0	3.67	0.853	High	5
		%	16.7	41.7	33.3	8.3	0				
6	The use of AI applications achieves a balance between the roles of the teacher and students in classroom interactions	F	11	88	22	11	0	3.75	0.724	High	2
		%	8.3	66.7	16.7	8.3	0				
7	Using AI is useful in organizing class time to participate in activities and tasks effectively	F	11	77	33	11	0	3.67	0.748	High	6
		%	8.3	58.3	25.0	8.3	0				
8	Using AI reduces classroom problems between students	F	22	66	33	11	0	3.75	0.832	High	3
		%	16.7	50.0	25.0	8.3	0				
Weighted average								3.65	0.618	High	

Table 7 illustrates that there is agreement between mathematics teacher with a high degree ($M = 3.65$, $SD = 0.618$) about the importance of AI in classroom interaction. The item "AI contributes to providing interactive training that responds to the needs of each student individually" came in the first rank with ($M = 3.75$, $SD = 0.597$), and the item "The use of AI applications achieves a balance between the roles of the teacher and students in classroom interactions" came in the second rank with ($M = 3.75$, $SD = 0.724$), the item "Using AI reduces classroom problems between students" came in the third rank with ($M = 3.75$, $SD = 0.832$), whereas the item "Using of AI applications is useful in providing immediate assistance based on students' performance in classroom interaction" came in the last rank with ($M = 3.42$, $SD = 0.957$).

Q3: To what extent do teachers' perceptions about using AI in math education differ according to the gender variable (Male/ Female)?

H_01 : There is no significant difference between male and female teachers in their perceptions about using AI in math education.

To answer this question, and to verify the validity of the first hypothesis, T-test was calculated for Independent Samples Test as shown in Table 8.

Table 8.
Independent Samples t-test results according to gender variable

	Gender	N	Mean	Std. Deviation	Df	t-test value	Sig. (2-tailed)	Significance
Total Average Items of perceptions	Male	68	3.57	0.3929	130	1.749	0.083	Not significant at 0.05
	Female	64	3.71	0.5254				

Table 8. illustrate that There is no statistically significant difference between the average of the teachers' perceptions about using AI in math education ($\alpha < 0.05$) according to the gender variable (Male/ Female), then we must accept null hypothesis (H_01).

Q4: To what extent do teachers' perceptions about using AI in math education differ according to experience variable (less than 10 years/ from 10 years or more)?

H_02 : There is no significant difference between the experience less than 10 years and experience from 10 years or more in their perceptions about using AI in math education.

To answer this question, and to verify the validity of the second hypothesis, T-test was calculated for Independent Samples Test as shown in Table 9.

Table 9.
Independent Samples t-test results according to gender variable

	Experience	N	Mean	Std. Deviation	Df	t-test value	Sig. (2-tailed)	Significance
Total Average Items of perceptions	Less than 10 years	66	3.56	0.3099	130	1.625	0.107	Not significant at 0.05
	From 10 years or more	66	3.68	0.5426				

Table 9. illustrate that There is no statistically significant difference between the average of the teachers' perceptions about using AI in math education ($\alpha < 0.05$) according to the experience variable (less than 10 years/ from 10 years or more), then we must accept null hypothesis (H_02).

Discussion

The current study is an extension of studies concerned with teachers' perceptions of contemporary educational issues related to teaching mathematics according to AI tools. The middle stage of general education was chosen because of its importance in the educational ladder, as it is the academic stage in which the student is allowed to use educational technologies in learning mathematics, like a calculator. Therefore, the aim of the current study was to reveal the perceptions of middle school mathematics teachers about the use of AI applications in education in the Kingdom of Saudi Arabia. This is an important factor in their success in teaching mathematics and dealing with modern innovations in educational technologies.

The first result indicates a low percentage of teachers who use AI applications in their mathematics teaching practices. By conducting interviews with a sample of them, the reasons for this were revealed, which are that some applications do not accurately support the Arabic language. This result is also due to the weak conceptual background of teachers in using AI. This result is consistent with the study of Ayanwale et al. (2022) who indicated teachers' weakness in conceptual knowledge of AI. It is also consistent with the study of Al-Massad and Al-Farani (2023) which showed that the degree of availability of skills for using AI applications in education from the perspective of secondary school teachers in terms of planning, implementation and evaluation was moderate. While this result is not consistent with Aldarayseh (2023) Which confirmed a high acceptability of the use of AI in the classroom by science teachers. Wardat et al. (2023) showed that ChatGPT lacks a deep understanding of geometry and cannot effectively correct misconceptions.

The second result illustrates that there is agreement between mathematics teacher with a high degree about the importance of AI to mathematics teacher. Evidence of this is a high percentage of teachers' agreement on the following statement: "I have a desire to use AI in mathematics education", and the statement "AI contributes to deepening the mathematical concepts in innovative ways", and the statement "I am interested

in developing my skills in using AI in teaching mathematics". This result is consistent with the study of Molefi et al. (2024) who consider the acceptance and use of AI among a sample of in-service teachers in the city of Lesotho, focusing on the mediating role of school support and resources (SSR), revealed a significant positive relationship between perceived usefulness, perceived ease of use, and positive attitude toward AI. It is also consistent with the study of Wang et al. (2020) which explained that there is concern among most teachers regarding the use of AI in education. Likewise, Shin (2020) study emphasized the need for AI in mathematics education in the future, as seen by mathematics teachers, and among the most prominent findings of the study, teachers said that the use of AI in school mathematics is the need of the moment, and that different types of classrooms can be implemented, and accurate knowledge and information transferred.

The third result illustrates that there is agreement between mathematics teachers with a high degree about the importance of AI to students. Confirming that AI applications provide additional support for students with special needs, and AI contributes to developing students' higher-order thinking skills in learning mathematics. This result is consistent with Chounta et al. (2022) which indicated that teachers perceived AI as a tool to support them in accessing, adapting, and using multilingual content. Likewise, Al-Shehri (2023) stressed the advantages and possibilities of employing AI applications in solving learning difficulties problems, and the level of emotional and behavioral trends was high.

The fourth result illustrates that there is agreement between mathematics teachers with a high degree about the importance of AI in classroom interaction. AI contributes to providing interactive training that responds to the needs of each student individually, and AI applications achieve a balance between the roles of the teacher and students in classroom interactions. Using AI reduces classroom problems between students. This result is consistent with Celik (2023) which indicated that if teachers have more knowledge to interact with AI-based tools, they will have a better understanding of the pedagogical contributions of AI.

The fifth result illustrates that There is no statistically significant difference between the average of the teachers' perceptions about using AI in math education according to the gender variable (Male/ Female). This result may be due to the presence of general agreement among teachers about the importance of AI in mathematics education, regardless of gender difference.

The sixth result illustrate that There is no statistically significant difference between the average of the teachers' perceptions about using AI in math education according to the experience variable (less than 10 years/ from 10 years or more). This result is consistent with the results of the study of Khawaji (2024) and the study of Al-Aiban and Al Qais (2023), where the results showed that there are no statistically significant differences between the average scores of the study sample members' assessment of the degree of possessing the use of AI skills and its impact on the level of quality of educational services through the years of experience variable. While this result differs from the results of the Ryu & Han (2018) study, which found that teachers with a greater number of years of teaching experience have a higher use of AI, and a higher level of understanding of its connection to the academic subject. And the results of Al-Massad and Al-Farani (2023) which showed that there were statistically significant differences at the level (0.05) regarding the degree of employing AI applications in education from the perspective of secondary school teachers due to the years of experience variable.

Conclusion

In the current study, the results of a questionnaire administered to 380 middle school mathematics teachers were analyzed. The results showed that a small percentage of teachers use artificial intelligence in mathematics classes. Despite their belief in the importance of artificial intelligence, which was evident from the results of interviews with a sample of them, some of the underlying reasons for this were the difficulty of dealing with some artificial intelligence applications in Arabic. However, some teachers who used these applications in English language obtained results closer to the truth. Accordingly, the current study recommends developing intensive training programs for mathematics teachers to train them on the techniques of using the most important artificial intelligence applications. However, the current study provided a sample of middle school mathematics teachers' perceptions of the use of AI in education. The study showed that teachers have positive perceptions about AI in relation to teaching practices, student learning styles, changing the typical learning environment, and making it interactive. However, there are some difficulties that have caused some teachers to refrain from using AI applications in teaching mathematics, and this requires conducting more extensive and in-depth studies on these obstacles and how

to overcome them. Based on the results of the study, the researchers recommend the following recommendations and research proposals: It is necessary to hold training programs for middle school teachers on the use of AI applications in math education. The need to raise information awareness about AI through organizing conferences and seminars with the aim of mathematics teachers about the importance of AI in education. Applications of AI should also be included in professional development programs for teachers in mathematics education. Future research should consider teachers' perspectives and perceptions to understand how they employ AI applications to teach mathematics, and what difficulties they face in these teaching practices, in addition to the importance of conducting studies that investigate students' perspectives and impressions about AI.

Ethics statement

The studies involving human participants were approved by the Prince Sattam bin Abdulaziz University and the Department of Education in Wadi Al-Dawasir Governorate, Riyadh Region; to apply the questionnaire with mathematics teachers. Pursuant to Approval No. 4500609622/21-5-1445.

Author contributions

MA: Formal analysis, Resources, Writing – original draft. AA: Writing – review & editing.

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Data sharing statement

Data supporting the findings and conclusions are available upon request from the authors.

Conflict of interest

The authors declare that there is no conflict regarding the publication of this paper.

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Study of factors of prevalence of burnout syndrome among higher education faculty in Latin America

Estudio de factores de prevalencia del síndrome de Burnout en Docentes de educación Superior en Latinoamérica

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Abstract

This study examines the prevalence of burnout syndrome subscales—emotional exhaustion, depersonalization, and personal accomplishment—among university educators in six Latin American countries, conducted during the first semester of 2024. A three-factor ANOVA test with interaction was conducted to analyze significant differences in the level of burnout across the three representation scales, six countries, male and female sexes, and the interactions among the three factors. A diverse sample of 240 university professors, aged between 24 and 57 years, was collected. A significant difference in the level of burnout by country was found. Mexico $\bar{x}_M=46.92$ and Colombia $\bar{x}_C=45.25$ exhibit burnout levels that exceed the general average $\bar{x}_G=46.92$, while Ecuador $\bar{x}_E=38.75$ and Peru $\bar{x}_P=40.83$ manifest averages

Resumen

Este estudio analiza la prevalencia de las tres escalas representativas del síndrome de burnout; agotamiento emocional, despersonalización y realización personal en Docentes universitarios en 6 países latinoamericanos, realizado el primer semestre del año 2024. Se realizó una prueba ANOVA de tres factores con interacción, analizando diferencias significativas en el nivel de Burnout entre las tres escalas de representación, los seis países, géneros masculino y femenino, y la interacción de los tres factores. Se obtuvo una muestra heterogénea de 240 Docentes Universitarios. Se encontró una diferencia significativa en el nivel de burnout entre los diferentes países. México $\bar{x}_M=46.92$ y Colombia $\bar{x}_C=45.25$ presentan un nivel de burnout superior al promedio general $\bar{x}_G=46.92$, mientras que Ecuador $\bar{x}_E=38.75$ y Perú $\bar{x}_P=40.83$ presentan un promedio

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that fall below $\bar{x}_G$. Educators in Ecuador display a markedly lower level of burnout on the emotional exhaustion scale $\bar{x}_{EE}=33.25$ and a higher level on the personal accomplishment scale $\bar{x}_{EA}=45.5$. In Chile and Colombia, lower levels are noted on the personal accomplishment scale $\bar{x}_{HA}=33.75$ and $\bar{x}_{CA}=40$, respectively. It is concluded that while the work context of teachers in Latin America may appear uniform, a notable disparity exists in the prevalence of Burnout syndrome, this variation may indicate differing working conditions or coping mechanisms employed by teachers in each nation. The study is limited on examining the interaction of burnout subscales across six countries and gender, not all Latin American countries along with some important demographic and contextual variables are considered for the complete analysis of the prevalence of Burnout Syndrome. Investigating the impact of burnout on university educators in Latin America is important, as this region faces educational challenges and demands physically and mentally resilient teachers. These educators play a crucial role in shaping the future generations of professionals who will enter the workforce and contribute to the region's development.

Keywords: Burnout syndrome, occupational fatigue, stress, educators, higher education.

menor que $\bar{x}_G$. En Ecuador se observa un nivel inferior de burnout en la escala de agotamiento emocional $\bar{x}_{EE}=33.25$ y un nivel superior en la escala de realización personal $\bar{x}_{EA}=45.5$. En Chile y Colombia, se calcularon promedios inferiores en la escala de realización personal $\bar{x}_{HA}=33.75$ y $\bar{x}_{CA}=40$, respectivamente. Se concluye que, no obstante, el contexto laboral de los docentes en Latinoamérica podría parecer similar, se encuentra una diferencia significativa en la prevalencia del síndrome de Burnout, lo cual podría revelar que existen condiciones diferentes de trabajo o afrontamiento de las mismas para los docentes en cada país. El estudio se limita a analizar la interacción de las subescalas de burnout en seis países de Latinoamérica y el sexo; y no se incluyen todos los países latinoamericanos ni algunas variables demográficas y contextuales importantes para un análisis exhaustivo de la prevalencia del síndrome de burnout. Analizar el impacto del Burnout en Docentes Universitarios latinoamericanos es relevante pues, al ser una región rezagada educativamente, requiere de Maestros aptos física y mentalmente dado su labor de formadores de las futuras generaciones de profesionistas que estarán en el mercado laboral y guiarán el desarrollo de la zona.

Palabras clave: Síndrome de burnout, agotamiento laboral, estrés, docentes, educación universitaria.

Introduction

Background

Feeling fatigued from work has been identified as a syndrome comprising physical symptoms, emotions, and behaviors that arise in response to the circumstances, conditions, environments, and characteristics associated with professions involving personal interaction or service, commonly referred to as Burnout Syndrome. (Olivares, 2016), (Gil-Monte, 2003; Marsollier, 2013; Salanova & Futuros, 2008; Manassero et al., 2005).

Justification

At present, higher education professionals in Latin America operate within an environment characterized by significant work demands, which adversely impacts their performance. This situation manifests in various intrapersonal, physical, psychological, emotional, and behavioral effects, while also directly influencing interpersonal dynamics, particularly within the teaching-learning process. Consequently, it undermines the quality of education in interactions with students and other members of the educational community.

Methods

This study seeks to identify the most prevalent factors contributing to Burnout Syndrome among higher education instructors in six Latin American countries, specific objectives encompass to identify the predominant factors of Burnout Syndrome (Emotional Exhaustion, Depersonalization, or Personal Accomplishment) among higher education instructors in each country examined, to understand the similarities and differences concerning which factors predominate in the analyzed countries, to ascertain whether there is a higher prevalence of any factor overall in Latin America, and to ascertain the correlation between the prevalence of Burnout syndrome and factors such as country or sex.

Structure

Initially, the concepts and background of previous research on Burnout syndrome are outlined, followed by a detailed description of the study design. This includes the sampling method employed for data collection and the analytical approach utilized to assess significant differences in the level of Burnout among the studied population, specifically a three-factor ANOVA test with interaction, applied to a sample of Latin American university educators. Subsequently, the results are presented and interpreted, leading to the conclusions and discussion of the study. Notably, the findings indicate significant differences in the prevalence of Burnout syndrome among the individuals examined.

Theoretical Framework

Although the term "Burnout" was first introduced by Freudenberger in 1974 to describe the "physical and emotional fatigue experienced by volunteers at a detoxification clinic" (Freudenberger, 1975) (Olaya Arevalo, 2015), it was later defined in 1981 by Maslach and Jackson as a consequence of work-related stress, primarily observed in individuals engaged in service-oriented professions who operate in high-demand social environments; such as teachers, doctors, nurses, and volunteers (Olaya Arevalo, 2015).

As a result of research on stress conducted in the 1970s, the term "Burnout" emerged in the initial studies of Freudenberger in 1974 and Maslach in 1976, framed within a social psychological perspective. It is conceptualized as a syndrome characterized by emotional exhaustion and cynicism, which frequently affects individuals engaged in work involving interpersonal interactions. Consequently, during this period, studies on burnout proliferated, leading to references focused on various helping professions, particularly highlighting research related to educational professionals (Marques Pinto et al., 2005). However, it was not until the 1980s that a significant increase in research on Burnout Syndrome (BS) became evident.

The conceptualization of the term "stress" remains one of the most contentious issues in psychology, both in terms of its definition and theoretical interpretation (Cazalla-Luna & Molero, 2015). In contrast, the concept of Burnout Syndrome has been defined and accepted almost unanimously by experts in the field, based on Maslach's formulation, which characterizes burnout as a chronic stress response comprising three essential components: emotional exhaustion, depersonalization, and diminished personal accomplishment. (Enache & Călin, 2014).

One of the critical factors to be examined in Burnout Syndrome is the heightened sense of emotional exhaustion (Maslach, 2023). Currently, exhaustion is recognized as a sustained reaction to chronic stressors and interpersonal dynamics within the workplace (Squillaci, 2021).

Burnout Syndrome is defined as a condition characterized by emotional and physical exhaustion resulting from prolonged exposure to emotionally taxing situations. (Wefald et al., 2012). Conversely, SB is regarded as a combination of emotional and physical fatigue triggered by diverse work demands, highlighting organizational factors that require continuous emotional, cognitive, and physical exertion from the employee. (Torkelson & Muhonen, 2008) (McClenahan et al., 2007).

Burnout syndrome is directly linked to occupational stressors, defined as circumstances related to job performance that generate tensions stemming from the disparity between job demands and workers' perceptions of their capacity to effectively manage those demands (Bakker & Demerouti, 2013).

In the 1980s, Maslach and Jackson introduced a tool for assessing burnout: the Maslach Burnout Inventory (Leka et al., 2005). This instrument has become the most widely utilized tool for evaluating burnout syndrome (BS). They subsequently developed the MBI-Educators Survey (MBI-ES), a version of the original MBI tailored for educators, encompassing teachers, administrators, other staff members, and volunteers in various educational environments (Faraci, 2018).

Burnout among university educators has been studied since the 1990s, focusing on its impact on working conditions (Faraci, 2018) (Ms. Rashmi Ram Hunnur, 2013) and the repercussions of burnout on health, as well as its influence on the effectiveness and efficiency of teachers' work performance and student outcomes (González-Romá et al., 2006).

Research on predictors of burnout among university professors has identified specific stressors that can lead to emotional exhaustion and diminished job satisfaction, including low salaries, high work pressure, insufficient social recognition, contentious relationships with students' parents, conflicts within the workplace, teaching multiple subjects with demanding schedules, and issues related to learning difficulties and aggressive behavior in students (Skaalvik & Skaalvik, 2015) (Zhylin et al., 2023)

University educators are obligated to engage in a range of activities focused on research, teaching, and scientific production projects, while also fulfilling administrative responsibilities such as planning academic, cultural, and scientific initiatives, managing courses, and organizing scientific dissemination and outreach activities for their academic community (Fiorilli et al., 2017).

In this context, there exists a correlation between the deteriorating working conditions in higher education institutions across Latin America and the demands placed on university professors, leading to emotional, behavioral, and physical exhaustion among educators (Sestili et al., 2018).

Since the 2000s, there has been a notable increase in interest regarding research on burnout among university educators (Sestili et al., 2018). Specific negative determinants that disrupt the work-life balance of university faculty have been identified, including prolonged working hours and heightened work intensity (Collado et al., 2016), alongside elevated stress levels stemming from time constraints, inadequate compensation, excessive workloads, job insecurity, and diminished clarity regarding role expectations (Walsh et al., 2020). These findings corroborate studies that link work-related stress to burnout syndrome among academic personnel (Poalses & Bezuidenhout, 2018) (Salazar Manosalvas et al., 2022).

Research on Burnout Syndrome have primarily concentrated on determining the presence of the syndrome or its various dimensions within specific professions. Notable studies include those conducted by Guevara, Henao, and Herrera in 2002 in Colombia, as well as the research by Tisiotti and Parquet in 2007 and Zaldúa, Bottinelli, Pawlowicz, and Nabergoi in 2007 in Argentina, along with Briones' work in 2007 in Chile. Additionally, Aldrete and Preciado's studies in 2008 not only assess burnout levels but also aim to establish correlations with sociodemographic variables such as gender, age, and marital status, among others. (Díaz Bambula & Gómez, 2016).

Currently, research on burnout has become increasingly significant in Latin America, acknowledged as a health issue associated with psychosocial risks in the workplace (Gil-Monte, 2003). It is understood that the study of burnout has progressed, being recognized as a health concern prevalent in various work environments, rather than being confined solely to the caregiving professions, which have received the most scrutiny. It is acknowledged that the responsibility does not rest solely with the individual; rather, it is a phenomenon that emerges from the interaction between the worker and their work environment within the relational context.

It is crucial to expand the understanding of the syndrome by considering the specific social and economic context, with the objective of examining both the interplay between work and health and the broader societal implications. Achieving this, requires the engagement of various disciplines, enabling a paradigmatic shift that facilitates a more comprehensive analysis of issues related to occupational mental health, thereby enhancing its understanding. (Díaz Bambula & Gómez, 2016) (Caldichoury-Obando et al., 2024).

In Latin American countries, contextualized conceptual models of burnout have yet to be developed. This gap is evident in the reliance on theories and measurement methods established in industrialized nations, neglecting the unique characteristics of work and health dynamics in this region. While Latin American societies operate within a capitalist framework, their economic and labor processes adhere to a distinct rhythm shaped by multiple factors. (Mohammed et al., 2020).

It is essential to examine the social and professional landscape of Latin American university educators, considering the specific parameters of the studied group in this instance, Latin America, while acknowledging the hybridization of Western and non-Western cultures. Although technology and globalization have fostered cultural exchange and diverse influences, rendering this phenomenon increasingly apparent, it is imperative to exercise caution and refrain from treating different contexts as homogeneous. (Caldichoury-Obando et al., 2024).

It is important to note that there are ongoing conceptual debates surrounding the Syndrome, as the notion of burnout is practically synonymous with the Maslach Burnout Inventory (MBI), and vice versa. (González-Romá et al., 2006) and (Olivares, 2016) emphasize that the MBI's strengths include its broad international acceptance, empirical support for its factorial structure, and evidence of concurrent and divergent validity. Nonetheless, they also identify several weaknesses of the questionnaire, including issues related to its conceptual scope, challenges in operationalizing the concept, ambiguity in symptom definitions, unclear wording in certain translations, limited public awareness of the instrument due to its commercial application, problems with the conceptual scope of emotional exhaustion, lack of discriminant validity, and difficulties associated with diagnostic standards. (Benkova et al., 2022).

Methodology

Research Design

A factorial study employing a three-factor design with interaction was conducted to examine the prevalence of predominant factors associated with Burnout Syndrome among higher education faculty in six Latin American countries during the first half of 2024. The research aimed to identify the primary subscales of Burnout Syndrome (emotional exhaustion, depersonalization, or personal accomplishment) in each country analyzed, while also distinguishing the similarities and differences in the prevalence of each factor across the countries. Furthermore, the study investigated the predominant prevalence of any specific factor in a generalized or recurrent manner throughout Latin America, as well as sought to determine whether a correlation exists between the prevalence of Burnout Syndrome and the variables of country and sex.

The study was conducted using a cross-sectional observational design and a hybrid sampling method, calculating the F statistic to estimate the significance level of the factors contributing to Burnout syndrome.

Based on the implementation of a three-factor design with interaction, the study examined the presence of significant differences in Burnout levels across the three representation scales, the six countries, and between male and female sexes. Consequently, the following sets of hypotheses were proposed:

For the Burnout representation subscales, Factor A:

H_0 = *There is no difference in the means of burnout of the three subscales*

H_1 = *There is a significant difference in the mean of at least one subscale*

For nationalities, factor B:

H_0 = *There is no difference in the means of burnout of the six nationalities*

H_1 = *There is a significant difference in the mean of at least one nationality*

For sex, factor C:

H_0 = *There is no difference in the means of burnout between men and female*

H_1 = *There is a significant difference in the means of men and female*

For the Subscale - Nationality interaction, A - B:

H_0 = *There is no significant interaction between subscales and nationalities*

H_1 = *There is a significant interaction between subscales and nationalities*

For the Subscale - Sex interaction, A - C:

H_0 = *There is no significant interaction between subscales and sexes*

H_1 = *There is a significant interaction between subscales and sexes*

For the Country - Sex interaction, B - C:

H_0 = *There is no significant interaction between nationalities and sexes*

H_1 = *There is a significant interaction between nationalities and sexes*

For the interaction scale - country - sex, A - B - C:

H_0 = *There is no significant interaction between the three factors*

H_1 = *There is a significant interaction between the three factors*

Data collection

Data collection was based on a hybrid sampling method, resulting in a heterogeneous sample. Professors from six public universities across six Latin American countries: Mexico, Colombia, Brazil, Peru, Ecuador, and Chile were invited to participate via email. A total of 520 emails were dispatched, with 415 individuals responding to the questionnaire (response rate = 79.8%). Among these, 286 reported experiencing symptoms of Burnout Syndrome (adherence rate = 68.9%). Ultimately, 240 teachers were randomly selected who consented to participate voluntarily in the study, aligning the number with the experimental design employed. The final sample comprised 240 university educators aged between 24 and 67 years, with a mean age of 42 years.

The sample comprised 50.0% women and 50.0% men, with 20 women and 20 men from each country. All participants possessed higher education; 53.3% held a bachelor's degree, totaling 128 individuals, 21.7% had a master's degree, amounting to 52 individuals, and 25.0% held a doctorate, comprising 60 individuals. The inclusion criteria stipulated that all survey participants had a minimum of two years of continuous teaching experience at the time of the study.

The methodological study employed a cross-sectional observational design which was conducted between January 1 and June 30, 2024. The sample inclusion-exclusion criteria were as follows: The total sample consisted of Participants who possessed a minimum of two years of uninterrupted teaching experience at the time of the study and were previously diagnosed with Burnout Syndrome, as determined by the Maslach Burnout Inventory, specifically the MBI-Educators Survey (MBI-ES): (Olivares, 2016), (Faraci, 2018).

This version of the original MBI is tailored for educators, encompassing teachers, administrators, other staff members, and volunteers within any educational setting. It evaluates three scales: 1- Emotional exhaustion, which assesses feelings of being emotionally overwhelmed and fatigued by work; 2- Depersonalization, which gauges an insensitive and impersonal attitude towards students; and 3- Personal accomplishment, which measures feelings of competence and successful achievement in the workplace. The exclusion criteria included having less than two years of continuous teaching experience and not exhibiting symptoms of Burnout Syndrome.

To create the sample, a demographic questionnaire was employed, gathering in-formation regarding the workers' sex, age, job position, years of service, and weekly working hours.

The Maslach Burnout Inventory (MBI) questionnaire consists of 22 items presented as statements regarding professionals' feelings and attitudes toward their work and students, it is used to evaluate professional burnout. Respondents provide answers to the 22 self-report questions using a 7-point Likert scale that reflects the frequency with which they identify with each statement. This assessment aims to gauge both the frequency and intensity of experienced burnout. It evaluates the three dimensions of burnout syndrome:

1. Emotional exhaustion subscale evaluates the experience of being emotionally drained by work-related demands. It comprises 9 questions (1, 2, 3, 6, 8, 13, 14, 16, 20). The maximum score is 54.
2. Depersonalization subscale. This subscale evaluates the extent to which individuals perceive cold and distant attitudes, as well as measures an insensitive and impersonal response towards students. It consists of 5 items (5, 10, 11, 15, 22). The maximum score is 30.
3. Personal accomplishment subscale. This subscale evaluates perceptions of self-efficacy and personal achievement in the workplace. It comprises 8 items (4, 7, 9, 12, 17, 18, 19, 21). The maximum score is 48.

Ethical principles

This research received approval from the Thesis Committee of the Doctoral Program in Systems Engineering at Instituto Politécnico Nacional, Zacatenco Node, Mexico. All procedures were conducted in accordance with applicable ethical standards and regulations. Informed consent was secured from all

participants, and their anonymity was preserved. The data collection method was selected to ensure that the workplaces of the participants could not be identified.

Data Analysis

The assessment of this inventory is conducted through the analysis of three numerical variables, defined by the following thresholds: low Emotional Exhaustion, ≤ 18 ; medium Emotional Exhaustion, 19-26; and high Emotional Exhaustion, ≥ 27 ; low Depersonalization, ≤ 5 ; medium Depersonalization, 6-9; and high Depersonalization, ≥ 10 ; as well as low Personal Accomplishment, ≤ 33 ; medium Personal Accomplishment, 34-39; and high Personal Accomplishment, ≥ 40 .

The Emotional Exhaustion and Depersonalization subscales reflect a greater level of burnout associated with higher scores. Conversely, the Personal Accomplishment subscale should be interpreted in the opposite manner, indicating a greater level of burnout with lower scores. Collectively, these three subscales characterize the syndrome of physical and mental exhaustion as a continuous variable that can manifest at varying degrees and intensities. It is important to note that, clinically, there are no definitive cut-off scores to determine the presence of Burnout; however, a combination of elevated scores in Emotional Exhaustion and Depersonalization, alongside lower scores in Personal Accomplishment, delineates Burnout Syndrome. The syndrome is deemed prevalent if at least one of the subscales exhibits high levels in its score. (Faraci, 2018) (Olivares- Faúndez et al., 2014).

To calculate the Burnout score, the values obtained in each item presented in table 1, are added:

Table 1.
Items associated with each subscale

Subscale	Items	Burnout indicator
Emotional exhaustion	1-2-3-6-8-13-14-16-20	26 or more
Depersonalization	5-10-11-15-22	9 or more
Personal accomplishment	4-7-9-12-17-18-19-21	Fewer than 34

Source: Compiled by the authors based on Maslach (2023)

High scores on the initial two subscale and low scores on the third subscale characterize Burnout Syndrome. A thorough analysis of the various aspects is essential to ascertain the Degree of Burnout Syndrome, which may vary in severity based on the manifestation of signs across one, two, or three scales, as well as the reference values indicative of the syndrome, which are described in table 2. This examination of aspects and items can offer insights into the strengths and weaknesses of individuals in their teaching roles.

Table 2.
Burnout reference values

Subscale	Low	Moderate	High
Emotional exhaustion	0 – 18	19 – 26	27 – 54
Depersonalization	0 – 5	6 – 9	10 – 30
Personal accomplishment	40 – 56	34 – 39	0 – 33

Source: Compiled by the authors based on (Maslach, 2023)

To facilitate a valid comparison of the burnout levels derived from each scale, the results were converted proportionally. For emotional exhaustion and depersonalization subscale, conversion was performed directly; conversely, for the personal accomplishment scale, conversion was conducted inversely, as a low score on this scale indicates a high level of burnout, in contrast to the other two scales. The variables that were analyzed, which are included in the MBI, were: sex, age, place of residence, professional seniority, teaching experience, and type of work activity.

Statistical Analysis

A three-factor ANOVA test with interaction was conducted, by the calculation of the F test statistic, which compares the variance derived from each factor (burnout subscales, sex and nationality) and their

interactions against Error variance MSE. If the variance associated with a specific factor is significantly greater than the error variance, it is concluded that there exists a significant difference in the levels of burnout observed at each level of that factor. Similarly, if the variance resulting from the interaction of two or more factors is significantly greater than the error variance, it is inferred that a significant interaction exists among those factors, indicating that the combination of two or more specific factors may yield higher or lower levels of burnout as a result of that combination. Table 3 presents the model.

Table 3.
Three-Way Factorial Design with Interaction.

Source of variation	Sum of squares	Degree of freedom	Variance	F value
Burnout subscales Factor A	SSA	$a - 1$	$MSA = \frac{SSA}{a - 1}$	$F_A = \frac{MSA}{MSE}$
Nationality Factor B	SSB	$b - 1$	$MSB = \frac{SSB}{b - 1}$	$F_B = \frac{MSB}{MSE}$
Sex Factor C	SSC	$c - 1$	$MSC = \frac{SSC}{c - 1}$	$F_C = \frac{MSC}{MSE}$
Interaction Subscale-Nationality	SSAB	$(a - 1)(b - 1)$	$MSAB = \frac{SSAB}{(a - 1)(b - 1)}$	$F_{AB} = \frac{MSAB}{MSE}$
Interaction Subscale – Sex	SSAC	$(a - 1)(c - 1)$	$MSAC = \frac{SSAC}{(a - 1)(c - 1)}$	$F_{AC} = \frac{MSAC}{MSE}$
Interaction Nationality-Sex	SSBC	$(b - 1)(c - 1)$	$MSBC = \frac{SSBC}{(b - 1)(c - 1)}$	$F_{BC} = \frac{MSBC}{MSE}$
Interaction Three factors	SSABC	$(a - 1)(b - 1)(c - 1)$	$MSABC = \frac{SSABC}{(a - 1)(b - 1)(c - 1)}$	$F_{ABC} = \frac{MSABC}{MSE}$
Error	SSE	$n - (abc)$	$MSE = \frac{SSE}{abc(n - 1)}$	
Total	SStotal	$n - 1$		

Source: Compiled by the authors.

Where variables $a = 3$, $b = 6$, $c = 2$, denote the number of levels for each factor, specifically 3 burnout representation scales, 6 nationalities, and 2 sexes, $n = 720$ is the total number of observations. Variables SS represent the sum of squared differences: total $SStotal$ (1); for factor A, subscales of burnout, SSA (2); for factor B, nationalities, SSB (3); for factor C, sexes, SSC (4); for the interaction subscale-nationality, A-B, $SSAB$ (5); for the interaction subscale-sex, A-C, $SSAC$ (6); for the interaction nationality-sex, B-C, $SSBC$ (7); for the three factor interaction, A-B-C, $SSABC$ (8), and variable SSE represents the sum of squared differences of Error.

$$SStotal = \sum_{i=1}^a \sum_{j=1}^b \sum_{k=1}^c \sum_{l=1}^n x_{ijkl}^2 - \frac{x^2}{abcn} \quad (1)$$

$$SA = \frac{1}{bcn} \sum_{i=1}^a x_i^2 - \frac{x^2}{abcn} \quad (2)$$

$$SSB = \frac{1}{acn} \sum_{j=1}^b x_j^2 - \frac{x^2}{abcn} \quad (3)$$

$$SSC = \frac{1}{abn} \sum_{k=1}^c x_k^2 - \frac{x^2}{abcn} \quad (4)$$

$$SSAB = \frac{1}{cn} \sum_{i=1}^a \sum_{j=1}^b x_{ij}^2 - \frac{x^2}{abcn} - SSA - SSB \quad (5)$$

$$SSAC = \frac{1}{bn} \sum_{i=1}^a \sum_{k=1}^c x_{ik}^2 - \frac{x^2}{abcn} - SSA - SSC \quad (6)$$

$$SSBC = \frac{1}{an} \sum_{j=1}^b \sum_{k=1}^c x_{jk}^2 - \frac{x^2}{abcn} - SSB - SSC \quad (7)$$

$$SSABC = \frac{1}{n} \sum_{i=1}^a \sum_{j=1}^b \sum_{k=1}^c x_{ijk}^2 - \frac{x^2}{abcn} - SSA - SSB - SSC - SSAB - SSAC - SSBC \quad (8)$$

$$SSE = SStotal - SSA - SSB - SSC - SSAB - SSAC - SSBC \quad (9)$$

The responses from the 240 teachers surveyed across the three levels of burnout to be analyzed yield a total of 720 data points, distributed as follows: 40 teachers per country and 20 teachers per sex per country, resulting in a total of 20 replications for the experiment.

Results and Discussion

Overview of the Respondent Group

In the present study, 240 university professors from six Latin American countries—Mexico, Colombia, Brazil, Peru, Ecuador, and Chile—participated, with ages ranging from 24 to 57 years (mean age: 42 years). The sample comprised 50% ($n = 120$) women and 50% ($n = 120$) men. All participants possessed higher education qualifications; 53.3% held a bachelor's degree, 21.7% a master's degree, and 25.0% a doctoral degree. Each survey participant had a minimum of two years of teaching experience at the time of the study. The entire sample had been previously diagnosed with Burnout Syndrome according to the Maslach Burnout Inventory, specifically the MBI-Educators Survey (MBI-ES), which is a version of the original MBI tailored for educators, including teachers, administrators, other staff members, and volunteers in various educational settings (Olivares, 2016).

ANOVA test results

Table 4 presents the results of the ANOVA tests solved in Minitab at a significance level $\alpha = 0.05$.

It can be observed that, in the subscales test (Factor A), sex (Factor C), and the interactions scale-sex (A-C), country-sex (B-C), and scale-country-sex (A-B-C), the value of the test statistic F is below the critical value at a significance level of $\alpha = 0.05$. Consequently, the following conclusions are drawn:

- Subscale test: No significant difference in the degree of burnout was observed among the three representation scales, $p - value = 0.293$. This indicates that the surveyed teachers exhibit consistent levels of burnout across the three scales (Emotional exhaustion, Depersonalization, and Personal accomplishment).
- Sex test: There is no significant difference in the level of burnout exhibited by both sexes, men and women, $p - value = 0.082$.
- Scale-sex interaction test. No significant interaction was found between burnout scales and sexes, yielding a $p - value = 0.121$.
- Nationality-sex interaction analysis: There is no significant interaction observed between countries and sexes, $p - value = 0.536$.
- Three-factor interaction test: No significant interaction exists among the three factors: burnout scales, countries, and sexes, $p - value = 0.483$.

Table 4.
ANOVA test results

Factor	Levels	Values				
SUBSCALE	3	Emotional exhaustion, Depersonalization, Personal accomplishment				
NATIONALITY	6	Brasil, Chile, Colombia, Ecuador, Mexico, Peru				
SEX	2	Male, Female				
Analysis of variance	DF	Adj SS	Adj MS	F-Value	Critical value	p-Value
Source of variation						
SUBSCALE	2	477.17	238.59	1.27	3.01	0.293
NATIONALITY	5	6866.38	1373.28	7.31	2.23	0.000
SEX	1	601.16	601.16	3.20	3.86	0.082
SUBSCALE*NATIONALITY	10	11816.55	1181.67	6.29	1.84	0.000
SUBSCALE*SEX	2	841.62	420.81	2.24	3.01	0.121
NATIONALITY*SEX	5	779.63	155.93	0.83	2.23	0.536
SUBSCALE*NATIONALITY*SEX	10	1822.27	182.23	0.97	1.84	0.483
Error	684	128498.01	187.86			
Total	719	151702.79				

Source: Compiled by the authors.

Analysis of significant factors

- Conversely, in the tests concerning countries (Factor B) and the interaction between countries and the burnout scale (A - B), an F value exceeding the critical threshold is computed, leading to the following conclusions:
- Nationality test: The average burnout value of at least one country significantly differs from the others, resulting in a p - value ≈ 0 .
- Nationality - subscale interaction test: A significant interaction exists between the burnout representation scales and the nationalities, indicating that the combination of at least one scale with a nationality, results in markedly different levels of burnout, resulting a p - value ≈ 0 .

Figure 1 presents the Pareto chart of the standardized effects. It is evident that factor B (Nationalities), along with the interaction of factors A and B (subscale – nationality), represent the greatest effects at a significance level $\alpha = 0.05$.

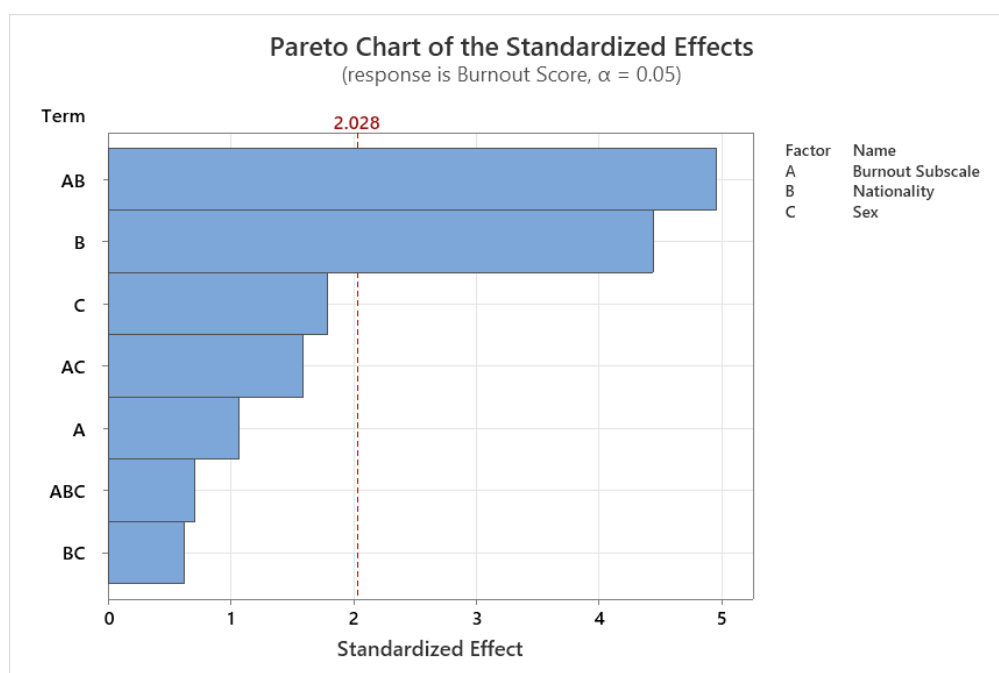


Figure 1. Pareto chart of the standardized effects.

Source: Compiled by the authors.

Upon examining the main effects graphs depicted in Figure 2, it is evident that the three scales (Factor A) and both sexes (Factor C) do not exhibit average burnout levels that significantly deviate from the overall average. Additionally, it is noteworthy that in Mexico and Colombia, average burnout levels are markedly higher than the general average by country, while in Ecuador and Peru, the calculated averages fall below the general average.

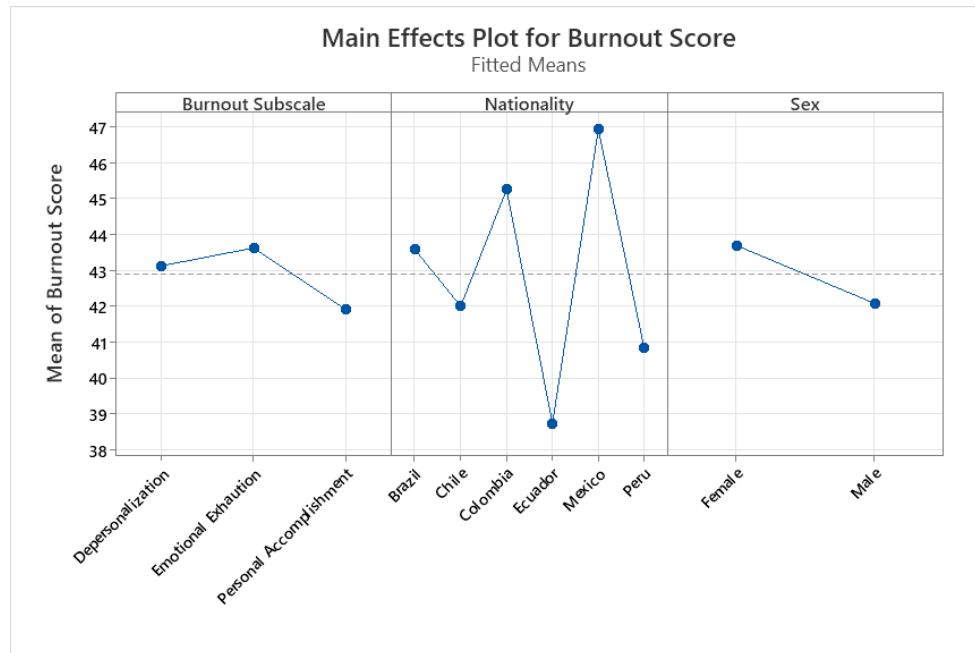


Figure 2. Main effects plot for burnout levels.
Source: Compiled by the authors.

Analysis of interactions

Figure 3 illustrates the interaction graphs, revealing that the primary interactions are as follows:

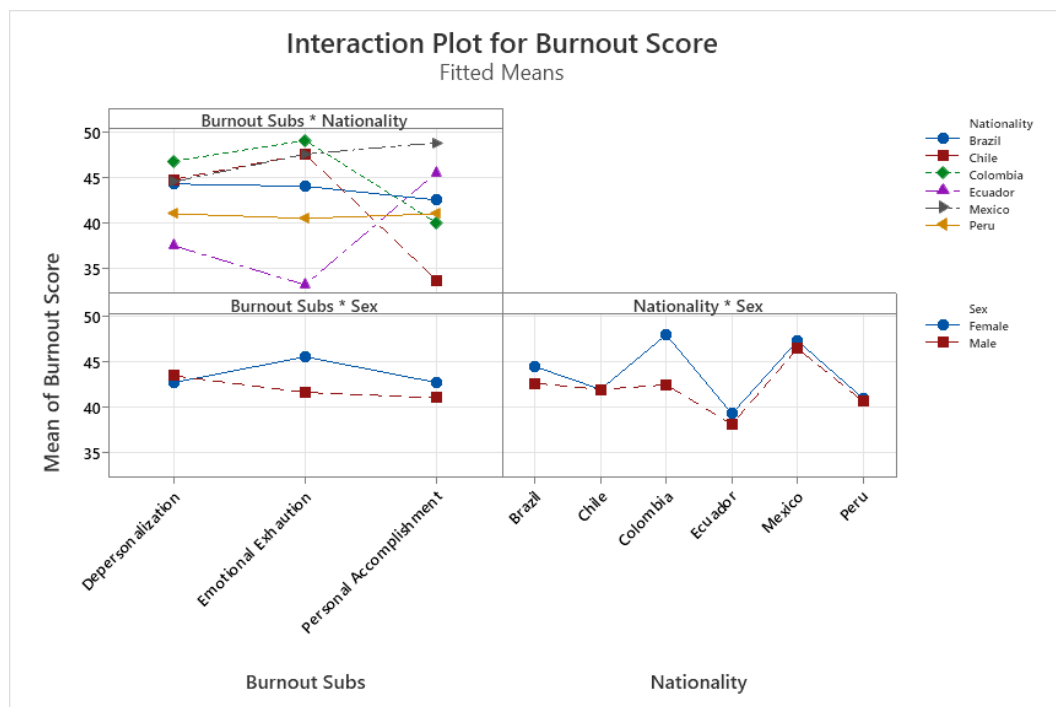


Figure 3. Interaction plot for burnout levels.
Source: Compiled by the authors.

The teachers surveyed in Ecuador exhibit a notably lower level of burnout on the emotional exhaustion scale and a higher level on the personal accomplishment scale.

In Chile and Colombia, significantly lower levels are noted on the personal achievement scale in comparison to the other two scales.

The role of the university professor is crucial in enhancing educational quality. In addition to helping students develop professional skills, they contribute to national development. Their work, both directly and indirectly, influences the development and growth of the society in which they develop their educational function.

It is widely recognized that a country's progress and evolution are directly and proportionally correlated with the advancement of science and technology, which stems from the research conducted by its human talent. Consequently, investing in this area will yield substantial benefits for society.

It is essential to recognize that the university educator is a professional who requires ongoing social interaction with students, fellow professors, professional staff, business leaders, and others.

Educators are uniquely distinguished among professionals in other fields, as they are daily compelled to engage in human relationships characterized by direct and specialized attention, this role inherently involves the subjectivity of the human psyche. As interactions occur with students, professional staff, parents, and the broader community, as well as with family members in a direct manner, such interactions are often overlooked in contrast to other professions where work is predominantly dictated by the use of inanimate tools, such as computers, mechanical devices, and plans. This necessitates the management of both personal and others' emotions, requiring a nuanced understanding of interpersonal and intrapersonal intelligences in a highly specific context (Cota et al., 2022).

University professors must possess emotional intelligence and strong interpersonal skills. Additionally, they are required to collaborate in resolving daily conflicts within the academic community, which suggests that they may be adversely affected intrapersonally.

The educator must manage time effectively, by addressing workload scenarios, including planning academic activities, preparing instructional materials, designing assessments, reviewing assignments, and engaging in institutional activities, among other commitments that occupy both work and personal time.

The necessity for immediate adaptation, coupled with a consistent level of demand, presents challenges that higher education instructors encounter daily. These factors undoubtedly contribute to stressful environments, adversely affecting the well-being of educational professionals. Such stressors can lead to alterations in both physical and mental behavior, resulting in negative psychosomatic manifestations.

Consequently, this may foster a disinterest in teaching, hinder social interactions with the surrounding community, including colleagues, students, and professional staff members, and can be attributed to the excessive efforts of educators striving for social recognition. Additionally, the imperative to integrate new information and communication technologies, embrace the intercultural dynamics of a globalized educational community, and navigate frequent curricular reforms may precipitate work-related accidents or chronic health issues within the profession (Olaya Arevalo, 2015) (Bilozerska et al., 2022).

While the work context of teachers in Latin America may appear similar across the countries examined in this study, significant differences in the prevalence of Burnout syndrome have been identified. This suggests that varying working conditions or coping mechanisms exist for teachers in each nation.

As part of the future work of this research, the analysis of the specific factors influencing the varying levels of burnout outlined in this study is considered. This analysis will encompass the variables related to both general and specific working conditions across all six countries examined, as well as the inclusion of sociodemographic variables pertinent to each sample. Additionally, it will consider factors such as weekly working hours, commute time, tenure, and salary levels.

Conclusions

It is concluded that despite the work context of teachers in Latin America may appear uniform, a notable disparity exists in the prevalence of Burnout syndrome, this variation may indicate differing working conditions or coping mechanisms employed by teachers in each nation. Mexico and Colombia exhibit burnout levels exceeding the general average, while Ecuador and Peru demonstrate averages below the general average. Educators in Ecuador display a markedly lower level of burnout on the emotional exhaustion scale and a higher level on the personal accomplishment scale. In contrast, Chile and Colombia reveal lower levels on the personal accomplishment scale compared to the other two scales.

The innovation inherent in this study resides in the application of methodologies to analyze the factors contributing to the most prevalent Burnout Syndrome among higher education instructors across six Latin American countries. The aim is to identify significant differences in Burnout levels across three scales of representation, the six countries, and between male and female genders, as well as the interaction of these three factors.

The study's findings suggest a critical need for a more in-depth examination of burnout syndrome among university educators in Latin American, as noted by (Caldichoury-Obando et al., 2024). It is vital to consider the unique characteristics of the work environment in Latin America. In this region, the prevalence of decent, quality employment and favorable working conditions that enhance the quality of life for education professionals has been lacking. Furthermore, it is imperative to acknowledge the transformations occurring in the work environment across social, cultural, economic, technological, and political dimensions, as these changes have often resulted in the decline of traditional employment forms, while alternative modalities such as remote service provision, informal work, and employment flexibility have surged. Consequently, there is an urgent need for more targeted research on the prevention and intervention of burnout, negative stress, and early intervention strategies for burnout syndrome among education workers. This is particularly important given the significance of instructional work in the teaching-learning process at the university level and the risks educators face when operating under exhaustion, which can lead to inadequate performance and pose a socially significant issue for each country.

This initial study focused on analyzing the interaction of burnout subscales across six countries and gender. Future research aims to incorporate additional variables, including the inclusion of all Latin American countries and various demographic factors that may yield more precise data.

The analysis of the results from the study indicates that no significant differences were observed in the level of Burnout across the three classification scales, to be precise, similar Burnout values were observed on the following scales: 1. Emotional exhaustion, 2. Depersonalization, 3. Personal achievement.

Furthermore, this study indicates that in Mexico and Colombia, average levels of burnout exceed significantly the general average, while in Ecuador and Peru, the averages fall below the general average. The teachers surveyed in Ecuador demonstrate a relatively lower level of burnout on the emotional exhaustion scale and a higher level on the personal accomplishment scale. Additionally, in Chile and Colombia, significantly lower levels are noted on the personal accomplishment scale in comparison to the other two scales.

Conversely, the results reveal a markedly significant difference in the comparison of the six countries examined. The average graphs demonstrate that Colombia and Mexico exhibit the highest Burnout levels, with scores of 45 and 47, respectively. In contrast, Ecuador and Peru show the lowest levels of Burnout, with average scores of 39 and 41, respectively. It is crucial to note that, despite all countries included in the sample display having elevated levels of Burnout, it exists a significant variation in prevalence among them.

In terms of sex, it is evident that there is no substantial difference in the level of burnout; men and women exhibit comparable scores, with men scoring 42 and women scoring 44.

The study also revealed no significant interactions between the factor associated with the Burnout scales and sex, suggesting that both women and men exhibit comparable average scores across the three subscales:

1. Emotional exhaustion, 2. Depersonalization, 3. Personal accomplishment.

Similarly, no substantial interaction was identified between nationalities and sex, indicating that men and women from the six countries exhibit homogeneous burnout scores.

The interaction among the three factors is not significant, suggesting that no specific combination of sex, nationality, and burnout scale level yields notably higher or lower scores.

Conversely, the subscale-nationality interaction is significant, indicating that certain combinations of nationalities exhibit markedly higher or lower scores on specific burnout representation scales. The interaction graph distinctly illustrates that the Personal Accomplishment scale is lower in Chile and higher in Ecuador.

It can be asserted that Burnout Syndrome is primarily the result of a confluence of individual, social, and organizational factors prevalent among many Latin American educators. The principal causes contributing to the manifestation of this syndrome include elements such as work overload; excessive demands for compliance that surpass teachers' capacity for adequate performance; a lack of control or feelings of inadequacy stemming from insufficient autonomy and decision-making power in their professional roles; minimal or inadequate rewards; and a lack of recognition and appropriate compensation for performance, effort, and accomplishments. Additionally, it is essential to consider the ethical value conflicts arising from the pursuit of personal objectives by each educator versus those of the educational institution, as well as poor labor relations with colleagues and authorities, and even conflicts within their workplaces.

The study's findings have underscored several risk factors and mental health consequences associated with burnout among university professors. In this regard, research gaps have been identified, particularly concerning the necessity for detection tools and their effects on mental health. Future research implications encompass the development of preventive strategies aimed at enhancing self-efficacy and addressing issues in a solution-focused manner.

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The role of psychological adaptation in the process of students' self-realization

Роль психологічної адаптації у процесі самореалізації студентів

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Abstract

The article reveals the content clarifies the essence of the concept of adaptation, and identifies the directions of adaptation, levels, types, and types of psychological adaptation. The article aims to show the important role of psychological adaptation in the process of self-realization of students of higher educational institutions. The methodological principles of the study are: leading provisions of the theory of scientific knowledge; general scientific principles of historicism, systematics, and scientificity; conceptual provisions of pedagogical, psychological, and sociological sciences; ideas of experience based on the synchronous study of pedagogical, socio-cultural and economic phenomena; philosophical and pedagogical ideas of the development of modern education. An experimental study conducted among first-year students to determine anxiety and levels of their adaptation at the ascertaining stage

Анотація

У статті розкрито зміст та з'ясовано сутність поняття адаптації, виокремлено напрями адаптації, рівні, типи та види психологічної адаптації. Метою статті є показати важливу роль психологічної адаптації в процесі самореалізації студентів вищих навчальних закладів. Методологічними засадами дослідження є: провідні положення теорії наукового пізнання; загальнонаукові принципи історизму, системності, науковості; концептуальні положення педагогічних, психологічних, соціологічних наук; ідеї досвіду на основі синхронного вивчення педагогічних, соціально-культурних і економічних явищ; філософсько-педагогічні ідеї розвитку сучасної освіти. Проведене експериментальне дослідження серед студентів першого курсу з метою визначення тривожності та рівнів їхньої адаптації на констатувальному етапі показало

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showed the need to implement a developmental program for reducing anxiety during the adaptation period, developed for first-year students of higher educational institutions. As a result of the experiment, the study of the control stage makes it possible to say that thanks to the introduction of developmental activities in the EG, which took place in the form of training sessions, which are provided for by the developmental program to reduce anxiety, the general emotional state of EG students can be considered satisfactory, and the students' anxiety has decreased.

Keywords: psychological adaptation, self-realization of students, self-development of personality, affirmation in the profession, adaptive orientation.

Introduction

Currently, the problem of adaptation is one of the key problems of psychology. The increasing interest in the problem of social and psychological adaptation and the increasingly active study of this topic in the mainstream of social psychology is due to the intensive changes taking place in modern society. Instability and, often, unpredictability of social processes impose increased demands on the individual, who must, on the one hand, meet social requirements, and, on the other, maintain internal stability and balance.

In modern conditions, a person is forced to update his vision of the world, views, and ideas about reality at increasingly shorter intervals. At the same time, the tendency to recognize the value of human individuality and, accordingly, the possibility of self-realization of a person in conditions of productive interaction with the social environment is becoming increasingly clear (Muzaliov & Shydelko, 2012).

For effective behavior in modern society, a person must meet the following requirements: 1) understand the nature of society and the organizations that form it; 2) understand his role and the role of other people in these organizations; 3) be able to analyze the results of his activities and the activities of the organizations to which he belongs. Being one of the important components of the process of forming the personality of a future specialist, higher education implies not only the acquisition of knowledge but also the development of a harmoniously developed personality. In the process of education, a person's life position is formed, and self-realization, self-respect, and self-affirmation are carried out. In the context of the problem under consideration, the university plays a dual role. On the one hand, higher education is a special socio-psychological environment, where an applicant is forced to part with his usual realities and get used to new conditions. At the same time, the success of a student's adaptation depends on two main factors - the characteristics of the individual and the characteristics of the educational environment. In addition to providing a new social space for an applicant, the university forms in its students the ability to adapt to new conditions, preparing its future graduates for effective work in the relevant professional field. The task of the university is to make its students feel their own strength and ability to achieve their goals (Doroshenko, 2017).

Despite the significant attention recently paid to the issues of human adaptation to social conditions, many aspects of the problem remain insufficiently developed. Thus, there is still no systematic development of the concept of socio-psychological adaptation of students at a university that would take into account the complexity and inconsistency of this phenomenon, there is uncertainty regarding the methods of studying this phenomenon in the context of the functioning of student self-government (SSG), the most pressing problem of adaptive resources of the individual still does not find an adequate methodological solution.

The question of the role played by a student group as a socio-psychological environment in the process of student adaptation at a university remains open. The success of the impact of student self-government on the process of student adaptation at a university has been little studied from the point of view of psychology.

необхідність впровадження розробленої для студентів першого курсу закладів вищої освіти розвивальної програми зниження тривожності у період адаптації. В результаті експерименту дослідження контрольного етапу дає можливість говорити, що завдяки упровадженню в ЕГ розвивальним заходам, що відбувалися у формі тренінгових занять, які передбачено розвивальною програмою зі зниження тривожності, загальний емоційний стан студентів ЕГ можна вважати задовільним, тривожність студентів знизилась.

Ключові слова: психологічна адаптація, самореалізація студентів, саморозвиток особистості, ствердження в професії, адаптаційна зорієнтованість.

The multifaceted, complex nature of the problem of socio-psychological adaptation of students at a university and a significant amount of unsystematized material related to this problem confront researchers with the need to consider some methodological principles and approaches to its study to create a holistic unified concept.

It is worth noting that 33.3% of students have a high rate of aggressiveness, which indicates obvious problems in the process of their adaptation. At the same time, a high rate of 36.2% was found in the state of rigidity, which indicates difficulty in changing the subject's planned program of activity in conditions that objectively require its restructuring, which undoubtedly indicates the fact of a problem in the process of adaptation. Confirming this, we note that a smaller number of students have low-level indicators. Since a high level of all these states indicates problems in the process of socio-psychological adaptation, we can say that a low level will indicate an adequate course of the process of adaptation of first-year students to the conditions of study in higher education. As noted above, while going through the adaptation process, a student experiences certain difficulties and associated unpleasant mental states, such as: anxiety, frustration, aggressiveness, and rigidity. This does not always indicate maladaptation and is a signal of the need to work with such students (Pinska, 2022).

In this regard, the problem of psychological adaptation of students becomes relevant, because it is on the level of adaptability that the ability of a young person to move to a higher level of individual development, increase their self-esteem, confidence, and awareness of their life position depends. In this regard, the topic of the article was chosen.

The development of psychological adaptation in the process of self-realization of students in the quality training of future specialists is currently a relevant issue of the theory and methodology of teaching in the educational process. Based on this, we considered the following questions in the article:

- The content and essence of the concept of adaptation, areas of adaptation, levels, types, and types of psychological adaptation.
- The connection of the function of self-realization with the ability and desire of the personality of a modern specialist for self-development and full affirmation in the profession.
- Psychological aspects and psychological components of personality self-realization.
- Types of students' educational activities that should be covered by adaptation orientation.
- Activation of independent work as a condition for implementing adaptation to expand the scope of non-regulation of students' educational actions.
- Stages of success of psychological adaptation processes of students.

Literature Review

The systematization of psychological aspects of self-realization of the individual, its theoretical analysis, disclosure of the essence of self-realization of the individual, interdependence, and interrelationship of the analysis of the problem of psychological aspects of human self-realization are the subjects of research by modern scientists. Thus, O. Pinska (2022) focused on the characteristics of personal key aspects of human adaptation, considered the essence of self-realization of the individual and showed variable approaches to defining this concept as a psychological phenomenon, outlined the basic aspects of self-realization of the individual and substantiated the system of psychological relationships; made a meaningful description of the value aspect of self-realization of the individual and the target; described the internal psychological determinants of self-realization.

The essence and content of the concept of "adaptation", the features of the professional and psychological adaptation of a future teacher of music art are revealed by T. Doroshenko (2017), and the definition of the term "professional adaptation of a future teacher of music art" in the author's interpretation is presented; the main principles of adaptation are presented, which are effective in forming the readiness for professional self-realization of a future teacher of music art; the author's conditions for implementing the principle of adaptation are developed. It is proved that adaptation is an important factor in forming the readiness for professional self-realization of a future teacher of music art. Adaptation is presented as the final stage of self-realization and professional self-determination of the individual, which makes professional activity innovative and possible.

The research on the processes and factors of the formation of a young person's personality, the processes of his identification, and adaptation was carried out in the works of O. Muzaliov & A. Shydelko (2012). It is proved that the self-realization of the individual is possible provided that the individual determines the diagnosis of the conscious goal of the "I-ideal", realistic and supported by ideas about his own "I-real", awareness of the ways to achieve it and accepting it for implementation.

At the same time, theoretical issues of the influence of student adaptation on the process of professional development of his personality remain poorly studied. The practical focus of the work, related to the study of the dynamics of the development of professionally significant personality traits of a student in the process of adaptation, is also relevant. The theoretical basis of the study was the conceptual foundations of the theory of social and psychological adaptation of a person. V. Zlyvko, S. Lukomska & O. Fedan (2016) devoted their research to the analysis of modern psychological foreign studies of crises, the possibility of implementing productive self-realization through mechanisms of goal-setting compliance with the potential real capabilities of the individual, the adequacy of the means and methods of goal realization used. Different directions of possibilities for post-stress recovery, coping strategies, and research on crises were determined. The expediency of the development of self-realization of the individual was substantiated; attention was paid to the typology of human stress disorders through its mediation by certain psychological aspects.

At the beginning of the 21st century, scientific interest in the temporal aspects of personal identity has increased significantly. In recent years, socio-psychological research has studied retrospective, current, and prospective identity. The foundations of social adaptation are revealed; trends in the study of childhood in the modern global society are analyzed; the structure and essence of the concept of adaptation are considered; the peculiarities of the process of adaptation of a gifted individual are investigated at different age periods of study; to ensure the maximum realization of the individual's potential, a model of organizing socio-psychological adaptation in the conditions of the information and educational environment of educational institutions is developed (Androsovykh et al., 2021).

In turn, scientists from foreign countries consider the problem of psychological adaptation in the process of students' self-realization and draw attention to its importance. The works of scientists from foreign countries are of great importance in the formation of psychological adaptation. The analysis of foreign scientific works provides grounds for better orientation in scientific approaches to the essence of psychological adaptation and its place in the modern educational space. We would like to emphasize that the authors Wu, X. I., Occhipinti, S., & Watson, B. (2023) draw attention to psychological adaptation using a linguistic and socio-psychological approach using the theory of communication adaptation and the desire to communicate in a second language. Scientists Kelleci, M., Tel, H., Gündoğdu, N. A., & Mert, Z. T. (2021) in their work consider the assessment of bullying by peers, Internet addiction, and the possibilities of psychological adaptation of students. Schotte, K., Rjosk, C., Edele, A., Hachfeld, A., & Stanat, P. (2022) based on two large-scale studies in Germany, investigated how different types of teachers' cultural beliefs are related to the adaptation of immigrant students to school.

Despite all the research on the role of psychological adaptation in the process of students' self-realization. These problems are caused by the following contradictions:

1. Between the passive nature of adaptation to a new social situation, the desire to avoid conflicts, and the desire of the developing student's personality for self-realization.
2. Between the established "school" forms of educational activities, leisure activities, and new requirements imposed by the higher education system, focused on independence, initiative, and responsibility.
3. Between the desire to be an adult and the inability to independently solve problems, to be responsible for actions.
4. Between inadequate ideas about future professional activities, student life, and real reality.

However, no single line has been developed regarding the essence of the concept of "adaptation". Some scientists see it as the adaptation of the individual to the environment, other scientists describe it as the interaction of people or a person with the environment, as the process of forming the main indicators of his personal and social properties by the conditions of the educational environment of a higher education institution. That is why this topic is still timely, it is relevant and requires further study, especially through the prism of higher education institutions with specific learning conditions.

Purpose of the research: to show the important role of psychological adaptation in the process of self-realization of students of higher education institutions.

Methodology

The methodological principles of the study are: leading provisions of the theory of scientific knowledge; general scientific principles of historicism, systematics, and scientificity; conceptual provisions of pedagogical, psychological, and sociological sciences; ideas of experience based on the synchronous study of pedagogical, socio-cultural and economic phenomena; philosophical and pedagogical ideas of the development of modern education.

Research methods:

- *Theoretical:* systematization, literature analysis, generalization, classification, and comparison of experimental and theoretical research data;
- *Empirical:* survey, testing.

Qualitative research methods are characterized by the fact that experimental data are collected from a relatively small group of respondents and are not analyzed using statistics, so we used quantitative methods in the study to study a large group of people and subsequently analyzed the data obtained using statistical methods.

When determining the sample of subjects, the general specificity of the subject of the study was taken into account. The total sample size is 42 subjects (67.5% (28 respondents) female; 32.5% (14 respondents) male). When forming the sample, the criteria of content, representativeness, and equivalence were taken into account. The sample was formed by random selection using the technical procedure for calculating the selection step.

The reliability and validity of the results obtained, and the objectivity of their assessment were ensured by the methodological soundness of the initial positions and the qualimetric mechanism for assessing the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

The study largely depends on the accuracy and reliability of the data. In research work, the quality of data collection and analysis not only adds weight to the research but also contributes to the formation of well-founded conclusions, which is key to academic success. To assess the homogeneity of experimental and control data collection, statistical processing was carried out using MS Excel and SPSS (Statistical Package for Social Science).

The experiment was conducted at Rivne State University for the Humanities, Poltava V. G. Korolenko National Pedagogical University, Bohdan Khmelnytsky National University of Cherkasy, Sumy State Pedagogical University named after A.S. Makarenko. The conduct of the experiment is permitted by the scientific councils of the universities in order not to violate ethical considerations in institutions of higher education.

Rigor also requires researchers to adhere to ethical principles in conducting research, including ensuring the confidentiality of research participants' data and ensuring their safety during experiments. In addition, rigor involves the use of responsible methods and standards in conducting research, as well as compliance with the rules of scientific ethics in the process of publishing research results.

The results of the experimental study confirmed the applicability, optimality, and effectiveness of the proposed pedagogical conditions of psychological adaptation in the process of students' self-realization.

An experimental study was conducted among first-year students to determine anxiety and their levels of adaptation. The age of male and female students was 17-18 full years. Forty-two respondents made up the sample.

In September, students were tested (the ascertaining stage of the experiment) to measure the level of adaptation when first-year students were in a state of adaptation.

Quantitative indicators of the data obtained at the ascertaining stage of the study indicate that more than half of the students have a high and medium level of situational anxiety, characterized by nervousness, worry, anxiety, and tension – subjectively experienced emotions. The high level of personal anxiety found in students gives reason to assume that they may have a state of anxiety not only in adapting to learning but also in various situations. This may concern the assessment of his prestige and competence, etc.

As a result of conversations with first-year students, it was found that almost half of the first-year respondents feel frustration at a high level of the need to achieve success, at a high level, a third of the first-year respondents feel frustration, and at a normal level – a little less than a third feel frustration.

About a third of students at a high level have a fear of self-expression, at a high level of such students – a little more than a tenth, and at a low level, half of the students feel fear of self-expression.

A tenth of the first-year students feel fear of a knowledge test situation at a normal level, more than half of the first-year students feel fear of a knowledge test situation at an elevated level, and a third of the first-year students feel fear of a knowledge test situation at a high level.

The fear of not meeting the expectations of others is at an elevated level for slightly more than half of the respondents. It turned out that first-year students have fears in relationships with their teachers.

We conducted a study of the level of adaptation of students in a higher education institution (confirmatory stage). The results obtained give grounds to state that a fifth of the respondents have a high level of adaptation to the study group. A third of the respondents have a low level of adaptation to the study group. The results obtained give grounds to state that a little more than a tenth of the respondents have a high level of adaptation to educational activities. A low level of adaptation to educational activities is observed in slightly more than a third of the respondents.

At the formative stage of the experiment, we implemented a developmental program for reducing anxiety during the adaptation period, designed for first-year students of higher education institutions, which is designed for ten classes (45 minutes each). Classes were held 2 times a week.

As a result of the study, we see that the number of EG students with a high level of situational and personal anxiety has significantly decreased after completing the developmental program. As a result of conversations with students, we realized that EG students note that they feel more joyful and calm in the team, look at the problem soberly, feel freedom and peace of mind, and do not despair. The results of the study showed that the level of adaptation to the study activity is as follows: 19% of respondents have a high level of adaptation to the study activity; 51% of respondents have an average level of adaptation to educational activities; 30% of respondents have a low level of adaptation to educational activities.

In the CG, respondents showed no significant changes in the results for situational anxiety, and the results for personal anxiety remained unchanged.

Using the Student's t-test for dependent samples, mathematical processing was performed to verify the reliability of the experimental data.

Thus, the experimental study makes it possible to say that thanks to the introduction of developmental activities in the EG, which took place in the form of training sessions, which is provided by the developmental program for reducing anxiety, the general emotional state of EG students can be considered satisfactory, the anxiety of students has decreased.

Results and Discussion

The content and essence of the concept of adaptation, areas of adaptation, levels, types, and types of psychological adaptation.

The problem of adaptation of young specialists is one of the most important psychological, pedagogical, and social problems of modern society. An important component of personality development is adaptation, the essence of which lies in the approximation of educational guidelines of professional training to the specific practical needs of innovative modern education in directing the educational process to develop in

future specialists the skills of adaptation to the needs of practical activity, their own capabilities (Doroshenko, 2017).

Translated from late Latin, the term "**adaptation**" (*adaptatio*) means "adjustment" and is one of the main scientific and important concepts because it is a continuous chain of constant adaptations of living organisms to the dynamic natural conditions of life and various changes in their internal state. And the most essential distinguishing feature of life is the ability to adapt (Mytnyk et al., 2023).

Adaptation, depending on the changing conditions of the interaction of the organism with the environment, consists in the restructuring of the physiological processes of higher education students and is a dynamic process that creates conditions for maintaining the constancy of the internal environment in the organism in a changing external environment with a wide range of physiological changes in the organism of the higher education student (Puhach et al., 2021).

The following areas of adaptation are distinguished, considering general issues of adaptation:

1) By structural components of the adaptive environment:

- Personal adaptation to the socio-psychological climate of the collective;
- Subject-activity adaptation;
- Personal adaptation to value orientations, dominant moods; systems of roles that arise from the social status of the employee, etc.

2) by types of adaptive environment to which the higher education applicant adapts:

- Political and legal adaptation;
- Production adaptation;
- Neighborly and friendly adaptation;
- Marital adaptation;
- Educational adaptation, etc. (Shetelya et al., 2023).

In the process of adaptation of a student, the following levels are distinguished:

- **Biological level** – a constant process of biological adaptation ensures the life of a higher education student as a biological being;
- **Social level** – the human body is forced to adapt to much faster social and technological changes to survive (natural disasters, climate, etc.), and not only to natural environmental changes;
- **Psychological level** – rapid social and technological changes significantly affect the physical and mental state of a higher education student (Muzaliov & Shydelko, 2012).

Let's highlight some types of psychological adaptation.

1. Normal adaptation – is an adaptive process where the adaptation of a higher education student occurs without pathological changes in the structure of the individual in typical problem situations and without violations of the norms of the social group in which the activity of the higher education student takes place. There are two types of normal adaptation:

- **Protective adaptation** – these are the actions of the individual that occur with the help of protective mechanisms: the formation of a reverse reaction, rationalization, aggression, regression, projection, etc.;
- **Non-protective adaptation** – these are processes (adaptive, non-protective) that require the individual to make rational decisions and manifest themselves in non-frustrating problem situations. In conditions of the emergence of problematic, non-frustrating situations, to achieve adaptability, the cognitive processes of student youth are used. With the help of various forms of student socialization, communication and exchange of information, solving tasks (comfortable behavior, without involving protective mechanisms), intellectualization of the student's individual life experience, etc.

2. The defensive-non-defensive or mixed type of socio-psychological adaptation of the personality simultaneously faces constructive tasks to expect social roles and is carried out in problem situations where the student has a partially frustrated personality. The student's cognitive abilities are effectively used precisely under such circumstances, the social experience of the student, who shows defensive aggressiveness as a tendency towards self-realization, is taken as the basis, and using personal mechanisms of attribution and projection, accusations of other personalities arise.
3. Deviant adaptation is an adaptation that ensures the satisfaction of the needs of each individual in the social environment or a given group of students, but the behavior of one individual in the social process does not justify the expectations of other participants. There are the following types of deviant adaptation:
 - *Innovative* – a type of human activity or role performance (creative or innovative) behavior of a student, in the process of which a higher education applicant makes innovations in other areas of culture and creates new values. This modification of deviant adaptation is the main means of preventing regression and stagnation and is an effective factor of progress;
 - *Non-conformist* – the process of adaptation of a higher education applicant, thanks to which the student, in ways and means unusual for members of this group, overcomes an intra-group problem situation and, as a result, finds himself in conflict relations with the norms of the group and their carriers.
4. Pathological adaptation is the activity of a higher education applicant in socio-psychological situations, a socio-psychological process that is carried out in whole or in part with the help of pathological mechanisms and forms of behavior and leads to the formation of character complexes of higher education applicants, which take the student's behavior beyond the normal (Nakonechna et al., 2017).

Psychological analysis at the level of a higher education applicant corresponds to the area of the conceptual field that treats adaptation as a process and, as a result – at the level of the individual. When considering the dynamics and structure of adaptive activity the course of adaptive processes, one should bear in mind the non-adaptability, adaptability, and maladaptability of a higher education applicant as a subject of his life activity, and when there is a formalization of mental processes in the form of complexes and states (neuroticism, fear, depression), it will be correct to use the terms adaptation: "non-adaptability", "adaptability" or "personality maladaptation" (Mytnyk et al., 2024). There is a certain convention in this distinction of concepts, but in theoretical terms, since it allows for a more differentiated representation of the palette of real interaction with a person's environment, it has a significant advantage. It is clear that the levels of psychological adaptation, like the levels of psychological cognition, are intertwined, complementing each other, and are closely related to each other (Muzaliov & Shydelko, 2012).

The connection of the function of self-realization with the ability and desire of the personality of a modern specialist for self-development and full affirmation in the profession.

The function of self-realization is connected with the ability and desire of the personality of a modern specialist for self-development and full affirmation in the profession. At the same time, there is a restructuring of the student's abilities and the system of skills necessary in this activity for realizing oneself as a modern specialist. In this process, it is not special skills that become dominant, but creative ones, which are in unity with changes and contribute to the direction of the educational process itself and allow adaptation to the profession (Overchuk et al., 2023).

The issue of the controllability of these processes is essential for understanding adaptation processes. Adaptation is adjusted in the process of psychological and pedagogical management of it. Adaptation processes become significant as an important factor for the prospective development of the student and the formation of his personality as a professional. The presence of integrity of adequate ideas about the professional training of the future specialist, the conditions of his activity at the enterprise or in the educational institution, and professional requirements and tasks for acquiring professional knowledge is conditioned by the motivation for adaptation processes (Sbicigo & Dell'Aglio, 2012).

Thus, psychological and pedagogical adaptation orients the student to the formation of a professionally active attitude to professional activity and to mastering specific skills of the professional direction.

Solving the issue of psychological adaptation of future specialists concerns the problem of their professional practical training – correlation with motivational guidelines, the ability of student youth to self-control, and self-analysis, which becomes a stimulus for professional adaptation to the needs of the specialty.

When training specialists in higher education institutions, it is worth making a transition from tasks of a reproductive nature to performing tasks of a creative and creative-research nature.

With the complication of such creative, research professional tasks, the awareness of students' need for adaptation increases. Students' adaptive capabilities increase by overcoming difficulties. The need for students to achieve research peaks of training, the creative direction of their activities, and actualize students' search approaches to adaptation. The level of such adaptation depends largely on personal qualities: independence, initiative, creative orientation, and self-realization.

Psychological aspects and psychological components of personality self-realization.

Self-realization is considered a conscious process of growth and development of the essential forces of a person, his skills, needs, creative abilities, life values, motives, as a person's realization of himself in everyday activities, in life through cooperation with other people, co-creation, his own efforts, as the affirmation and search in this world of his special path, his values and the meaning of life at each given moment of his existence.

Considering self-realization from a psychological point of view, focusing on the multifaceted nature of this phenomenon, speaking of self-realization as a universal ability of an individual to self-realization, a system of concepts is distinguished in the structure of self-realization: creativity, value, goal, need, meaning, process, result, etc., which are psychological components of self-realization (Pinska, 2022).

The self-realization of each student includes the choice, awareness, realization of all aspects of individuality, realization of potentials that contribute to self-expression, formation of one's own system of self-concept, motives, values, meanings, transformation of oneself, setting goals and determining ways to achieve them (Maksymenko & Osiodlo, 2010).

To form the tasks and goals of self-realization, values serve as the basis.

Value is a concept used to denote phenomena, their properties, objects, and abstract ideas that act as a standard of what is proper and, therefore, embody social ideals.

Let us describe three forms of the existence of value:

- Value, which appears in an objective form in the form of human actions, products of spiritual and material culture-specific, social value ideals of legal, political, aesthetic, objective embodiments, etc.);
- Value as a social ideal, as an abstract idea developed by social consciousness about the attributes of the individual proper level (perfection, uniqueness, justice, goodness, truth, beauty, life-creativity, integrity) and the specific historical level (democracy, equality);
- Social values are one of the sources of motivation and behavior of a student, which are included in the individual structure of the personality, refracted through the prism of individual life activities as personal values (Shapar, 2007).

So, self-realization, the main characteristics of which are the awareness of the individual of his/her Self, is a complex psychological phenomenon with the characteristics of a unique, inimitable world, which is the highest need of a person, the satisfaction of which can ensure his/her full development.

The highest final result of the self-development of the individual is the realization and choice of values and goals as key psychological aspects of self-realization, the implementation of which is precisely what student youth want to devote their professional lives to (Pinska, 2022).

Types of students' educational activities that should be covered by adaptation orientation.

Let us distinguish the types of students' educational activities that should be covered by adaptation orientation:

- Cognitive, educational activities of students;
- Evaluative educational activities of students;
- Creative and active educational activities of students.

The cognitive component of students' educational activities concerns the development of their ability to use existing knowledge of professional orientation in the process of acquiring knowledge.

By solving creative tasks, students come to understand the crucial importance of practical mastery of adaptation, awareness of its need, and not only the methods of psychological adaptation. The student, adapting to the real circumstances of the professional orientation of the educational field, relies on the actualization of his own creative capabilities, on independence in seeing the problem, and on the proactive solution to the situation. Thus, in solving the problem of self-realization of the individual, the formation of a creative specialist is associated with the implementation of adaptive processes in an innovative society when forming the readiness of future specialists for professional self-realization (Sluta et al., 2023).

Orientation to the prospect of the future profession – content, forms, methods, teaching in higher education, as a condition for implementing the principle of adaptation, involves the development of innovative tasks, the development of methods for implementing the student's professional orientation, the disclosure of his professional potential, the correction of the content of educational courses, which create the basis for the disclosure of the psychological and pedagogical potential of the student's personality and the development of forms of work necessary for professional growth throughout life (Demchenko et al., 2022).

Activation of independent work as a condition for implementing adaptation to expand the scope of non-regulation of students' educational actions.

For the implementation of adaptation to expand the scope of unregulated educational actions of students, it is necessary to maximize the activation of independent work in higher education, providing students with the means of individual strategy, freedom of choice, and delegation of responsibility for independently made decisions.

Based on providing pedagogical support, achieving interaction with teachers, and mutual respect between teachers and students, the scope of unregulated educational actions of students should be expanded (Vlasenko et al., 2023).

Psychological comfort between teachers and students allows a student to perceive himself as a capable person to find optimal ways to improve his professional orientation in the future, his own learning throughout life, and as a successful creative personality (Perera et al., 2020).

To eliminate the shortcomings of creative and search work, it is possible to conduct a benevolent criticism of the analytical order. Based on the expansion of the unregulated nature of students' activities, remarks that level the independence of students' approaches to educational or professional activity have no right to exist in the system of actualization of students' initiative (Zaveryko et al., 2022).

So, this approach shows that psychological adaptation, which is closely related to pedagogical adaptation in the educational process of higher education, makes professional activity possible and is the final stage of professional self-realization of the individual. Psychological adaptation, which is closely related to pedagogical adaptation, increases the level of professional adaptation of a specialist and leads to an increase in his professional skills as a person. Therefore, adaptation is important in forming the readiness of a future specialist for professional self-realization (Doroshenko, 2017).

Stages of success of psychological adaptation processes of students.

The success of the adaptation processes of students depends on the following:

- On the age characteristics of the student: the need for self-realization, self-affirmation, cognitive needs, emotional excitability, and a sense of adulthood;
- On the teachers' consideration of the individual characteristics of students, the psychological characteristics of a person, the degree of social activity of students and the nature of the orientation of

their organizational, communicative, behavioral, and mental activity; the ability to adapt to the conditions of a new team, etc. (Riul et al., 2023).

The process of successful adaptation of students is complex and occurs in three stages:

- The stage of mutual perception of the individual by the team and initial acquaintance, accepting all the psychological characteristics of each person;
- Readaptation from the previous team, where the individual was;
- The final adaptation of the student to the new team.

Acceleration and facilitation of the adaptation process of students occur provided that optimal interaction of the “teacher-student”, and “student–student” systems is achieved.

Let us consider the difficulties of adaptation of each student, which may be due to:

- Psychological content, which includes preadaptation as an adaptation to imaginary situations, to the future, the formation of a psychological attitude towards maladaptation, adaptation; disadaptation as weaning from some “new”, those that have already become, to some extent, habitual conditions to other “habitual” conditions; as weaning from the activity and habitual living conditions; as maladaptation (inability to adapt to the social environment, non-adaptation to new conditions of the educational environment);
- The nature of the interaction of the adaptive environment, where adaptation can be in the form of adaptation, the subject of adaptation;
- Structural components of the educational environment, distinguishing personal, subject-activity adaptation to the socio-psychological climate of the collective;
- Types of adaptive environment that each student adapts to himself or to which he adapts, highlighting political, legal, educational, industrial, friendly, and neighborly adaptation.

With this classification, all types of adaptive processes are different. They differ in duration, intensity, and result of influence; they difactualize and activate each student's socio-psychological experience in different ways. Difficulties depend on the system of values, the student's self-image, the ability to cognitively evaluate, the personal significance of negative events, flexible rethinking of difficult situations, and the level of the student's spiritual and moral development.

Thus, the main reasons for the disorganization of the student's adaptive behavior are the experience of threats and the lack of effective ways to overcome student difficulties. Therefore, there is a need to create optimal educational conditions for the inclusion of the student (as an active subject) in the process of socialization and activation of the student's potential personal and psychological capabilities, his internal reserves (Androsovykh et al., 2021).

Experimental research.

We conducted an experimental study among first-year students to determine anxiety and their levels of adaptation. The age of male and female students was 17-18 years. 42 respondents made up the sample:

- 67.5% (28 respondents) female;
- 32.5% (14 respondents) male.

In September, students were tested (the ascertaining stage of the experiment) to measure the level of adaptation when first-year students were in a state of adaptation.

The results of the test indicated the main difficulties for young specialists in socio-psychological adaptation. Despite the practically formed behavior regulation in modern youth, first-year students are characterized by high personal anxiety; this is shown by the results of the ascertaining experiment conducted according to the method of Ch. Spielberger in the modification of Yu. Khanin.

It was found that:

- 40% of respondents have a high level of situational anxiety;
- 35% of respondents have an average level of situational anxiety
- 25% of respondents have a low level of situational anxiety (Fig. 1).

Percentage of Respondents

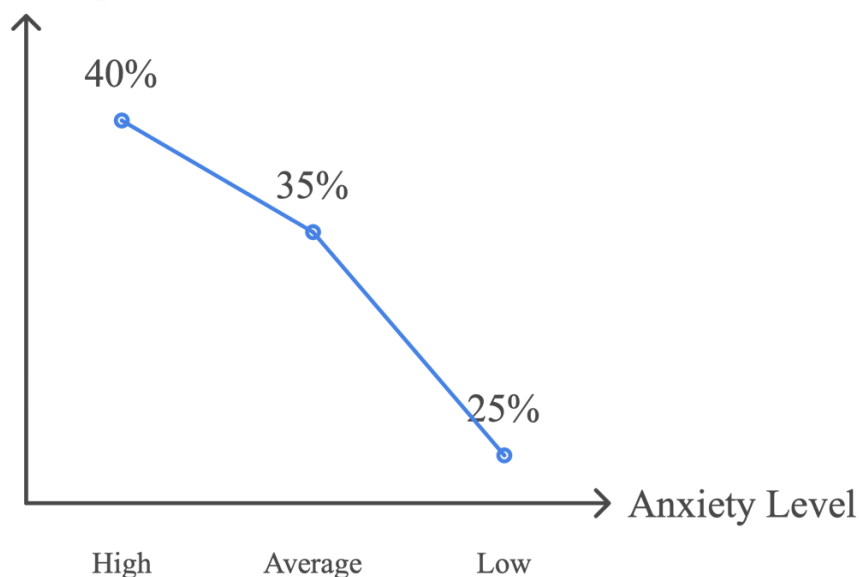


Figure 1. Levels of Situational Anxiety Among Respondents.

Regarding personal anxiety, we obtained the following results of the ascertainment experiment (Fig. 2):

- 27% of respondents have a high level of personal anxiety;
- 39% of respondents have an average level of personal anxiety;
- 34% of respondents have a low level of personal anxiety.

Percentage of Respondents

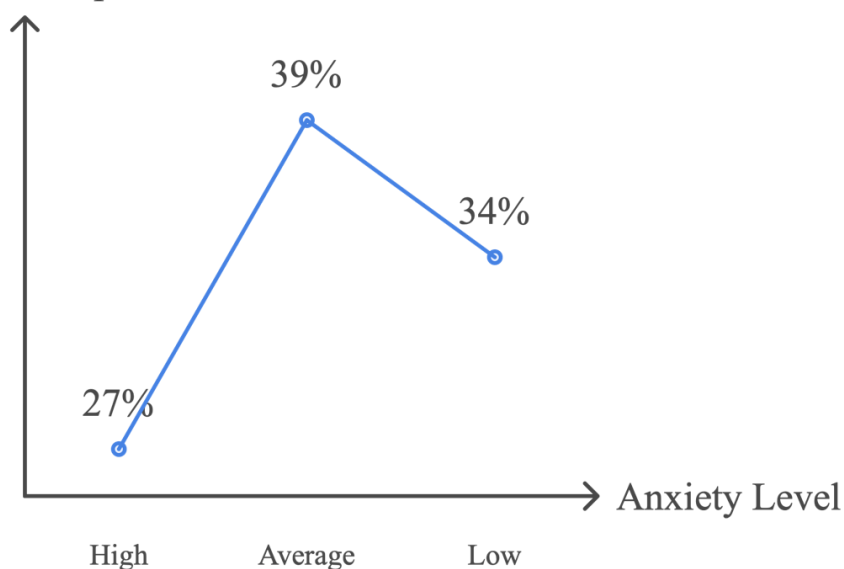


Figure 2. Levels of Personal Anxiety Among Respondents.

The quantitative indicators of the data obtained at the ascertainment stage of the study indicate that more than half of the students have a high and average level of situational anxiety, which is characterized by nervousness, worry, anxiety, and tension – subjectively experienced emotions. As an emotional reaction to a stressful situation, this state occurs in students and can vary in dynamics in time and intensity.

A third of respondents have a high level of personal anxiety. This indicates a tendency for first-year students to perceive a threat to their life activities, self-realization, and self-esteem in a wide range of situations and to react with a state of anxiety (very pronounced).

The high indicator of personal anxiety found in students gives reason to assume that a state of anxiety may be not only in adaptation to learning but also in various situations. This may concern the assessment of one's prestige and competence, etc.

A low level of anxiety requires an increased sense of responsibility and increased attention to the motives of activity.

As a result of conversations with first-year students, it was revealed that almost half of the first-year respondents feel frustration at a high level of the need to achieve success, at a high level, a third of the first-year respondents feel frustration, and at a normal level – a little less than a third feel frustration.

About a third of students at a high level have a fear of self-expression, at a high level of such students – a little more than a tenth, and at a low level, half of the students feel fear of self-expression.

A tenth of the first-year students feel fear of a knowledge test situation at a normal level, more than half of the first-year students feel fear of a knowledge test situation at an elevated level, and a third of the first-year students feel fear of a knowledge test situation at a high level.

A little more than half of the respondents at an elevated level have a fear of not meeting the expectations of others. To a large extent, students are inclined (in assessing results) to focus on the opinions of others, on actions and thoughts. Anxiety about the assessments of others arises in significant situations when the student is unsure of the correctness of his actions or the situation is not entirely clear to him. A freshman hesitates about the correctness of the answer, is unsure of himself, is sensitive to the assessment of others, and constantly expects their unsatisfactory assessment of him.

More than a third of respondents at a normal level have this indicator. When assessing their own actions, results, and opinions, their orientation to the opinions of others is adequate; their behavior is well controlled. The student is ambitious and active, tries to communicate on an equal footing with everyone, and takes an active position of confrontation in case of disagreement with the opinion of another. Since the student is emotionally stable and highly tolerant of stress, we assume the success of the adaptation of such a student. A third of respondents have this indicator at a high level. In their emotional reactions and behavior, the student depends on the opinions of others and is inclined to be guided by the opinions of others in assessing the results of their actions, their activities, and their thoughts. Feels anxious about any assessments of others, constantly expecting (even in a favorable situation for themselves) negative reactions from others. The emotional state is characterized by constant worry, uncertainty in the world around them, and loss of orientation in life. Such a first-year student is characterized by low self-esteem and a tendency to form ideas of insufficient value in their own personality.

It turned out that first-year students have fears in relationships with their teachers. Most first-year students have problems at a low level. Here, we observe such students' success in learning; students are in a position of friendly, mutual understanding with the teacher, which causes positive emotions in students, we observe the students' self-confidence, cooperation in joint activities, and desire to learn something new.

At an elevated level, they do not have problems and fears in their relationships with the teacher – less than a third of such respondents. With the teacher, the general emotional background of the relationship is determined by instability. The student is anxious, tense in communication with individual teachers, and shows insecurity and increased anxiety, which can generally negatively affect the success of learning.

In relationships with the teacher, no respondents with a high level of problems and fears were identified.

We conducted a study of the level of adaptation of students in a higher education institution (confirmatory stage).

The results of the study showed that the level of adaptation to the study group is as follows (Fig. 3):

- 21% of respondents have a high level of adaptation to the study group;
- 49% of respondents have an average level of adaptation to the study group;
- 30% of respondents have a low level of adaptation to the study group.

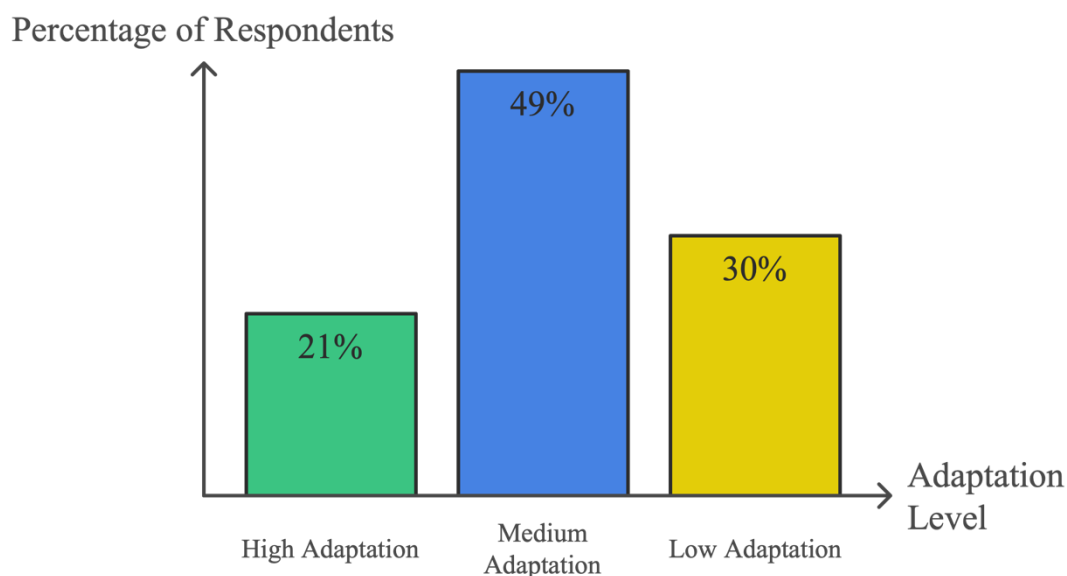


Figure 3. Levels of Adaptation to Study Group.

Therefore, the results obtained give grounds to assert that a fifth of the respondents have a high level of adaptation to the study group – the student easily finds a common language with everyone, feels comfortable in the group, is guided by the rules adopted in the group, can take the initiative in the group, and show activity. Also, fellow students support and accept his interests and views.

A third of the respondents have a low level of adaptation to the study group – the student shows restraint in relationships, keeps to the side, experiences difficulties in communicating with fellow students, does not accept the rules adopted in the group, does not meet with fellow students acceptance of their views, understanding.

The results of the study showed that the level of adaptation to the study activity is as follows (Fig. 4):

- 19% of respondents have a high level of adaptation to the study activity;
- 51% of respondents have an average level of adaptation to educational activities;
- 30% of respondents have a low level of adaptation to educational activities.

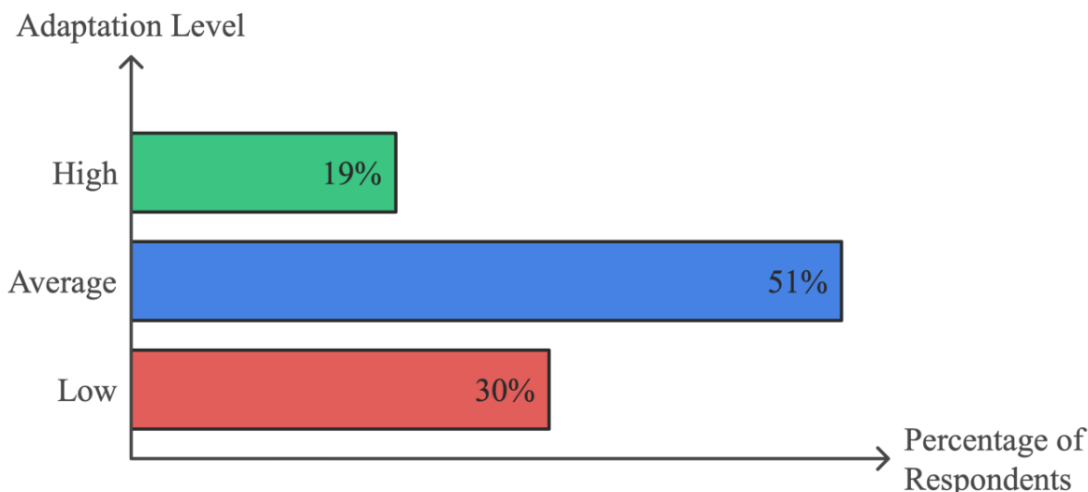


Figure 4. Levels of Adaptation to Study Activity.

Therefore, the results obtained give grounds to assert that a high level of adaptation to educational activities is possessed by slightly more than a tenth of respondents, which indicates that the student completes educational tasks on time and successfully, masters educational subjects easily can show his individuality, freely expresses his thoughts, and shows abilities in classes.

A low level of adaptation to educational activities is observed in slightly more than a third of respondents, which indicates that the student poorly performs educational tasks and masters educational subjects; it is difficult for him to express his thoughts, speak in classes, cannot show his individuality, cannot ask questions to the teacher, needs additional consultations, and does not show abilities in classes.

At the formative stage of the experiment, we implemented a developmental program for reducing anxiety during the adaptation period, designed for first-year students of higher education institutions, which was designed for ten classes (each 45 minutes). Classes were held 2 times a week.

To prove the effectiveness of the developmental program we implemented to reduce anxiety, a control section of the level of anxiety and adaptation of first-year students was conducted. First-year EG students studied according to this program.

We re-conducted a study using the method of Ch. Spielberger modified by Yu. Khanin.

The following results were obtained in the EG regarding the level of personal anxiety in first-year students (Fig. 5):

- 12% of EG respondents have a high level of personal anxiety;
- 48% of EG respondents have an average level of personal anxiety;
- 40% of EG respondents have a low level of personal anxiety.

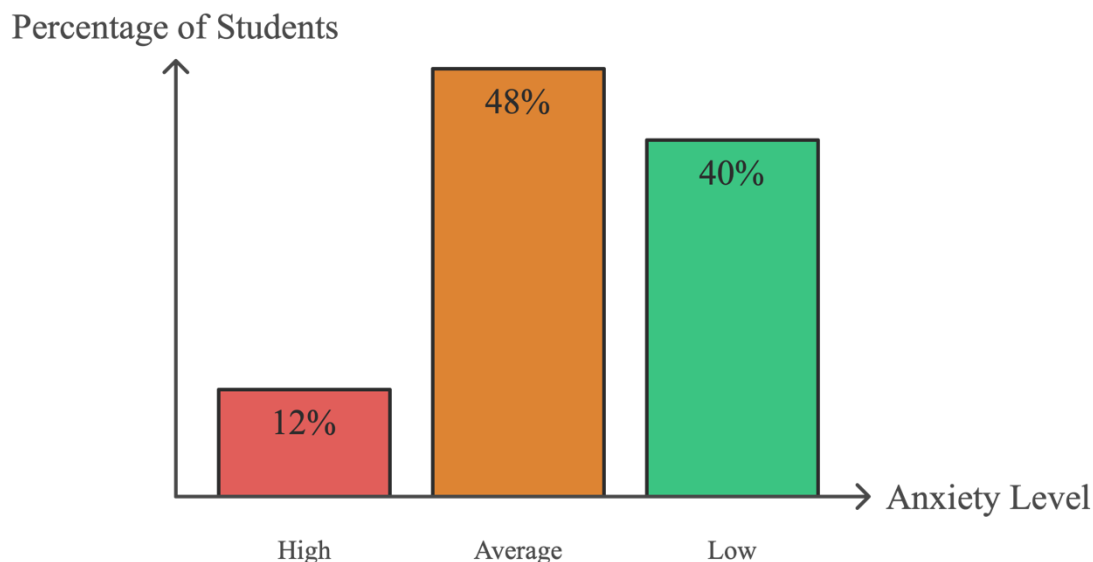


Figure 5. Levels of Personal Anxiety in First-Year Students.

The following results were obtained in the EG regarding the level of situational anxiety in first-year students (Fig. 6):

- 15% of EG respondents have a high level of situational anxiety;
- 45% of EG respondents have an average level of situational anxiety;
- 40% of EG respondents have a low level of situational anxiety.

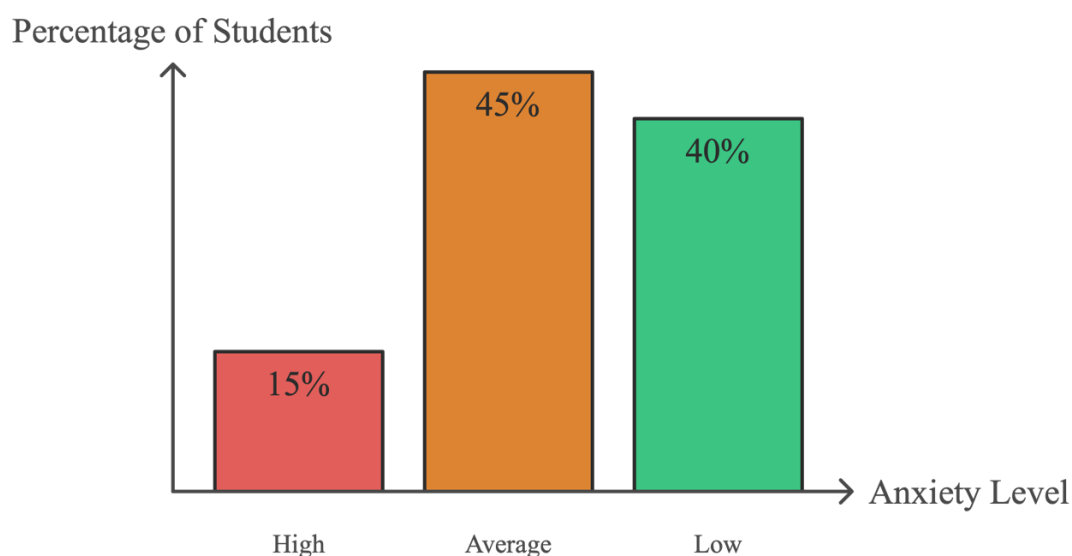


Figure 6. Levels of Situational Anxiety in First-Year Students.

So, the number of EG students after completing the development program with a high level of situational and personal anxiety has significantly decreased.

As a result of conversations with students, it was understood that EG students note that they feel more joyful and calm in the team, look at the problem soberly, feel freedom and peace of mind, and do not despair.

In the CG, respondents showed no significant changes in the results for situational anxiety, and the results for personal anxiety remained unchanged.

Using the Student t-test for dependent samples, mathematical processing was performed to verify the reliability of the experimental data.

Thus, the experimental study allows us to say that due to the introduction of developmental activities in the EG, which took place in the form of training sessions, as provided for by the developmental program for reducing anxiety, the general emotional state of EG students can be considered satisfactory, and students' anxiety decreased.

The decrease in the level of anxiety of EG students contributed to their manifestation of initiative in completing tasks, activation in the educational process, and the formation of self-confidence, and led to improved adaptability to educational activities and the study group.

According to the results of the statistical processing of experimental data of the ascertaining and control stages of the experiment, we note the significance of the positive changes detected ($p \leq 0.01$), which confirms the reliability of the change in the level of adaptation and anxiety of first-year students of a higher education institution. This allows us to speak about the effectiveness of the implementation of the developmental program we have developed.

Changes in the level of anxiety and adaptation are related precisely to the process of self-realization of students, which is a key component of the set goal. Adaptation as a necessary condition for the existence of all living things includes as a mandatory prerequisite the interaction of the individual with the educational environment. A high level of adaptation to the study group allows the student to easily find a common language with everyone, feel comfortable in the group, be guided by the rules adopted in the group, the ability to take the initiative in the group, be active, act as an active subject in the process of socialization, self-realization and activation of potential personal and psychological opportunities, his internal reserves. Changes in the level of anxiety and adaptation indicate that the student completes educational tasks on time and successfully, masters educational subjects easily can show his individuality, freely expresses his thoughts, and shows self-realization during training. A high level of adaptability leads to the student's self-realization and provides the opportunity to feel more joyful and calm in the team, soberly look at the problem, feel freedom and peace of mind, and not despair.

So, changes in the level of anxiety and adaptation are associated precisely with the process of self-realization of students, which is a key component of the set goal, which contributed to the manifestation of initiative by students in completing tasks, activation in the educational process, and the formation of self-confidence.

As a result of the theoretical work, it was established that the adaptation of students to the conditions of the university is a complex, comprehensive process, which must be considered through adaptation to future professional activity and adaptation to the conditions of a specific university. At the same time, the analysis of adaptation must be done not only statically, but also dynamically, which makes it much more valuable. Data on the features of the adaptation process and the professional development of the student's personality must be more actively used in the educational process of the university.

The practical significance of the work: the Student's T-criterion was used for independent samples, and mathematical processing was carried out to verify the reliability of the experimental data. Due to the implementation of the developmental activity in the Unified State University, which took place in the form of training sessions, as was provided by the developmental program of anxiety reduction, the general emotional state of the Unified State University students can be kept satisfied, and the anxiety of students has decreased.

The conducted research does not claim to be an exhaustive completeness of the problem development. The issues of increasing the level of professional preparedness of the graduate remain relevant: the creation of a system of disciplines that help the student to adapt to the conditions of study at the university; the development and implementation of a system for monitoring the adaptation process, allowing to track individual changes in development, as well as prompt correction of professional development.

Conclusions

The content and essence of the concept of adaptation are revealed, and the directions of adaptation, levels, types, and types of psychological adaptation are identified. The connection of the function of self-realization with the ability and aspiration of the personality of a modern specialist for self-development and full-fledged affirmation in the profession is shown. The psychological aspects and psychological components of the self-realization of the personality are described. The types of educational activities of students that should be covered by adaptation orientation are identified and described. It is proved that the activation of independent work is a condition for the implementation of adaptation to expand the scope of non-regulation of students' educational actions. The stages of the success of the processes of psychological adaptation of students are described.

An experimental study was conducted among first-year students to determine anxiety and their levels of adaptation.

Quantitative indicators of the data obtained at the ascertaining stage of the study indicate that more than half of the students have a high and medium level of situational anxiety, characterized by nervousness, preoccupation, anxiety, and tension – subjectively experienced emotions. The high indicator of personal anxiety found in students gives reason to assume that the state of anxiety may be not only in adaptation to learning but also in various situations. This may relate to the assessment of its prestige and competence, etc.

A study of the level of adaptation of students in a higher education institution was conducted (the ascertaining stage). The results obtained give reason to assert that a fifth of the respondents have a high level of adaptation to the educational group. A third of the respondents have a low level of adaptation to the educational group. The results obtained give reason to assert that a little more than a tenth of the respondents have a high level of adaptation to educational activities. A low level of adaptation to academic activities is observed in slightly more than a third of respondents.

At the formative stage of the experiment, we implemented a developmental program for reducing anxiety during the adaptation period, designed for first-year students of higher education institutions, which is designed for ten classes (45 minutes each). Classes were held 2 times a week.

To prove the effectiveness of the developmental program we implemented to reduce anxiety, a control section of the level of anxiety and adaptation of first-year students was conducted. First-year EG students studied according to this program.

Using the Student's t-test for dependent samples, mathematical processing was performed to verify the reliability of the experimental data.

Thus, the experimental study makes it possible to say that thanks to the introduction of developmental activities in the EG, which took place in the form of training sessions, which is provided by the developmental program to reduce anxiety, the general emotional state of EG students can be considered satisfactory, and student anxiety has decreased.

Prospects for further research also include studying the gender characteristics of the manifestation of students' anxiety in the process of adaptation, developing programs to optimize adaptation, and psychological recommendations designed for each level of anxiety.

At the level of further theoretical understanding of the problem, it seems appropriate to focus on clarifying the essence and content of psychological adaptation as an object of joint research by sociologists and psychologists. It should be noted the breadth of problems that are still waiting for their solution in the field of studying the psychological adaptation of students in higher education.

The most promising direction, in our opinion, may be the study and a detailed, step-by-step description of the adaptation process itself. In the course of such a study, the tasks that are solved by the individual at each stage of the adaptation process should be considered, and the dynamics of changes not only in the traditional emotional, but also in the cognitive and behavioral components should be analyzed, and typical violations of the process characteristic of individual stages should be identified. A detailed description of the

psychological adaptation process will allow the implementation of a new methodological approach to the study of the adaptive potential of a student. This approach is built on the assumption that the composition of personal qualities that can be interpreted as adaptive is clearly determined by the tasks that the individual has to solve at different stages of the adaptation process. It is the description of such tasks that will allow us to identify the adaptive qualities responsible for their successful solution and, through this, determine the structure of overall adaptability.

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Consulting activities in the modern educational space: necessity or a fad?

Консалтингова діяльність в сучасному освітньому просторі: необхідність чи мода

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Abstract

The article clarifies the importance of educational consulting and ways to ensure high-quality consulting activities in the modern educational space to form the entrepreneurial competence of specialists. The purpose of the article is to substantiate the basic principles of consulting activities in the modern educational space and the formation of entrepreneurial competence of specialists to ensure a high-quality educational process throughout life. The methodological principles of the study are: leading provisions of the theory of scientific knowledge; general scientific principles of historicism, systematicity, and scientificity; conceptual provisions of pedagogical, psychological, and sociological sciences; ideas of experience based on the synchronous study of pedagogical, socio-cultural and economic phenomena; philosophical and

Анотація

У статті з'ясовано вагомість освітнього консалтингу, шляхи забезпечення якісної консалтингової діяльності в сучасному освітньому просторі з метою формування підприємницької компетентності фахівців. Метою статті є обґрунтування основних засад консультативної діяльності в сучасному освітньому просторі та формування підприємницької компетентності спеціалістів для забезпечення якісного освітнього процесу протягом життя. Методологічними засадами дослідження є: провідні положення теорії наукового пізнання; загальнонаукові принципи історизму, системності, науковості; концептуальні положення педагогічних, психологічних, соціологічних наук; ідеї досвіду на основі синхронного вивчення педагогічних, соціально-культурних і економічних явищ;

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pedagogical ideas for the development of modern education. The components of the entrepreneurial competence of specialists are identified. The main functions of consulting and trends that determine the development of consulting services are shown. The results of the experiment demonstrated the effectiveness and feasibility of the developed methodology aimed at improving consulting activities in the modern educational space.

Keywords: consulting activities, management culture, entrepreneurial activity, entrepreneurial competence, consulting services in education.

філософсько-педагогічні ідеї розвитку сучасної освіти. Виокремлено складові підприємницької компетентності фахівців. Показано основні функції консалтингу та тенденції, що зумовлюють розвиток консалтингових послуг. Результати експерименту продемонстрували ефективність та доцільність розробленої методики, спрямованої на вдосконалення консультативної діяльності в сучасному освітньому просторі.

Ключові слова: консалтингова діяльність, управлінська культура, підприємницька діяльність, підприємницька компетентність, консалтингові послуги в освіті.

Introduction

Modern global transformations in all spheres of human life determine the active, innovative development of consulting. The sphere of consulting activities, in particular, support of participants in the educational process through communication in the modern educational space during its management, has expanded to solving problems in the management of educational institutions, vocational training, labor relations, health and religion, social security, etc.

Since the education system is experiencing a period of radical reforms and large-scale changes associated with integration into the global space, the emergence of new opportunities for the development of educational services, the modernization of state support for education, the commercialization of education, consulting services in the educational sphere are increasingly being used (Khomenko, 2020).

Global changes and transformations are taking place in the higher education system, which are associated with adaptation to the constantly changing external environment. Under the influence of economic, technological, and social transformations that exist in the global educational space, the development of higher education is carried out (Drahunova, 2023).

The active development of the modern digital society necessitates the introduction and use of consulting in the educational sphere at a professional level, which will contribute to the support and development of the educational institution, thereby ensuring the quality of education and facilitating the provision of high-quality educational services. The ability of higher education institutions to develop rapidly in the context of global changes and a progressive market is one of the most important conditions for their successful functioning.

However, despite the wide range of issues considered in the works of scientists on consulting activities, it can be argued that so far there is no coherent, scientifically based idea of the importance of educational consulting.

The development of Consulting activities in the quality training of future specialists is currently a relevant issue of the theory and methodology of teaching in the educational process. Based on this, we considered the following issues in the article:

- Different approaches to the content of the concept of "consulting", the content of educational consulting, and the leading goal of consulting.
- Ensuring high-quality consulting activities in the modern educational space to form the entrepreneurial competence of specialists.
- Consulting functions and trends that determine the development of consulting services.
- Various aspects of consulting services in the field of higher education and methodological recommendations for their inclusion in the system of activities of a higher education institution.
- External and internal principles of consulting services in the modern educational space and features of consulting services of educational activity subjects to promote the management culture of future specialists.

Literature Review

Analysis of scientific literature on the essence and content of the concept of "consulting" allows us to state that many Ukrainian and foreign authors have studied this issue.

The issue of the essence, relevance in modern conditions, tasks, and goals of consulting activities is considered by I. Spilnyk (2005), in particular, attention is focused on the analytical nature of consulting activities and their content. It is proved that the success of a consulting firm depends on the analytical training of personnel, the importance and necessity of developing organizational and methodological principles of analytical support for consulting are shown. The same problem in the constantly changing educational environment is studied by Z. Riabova (2022), emphasizing the constant activation of the processes of transformation and adaptation of educational activities of the educational space and participants in the educational process and their professional activities. It is emphasized that "educational consulting in the management of a vocational (vocational and technical) education institution is aimed at supporting participants in the educational process through communication, meetings and facilitating their decision-making regarding the effective functioning of the educational institution in conditions of uncertainty".

The work of many scholars has been devoted to the study of the genesis, and emergence of the institute of consulting activities, and the evolution and subsequent formation of the global consulting services industry.

Having considered the issues of the essence, relevance in modern conditions, tasks, and goals of consulting activities, we will single out studies that are devoted to the overview direction of the specified problem. In particular, the studies of V. Drahunova (2023) are due to the "need to understand the essence and conceptual and terminological apparatus of the study of consulting activities in a higher education institution in conditions of uncertainty against the background of socio-economic crises". The scientist revealed the essence of consulting activities in a higher education institution and carried out an analysis of consulting activities in a higher education institution (scientific and theoretical) in the conditions of the development of consulting activities and the rapid growth of consulting services.

Currently, the demand for consulting services is growing, which is due to the development of business and the need to increase the efficiency of its work. The relevance of the chosen topic is explained primarily by the fact that the formation of the economy of Ukraine as an integrated system occurs under the conditions of the development of the consulting services market. The transformation processes taking place in Ukraine objectively require the coordination of national economic policy, and market transformations in the service sector, and therefore the study of this issue is practical and relevant. Also, the essence and disclosure of the conceptual and terminological apparatus of the study of consulting activities is devoted to the study of V. Khomenko (2020). The scientist substantiated the features and necessity of providing consulting services in the field of education and analyzed the main functions of consulting in education. The main areas of cooperation between educational institutions and consulting companies are characterized by scientific and methodological support of the educational process, conducting various studies for the needs of the educational industry, and legal support for educational activities, revealing the importance of management consulting in the educational industry.

The growing demand for consulting services is causing the transformation of audit, legal, and valuation companies into commercial associations that provide a comprehensive range of services. Issues related to the formation and functioning of the consulting services market are extremely relevant, including in terms of improving institutional instruments for interaction between the state and science, aimed at increasing the professional activity of enterprises. Therefore, we drew attention to the works of foreign authors on this topic. The author Erchul, W. P. (2022) notes that the parallels between school counseling and academic coaching are significant, as both fields typically involve an indirect service model of providing services to students/clients and teachers/counselors; a problem-solving approach based on different data. Hanuláková, E., Dano, F., & Drábik, P. (2019) note that strategy for education and personal development of consultants should be a part of the consulting company strategy. Educational activity in the fields of management, marketing, and environmental consulting represents a continuous process that is factually and logically linked to other corporate processes. It requires a strategic and systematic approach. Lahav, O., Talis, V., Cinamon, R. G., & Rizzo, A. (2019) explain that the virtual interactive consulting agent system is an online virtual career center that supports freshman students in transition to higher education. This virtual counseling system, based on accumulative empirical knowledge for working students and

knowledge about effective career intervention, aims to guide first-year university students in combining study and work effectively.

A review of literary sources gives grounds to speak about the disclosure by scientists of the essence and features of consulting activities in the modern educational space, which is relevant in modern conditions.

The attention is focused on the analytical nature of consulting activities and their content, the constant activation of the processes of transformation and adaptation of educational activities of the educational space, and participants in the educational process and their professional activities are emphasized on the overview direction of the specified problem. The main areas of cooperation between educational institutions and consulting companies are characterized by scientific and methodological support of the educational process, conducting various studies for the needs of the educational industry, legal support of educational activities, and the importance of management consulting in the educational industry. Despite the range of issues considered in the works of scientists on consulting activities in the modern educational space, it can be argued that to date, there is no scientifically substantiated, holistic view of the features of consulting activities in the modern educational space in particular, support in the management of an educational institution of participants in the educational process through communication.

The purpose of the article is to substantiate the basic principles of consulting activities in the modern educational space and the formation of entrepreneurial competence of specialists to ensure a high-quality educational process throughout life.

Methodology

The methodological principles of the study are: leading provisions of the theory of scientific knowledge; general scientific principles of historicism, systematicity, and scientificity; conceptual provisions of pedagogical, psychological, and sociological sciences; ideas of experience based on the synchronous study of pedagogical, socio-cultural and economic phenomena; philosophical and pedagogical ideas for the development of modern education.

To achieve the stated goal, the following research methods were used: theoretical – analysis of methodological, psychological, pedagogical literature, comparison, synthesis, generalization and comparison, deduction and induction, which made it possible to characterize and substantiate the state of the development of the identified problem; generalization and systematization of methodological and theoretical principles to clarify the state of consulting activities in the modern educational space; generalization of the system for the formation of entrepreneurial competence of specialists to ensure high-quality consulting activities in the modern educational space; empirical – questionnaires, interviews, pedagogical observation, pedagogical experiment to determine the level of formation of entrepreneurial competence of specialists in order to ensure high-quality consulting activities in the modern educational space; methods of mathematical statistics – to process empirical data, to prove the reliability of the results of the pedagogical experiment.

The main tasks of the pedagogical experiment were as follows:

- Studying the essence and distinguishing the features of consulting activities in the modern educational space, clarifying the support of participants in the educational process through communication in the management of an educational institution, the state of the problem of the formation of pedagogical entrepreneurship of specialists in the works of scientists;
- Identifying the purpose of the study;
- Developing a research program;
- Testing the developed methodology, which included conducting a cycle of training seminars to form the readiness of a specialist for entrepreneurial activity to improve consulting activities in the modern educational space;
- Conducting, within the framework of the experiment, diagnostics of the methods used in the educational process.

During the ascertaining experiment, a survey was conducted among students of 1-2 years of higher education institutions, which was carried out to clarify the importance and necessity of forming a specialist's readiness for entrepreneurial activity, popularizing educational technologies and innovative ideas to

improve consulting activities in the modern educational space, and exchanging promising pedagogical experience. Forty respondents took part in this survey. At the ascertaining stage of the experiment, respondents were divided into CG and EG; indicators, criteria, and levels of formation of a specialist's readiness for entrepreneurial activity were substantiated; diagnostic tools were developed.

The validity of the obtained results and the objectivity of their assessment were ensured by applying a complex of various research methods, using a group of respondents from educational institutions to analyze the results.

To assess the homogeneity of experimental and control data, statistical processing was carried out using MS Excel and SPSS (Statistical Package for Social Science) programs.

In our article, we used quantitative methods of data collection and analysis. This group of empirical research methods includes methods of obtaining information about the object under study that allow us to identify its quantitative characteristics.

During the ascertaining experiment, it was concluded that students of higher education institutions are interested in forming a readiness for entrepreneurial activity and are positive about the possibility of creating a methodology that would include conducting a cycle of training seminars to form a specialist's readiness for entrepreneurial activity to improve consulting activities.

At the ascertaining stage of the study, we observe low indicators of the general level of formation of respondents' readiness for entrepreneurial activity to improve consulting activities. To identify, at the ascertaining stage of the study, differences in the initial levels of formation of respondents' readiness for entrepreneurial activity in the CG and EG, the method of testing statistical hypotheses (alternative and null) was used.

To establish the choice of one of the statistical hypotheses – null or alternative, the study used the criterion of agreement with the observation data – Pearson's criterion ("chi-square"), which answers the question of whether the differences between the levels of formation of respondents' readiness for entrepreneurial activity to improve consulting activities in the modern space are random in the CG and EG respondents.

The obtained results of the study indicate that respondents of both groups (CG and EG) are characterized by a similar attitude toward improving consulting activities in the modern space, the need for respondents to be prepared for entrepreneurial activity, showing interest in professional activities, and a positive attitude towards the chosen profession.

Analysis of the state of readiness of respondents for entrepreneurial activity at the stage of the ascertaining experiment confirms that respondents of the EG and CG are characterized by similar indicators regarding the initial state of readiness of respondents for entrepreneurial activity for improving consulting activities. We checked the reliability of the obtained results by calculating a complex indicator to determine the levels of readiness of specialists for entrepreneurial activity to improve consulting activities in modern society according to all criteria according to the results of the formative experiment.

The reliability of the obtained data and the reliability of the results of the experimental study were statistically verified using the Pearson χ^2 criterion.

Since the obtained results are significant at the 1% level ($>(0.01)$), the null hypothesis (H_0) is rejected, and the alternative hypothesis H_1 is accepted at a high level of significance that the general level of preparedness of specialists for entrepreneurial activity to improve consulting activities in modern society in CG and EG is significantly different.

The results of the experiment's formative stage demonstrated the effectiveness and feasibility of the methodology developed to improve consulting activities in the modern educational space. This methodology included a series of seminars and training sessions designed to prepare specialists for entrepreneurial activities.

Results and Discussion

Different approaches to the content of the concept of "consulting", the content of educational consulting, and the leading goal of consulting.

The conditions in which educational institutions operate today are conditions of uncertainty because, speaking about the probability of future events, they contain insufficient information and are a certain doubt about something. It is these conditions of uncertainty that activate the processes of changing the priorities of human life and its philosophy. The processes of transformation and adaptation of the educational activity of the institution in a constantly changing environment are activated, as well as the processes of professional activity of participants in the educational process. Therefore, a certain transformation of the methods and means of interaction of participants in the educational process in conditions of uncertainty is necessary to ensure the productive functioning of the educational institution. Therefore, there is a reorientation to adaptive principles and transformation of the institution's management system, ensuring the successful adaptation of each participant in the educational process to changes in the internal state and to external influences both in the collective and in their own, developing a common goal.

We are confident that the provision of consulting services will contribute to achieving the above.

Consulting – this is "the activity of consulting those who need help, or it is a consultation on a wide range of issues, both for professional activity and for adapting to life in conditions of uncertainty. Generally, consulting is understood as the activity of advising representatives of the organization's management system in the professional field (Riabova, 2022).

Consulting is "a complex of knowledge that enables the support of scientific research, research, conducting experiments and experiments organized to expand existing and obtain new knowledge, scientifically substantiate various projects, test scientific hypotheses, establish patterns and build scientific generalizations, which is carried out with the aim of successful development of the organization." (Bezkravnyy et al., 2015).

Consulting, which carries in its content consulting, is a process of intellectual activity of a group of persons or a person in the field of problems being consulted, the result of the implementation of consulting services is the formed recommendations for solving the tasks of the consulted problem, which allows the decision-maker (to make an optimal, compromise decision) to choose one of them, regarding the management and functioning of the management and functioning processes, while the implementation of the solution ensures the solution of the tasks of the consulted problem (Kononiuk, 2009).

So, having analyzed the approaches of different authors to the content of the concept of "consulting", we say that there is no unambiguity in understanding the essence of the singled-out concept and its content, and this issue has not yet been sufficiently considered.

Helping the management system in solving the tasks of the educational institution and achieving certain goals is the leading goal of consulting. Considering that education for an individual is a certain cognitive activity to acquire certain competencies, skills, knowledge, and methods of activity, we define the essence of educational consulting as a process of joint interaction between the recipient and the provider of "consulting services and making decisions regarding the resolution of any issues of the individual's life, including professional activity" (Yelnykova & Ryabova, 2021).

Educational consulting has its own classification according to the subject of consulting. For example, these may be issues: grant and financial issues, in conditions of uncertainty – issues of professional development, management of project activities of the institution, etc.

Educational consulting also has grounds for classification according to the method of providing consulting services: educational consulting (seminars, training, etc.), individual process consulting, and audit – expert consulting.

Like any service, educational consulting has its own product. In conditions of uncertainty, the following consulting service products are most in demand for an educational institution: determining ways to attract consumers to the services provided by the institution and clarifying the contingent of the institution;

developing an educational institution's strategy in conditions of uncertainty; based on the use of knowledge management technology, managing the development of the intellectual potential of an educational institution; optimizing the institution's activities; preparing, examining, implementing both grant projects and investment projects; forming appropriate educational services and researching educational needs; support and organization of dual education in an educational institution, etc.

In the management of an educational institution, educational consulting is aimed at solving the task through meetings, communication, etc., to support participants in the educational process and, in conditions of uncertainty, to facilitate the adoption by participants in the educational process of decisions regarding the effective functioning of the institution (Riabova, 2022).

Therefore, "the main goal of consulting is to help, for example, in formulating a real goal of activity, or in achieving certain goals and solving set tasks, etc." (Riabova & Kotelevets, 2022).

Innovative consulting activities in education are aimed at improving the quality of management activities, which is a reliable mechanism for ensuring the competitiveness of higher education institutions and the needs of educational activity subjects. However, consulting management is not fully implemented in the higher education system, which necessitates the design of the outlined activities.

The subjects of educational consulting activities are teaching staff of higher education institutions, managers, scientific and pedagogical workers, and public organizations that participate in the implementation, application of educational consulting, development, and design; the object of educational consulting activities is the activities of teaching staff, managers, scientific and pedagogical workers with the use of educational consulting, i.e., educational consulting activities (Drahunova, 2023).

As the analysis of the practice of providing consulting services shows, higher education institutions are among the educational structures that provide such services. They can also be educational, methodological, scientific, and educational centers, agencies, etc. Let us list the types of consulting services that they provide:

- Assisting in solving problems related to learning difficulties, choosing educational preferences for education seekers;
- Assisting in the development of educational institutions in developing programs through individual, group, and corporate training and consulting;
- Conducting local psychological and pedagogical research and diagnostic work for experimental sites, innovative organizations, scientific and methodological centers, institutions, and educational institutions to identify promising areas of development and generalize work experience;
- Implementing innovative developments in the field of education under contracts and on state orders with various organizations and institutions;
- Consulting in the field of labor legislation and educational legislation;
- Assisting in the field of education in analyzing the results of research and experimental work, distance technologies, and corporate learning;
- Conducting independent expertise and psychological and pedagogical audits of innovations, methods, technologies, and teaching aids;
- In processing applications for grants, information support in the field of education and industry sciences;
- Consulting services in various fields of science on scientific and methodological support of research;
- Assisting in developing publishing projects, educational projects, preliminary publishing preparation, and creating scientific and scientific and methodological texts;
- Organizing group and individual internships, training coaches and tutors – implementing various teacher training programs;
- Developing, designing, filling information resources and educational platforms, in particular, popularizing and developing websites on education and training;
- Organizational, methodological, and scientific assistance in conducting scientific and methodological, scientific and practical scientific conferences on important problems of education;
- Assistance in adapting to the conditions of domestic education for foreign citizens. Consulting services are currently provided to educational structures by consulting centers of institutions and organizations specialized consulting companies of various sectors of the economy (Khomenko, 2020).

Ensuring high-quality consulting activities in the modern educational space to form the entrepreneurial competence of specialists.

To train a high-quality specialist, the educational process of higher education should be provided with high-quality consulting activities in the modern educational space. A specialist must have a high level of entrepreneurial competence through the system of forming entrepreneurial competence of specialists, which is facilitated by ensuring high-quality consulting activities in the modern educational space.

Entrepreneurial competence encompasses innovation, creativity of the individual, taking risks for the benefit of his or her activities, as well as the ability to manage and plan projects to achieve the set goal. Entrepreneurial competence is manifested in the ability of an individual to translate his or her ideas into action (Lahav et al., 2020).

To successfully form entrepreneurial competence, it is necessary to use innovative forms of work, in particular training:

- Leadership training: personnel management, negotiations;
- Professional training: marketing training, business training, corporate training, business education;
- Communication training: interpersonal communication, successful negotiations, conflict resolution, the formation of communication skills;
- Socio-psychological training, which is focused on the development of the entrepreneur's personality and socio-psychological characteristics.

Providing high-quality consulting activities in the modern educational space contributes to the formation of entrepreneurial competence in future specialists because knowledge and understanding of the features and conditions of consulting activities are necessary for the younger generation, which will enter independent adulthood. Purposeful provision of high-quality consulting activities in the modern educational space to form entrepreneurial competence of specialists will contribute to the full development of a personality that is ready to freely choose a life path, improve, and change the conditions of society and its own life (Stratan-Artyshkova et al., 2022).

Let us highlight the components of the entrepreneurial competence of specialists, including:

- The ability to innovative thinking to ensure high-quality consulting activities in the modern educational space; to make decisions in consulting activities; to switch to an alternative strategy for achieving the goal in the modern educational space; the ability to work beyond the proposed requirements in conditions of uncertainty more and faster; the ability to quickly assess innovative social and economic conditions for entrepreneurial activity; to develop business plans for the development of new areas of activity, products, organizations; to draw attention to oneself; the ability to critically assess personal advantages and disadvantages of consulting activities in the modern educational space;
- Readiness for professional and personal self-development; to take responsibility for the consequences of decisions; the ability to manage risk;
- The ability to find innovative solutions to problems in standard and non-standard situations; to generate promising ideas; the ability to communicate with different partners, to search for new market opportunities for professional activity; establish relationships with partners, conclude effective agreements, negotiate; ability to create working and business networks of different participants; ability to ensure optimal allocation of resources between projects and operations (Bida et al., 2021).

Consulting functions and trends that determine the development of consulting services.

For the educational sector, the relevance of consulting is due to the diversity of functions that it performs.

The most significant are the following:

- **Research** – identifying patterns and factors that directly affect the educational institution; processing and collecting factors that have a significant impact on the results of the educational institution's work;
- **Consulting function** – analyzing and identifying the assigned management tasks; providing assistance in solving management problems; developing proposals for solving the assigned management tasks; monitoring the effectiveness of the implementation of proposals;

- **Mediation** – establishing identified connections with potential subjects during cooperation;
- **Educational** – improving professional qualifications;
- **Scientific function** – disseminating promising management experience and modern scientific achievements (Khomenko, 2020).

To develop a higher education institution and ensure its stable functioning, the head uses, in addition to the above-mentioned basic ones, the following innovative functions of consulting services:

- **Knowledge accumulation** – design and management technologies, database formation;
- **Transmission** – administrative and financial activities, educational process, management innovation process, activities of public organizations;
- **Marketing** – positioning and marketing of a higher education institution, optimization of management activities and activities in the educational services market and the labor market;
- **Transformational** – formation of a strategy for the development of a higher education institution, innovation strategy; financial management and innovative development; motivation, leadership, personnel management, increasing the competitiveness of an educational institution; encouragement of round tables, seminars, thematic discussions, etc.;
- **Counteraction to quasi-consulting** – use of administrative apparatus, formation of identity systems, and protection of consulting services;
- **Disruptive** – expansion of consulting services of an educational institution; dissemination and implementation of design technologies;
- **Ethical** – to ensure the development of the consulting services environment – the formation of informal institutions;
- **Formation of new institutions** – to use and form the potential of higher education, training personnel – the accumulation of offers from the external service market;
- **Rationalizing** – by providing information and specialized knowledge – increasing the efficiency of management activities; use and optimization of higher education resources; professional assistance in the rationalization of the management process;
- **Innovative** – involving integrated innovations in the activities, professional assistance in the implementation of experience in management practice, new knowledge, implementation of an innovative system process, increasing the innovative activity of a higher education institution, development of innovative activities;
- **Regulatory** – through the prospects for the functioning and development of a higher education institution, providing professional assistance in solving emerging problems – optimization of the managerial behavior of subjects of the educational process (Voskoboinikov et al., 2023).

It should be noted that the skills and knowledge of the head of a higher education institution regarding the implementation of consulting services are the basis for the identified functions.

The implementation of such functions of consulting services will contribute to the transition to innovative, creative activity from the regulatory activity and will provide for an innovative, progressive change like management.

Let us highlight the trends that determine the development of consulting services:

- Technical progress, which in the areas of social interdependence leads to the complication of relationships, leadership development, ensuring well-being, quality of education, decision-making, etc. – as a result of which the needs for interaction and cooperation between social groups and individuals increase;
- The presence of consulting potential of various ranks of employees. This is manifested in the fact that many of these employees have the potential skills of teachers, advisors, consultants, instructors, and trainers and can perform (with appropriate training) the functions of internal consultants in social groups and their organizations;
- Irrational use of human resources or their crisis – insufficient consideration of people of different age groups, gender factors, characteristics of ethnic minorities, citizens without education, and people with disabilities (Skrypnyk, 2021).

Various aspects of consulting services in the field of higher education and methodological recommendations for their inclusion in the system of activities of a higher education institution.

In the field of higher education, consulting services are considered in two aspects:

- As a service provided within the framework of the external activities of an educational institution;
- As a service that, in the system of internal activities of an educational institution, is an important tool for increasing management efficiency and is implemented by improving the management processes of educational entities, minimizing costs, and introducing and creating organizational and managerial innovations in the structure of the development of internal activities (Shetelya et al., 2023).

Complementary channels for educational entities to receive professional assistance are external and internal activities, in particular, in solving strategic and innovative and current problems of the activities of a higher education institution. In the system of external activities of a higher education institution, the tasks of consulting services are more ambitious than the goal of traditional consulting of entities carrying out educational activities. This happens because:

- The complex of consulting services is not limited to management issues, it includes issues of a scientific, informational, educational, cultural, institutional, infrastructural, sociological, labor, mental, and other nature;
- The list of users of consulting services (public structures, citizens, legal entities, and individuals) is increasing;
- Consulting services perform several important innovative functions (Drahunova, 2023b).

The present indicates the need to develop a theoretical basis and management tools, therefore we propose to direct the improvement of the theoretical basis and management tools to the implementation of consulting activities. To develop and modernize a competitive, promising institution, change the management style, increase the level of design, and restructure the organizational and planning training of management, we propose to take these features into account in the system of external activities of a higher education institution when forming methodological support for the management of consulting services (Knysh et al., 2023).

External and internal principles of consulting services in the modern educational space and features of consulting services of educational activity subjects to promote the management culture of future specialists.

Important for ensuring high-quality external activities of a higher education institution is the singled out dual nature of educational consulting services, which is considered as an element of the system for increasing the efficiency of professional activities in a higher education institution and as a tool for minimizing the costs of external actions of an educational institution, which is a feature of consulting services of educational activity subjects of a higher education institution (Shuliak et al., 2022).

This necessitates the separation of internal and external principles of consulting services. Goal-setting, flexibility, continuity, systematicity, balance, scientificity, etc., belong to the internal principles of consulting services. State support, recognition, predictability of the state's European integration aspirations and changes in institutional conditions, completeness and systematicity, effectiveness of consulting for the educational sector, and promotion of the development of consulting experts belong to the external principles of consulting services (Drahunova, 2023a).

In a higher education institution, the features of consulting services of educational entities include those that are based on the nature of the source of management activity (external and internal determinants, higher level of competition, market and geographical instruments, number of consumers, efficiency indicators, level of complexity, nature of the relationship between the recipient and the provider of services, systematicity, and comprehensiveness of the service) (Erchul, 2023). Consulting activity is an independent branch of activity and science and has not only the nature of a functional management system aimed at ensuring and forming conditions for the development of a higher education institution. In education, consulting activity is characterized by four positions as the organization of management activity:

- Management structures (organizational structure, activity design, technology, functions);

- Activities of educational process entities (educational process technologies, activity design, scientific activity, workload, advanced training);
- Work of the HEI as a whole (type of institution, operating mode, mission, strategy);
- Work of education seekers (taking into account individual characteristics and level of education).

Within the framework of the modern market economy, a special place in education is occupied by consulting management, which creates the necessary innovative conditions for the effective and high-quality functioning of the educational sphere to promote the formation of interaction between elements of the complex of consulting services, servicing higher education institutions. Management objects should develop faster, compared to other elements of the complex of consulting services, to actively influence its formation as a holistic, innovative modern education system. Therefore, as a complex mechanism of action of a managed system, we consider consulting management in education, which creates favorable conditions and opportunities for consulting activities to achieve and develop effective results (Drahunova, 2023a).

In the field of higher education institution management, we will name the main prerequisites for the development of consulting:

- Implementation of the concept of human capital (the main provisions of the concept of human capital are based on personnel investments);
- The need to ensure the quality of educational services and solve the problems of increasing the efficiency of the higher education institution (the most active asset of which is intellectual capital);
- In the field of higher education institution activities, the demand for consulting services;
- Increasing understanding of the modern realities of managerial competence of managers at different levels;
- To study the best world achievements – increasing the scientific content of managerial activities, which requires the specialists of the educational institution experience in implementing projects, skills in scientific activity in the field of HEI activities, etc. (Sabov, 2021).

Innovations in education and current trends require innovative approaches to managing a higher education institution (Drahunova, 2023a).

Consulting has its own characteristics in the educational sector, which are determined by the specifics of the educational sector:

- Educational structures themselves provide consulting services to individuals, various companies, and population groups;
- Individual employees of the educational sector and educational institutions in the field of professional self-improvement are potential consumers of consulting services, resource provision of the educational process, positioning in the market of educational services, personal development, scientific research, and development, etc.

Organization and methodology of conducting a pedagogical experiment.

Consulting company "Activ Group Consulting" conducted a sociological study of the quality of modern education. About 10 thousand people were surveyed by specialists. The quality of education was rated by respondents (3.5 points on a five-point scale) as a solid "three".

At the same time, general secondary education scored 3.4 points, and higher education scored 3.6 points (0.2 points more).

53.7% of respondents (the majority of respondents) place responsibility for correcting the situation on the central authorities. In particular, in the section assessing state control over the education system, this same number of respondents supported the statement that "state control over the educational process is too weak". 8.2% of respondents agreed with the opposite statement: "state control is too strong" (UIFuture, 2017).

A study of the quality of modern education showed the need for objective and evidence-based verification of the effectiveness of the methodology for forming a modern specialist's pedagogical entrepreneurship. Therefore, the next stage of the study was the implementation of experimental work by us.

The pedagogical experiment was carried out in the following areas of its implementation:

- During the experiment, the possibility of introducing new changes to the educational process to increase the effectiveness of education was envisaged;
- Ensuring compliance with the conditions that reveal the connection between the impact of implementing the updated system for forming a teacher's pedagogical entrepreneurship and the obtained result;
- Evaluating the results of diagnosing the states of the pedagogical process during the experiment.

The main tasks of the pedagogical experiment were as follows:

- Studying the essence and distinguishing the features of consulting activities in the modern educational space, clarifying the support of participants in the educational process through communication in the management of an educational institution, the state of the problem of forming pedagogical entrepreneurship of specialists in the works of scientists;
- Identification of the research objective;
- Development of the research program;
- Testing of the developed methodology, which included conducting a series of training seminars to form a specialist's readiness for entrepreneurial activity to improve consulting activities in the modern educational space;
- Conducting, within the framework of the experiment, diagnostics of the methodology used in the educational process.

The research was conducted in three stages.

At the first – theoretical stage – the essence and features of consulting activities in the modern educational space were studied, the support of participants in the educational process was clarified through communication in the management of the educational institution, the state of the problem of the formation of pedagogical entrepreneurship of specialists in the works of scientists, and theoretical analysis of the research concepts were conducted.

The pathways for ensuring high-quality consulting activities in the modern educational space have been identified to foster the entrepreneurial competence of specialists. The functions of consulting and the trends driving the development of consulting services have been revealed, along with the external and internal principles of consulting services in the modern educational space. Additionally, the specific features of consulting services for educational activity participants have been highlighted, aiming to promote the managerial culture of future specialists.

The second stage – ascertaining – involved clarifying the real state of formation of a specialist's readiness for entrepreneurial activity to improve consulting activities in the modern educational space and developing a program and methodology for research and experimental work. For experimental verification, a methodology was developed that included conducting a cycle of training seminars to form a specialist's readiness for entrepreneurial activity to improve consulting activities in the modern educational space. To improve consulting activities in the modern educational space, ascertaining diagnostics were conducted with higher education applicants to analyze their opinions on the need to form readiness for entrepreneurial activity.

The third stage, the formative one, made it possible to verify the effectiveness of the developed methodology to improve consulting activities in the modern educational space, which included conducting a series of training seminars to form the readiness of specialists for entrepreneurial activity.

Results of the ascertaining stage of the experiment and their analysis.

At the ascertaining stage, a survey was conducted among students of 1-2 years of higher education institutions, which was carried out to clarify the importance and necessity of forming a specialist's readiness for entrepreneurial activity, popularizing educational technologies and innovative ideas to improve consulting activities in the modern educational space, and exchanging promising pedagogical experience. Forty respondents took part in this survey.

At the ascertaining stage of the experiment, respondents were divided into CG and EG; indicators, criteria, and levels of formation of a specialist's readiness for entrepreneurial activity were substantiated; diagnostic tools were developed.

Respondents were asked to answer the questions of the questionnaire. Analysis of the answers showed that (Fig. 1):

- 85% of respondents answered that it is worth paying attention to the formation of a specialist's readiness for entrepreneurial activity in the education process to improve consulting activities in the modern educational space;
- 70% of respondents consider it necessary to introduce a system for the formation of pedagogical entrepreneurship in higher education institutions to improve consulting activities in the modern educational space;
- 51% of respondents believe that the formation of pedagogical entrepreneurship and the improvement of consulting activities in the modern educational space are influenced by economic, political, financial, and – external factors;
- 49% of respondents prefer the ability to take risks, motivation for entrepreneurial activity, the ability to commercialize their own entrepreneurial ideas, the justification of management decisions, and the improvement of consulting activities in the modern educational space – internal factors.

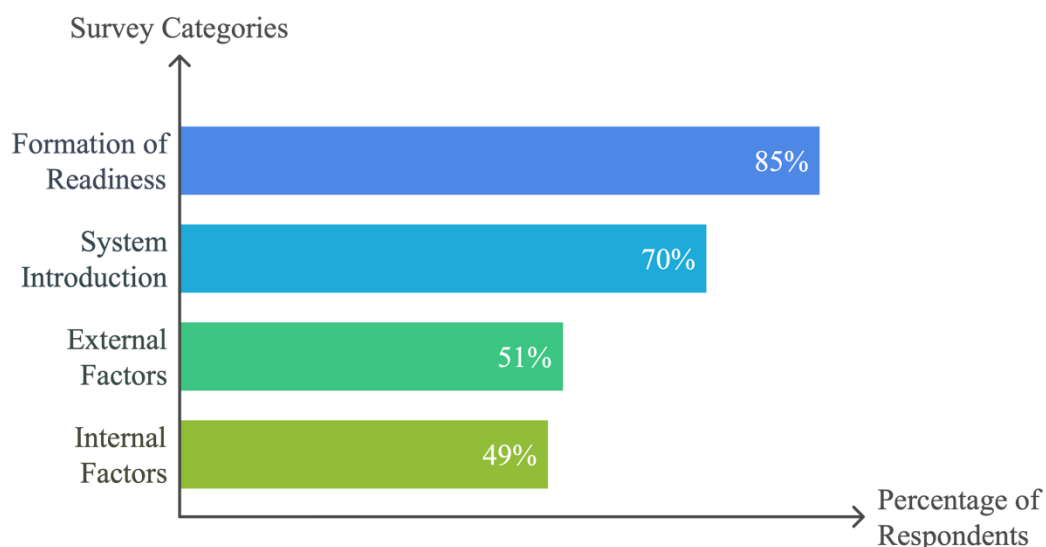


Figure 1. Survey Responses on Entrepreneurial Readiness in Education.

Source: developed by the authors.

Respondents identified the following, the most convenient forms of acquiring and improving qualifications, which contribute to the formation of a specialist's readiness for entrepreneurial activity to improve consulting activities in the modern educational space (Fig. 2):

- 70% of respondents prefer training seminars to form a specialist's readiness for entrepreneurial activity to improve consulting activities in the modern educational space;
- 20% of respondents prefer coworking;
- 5% of respondents prefer hackathons;
- 5% of respondents prefer webinars.

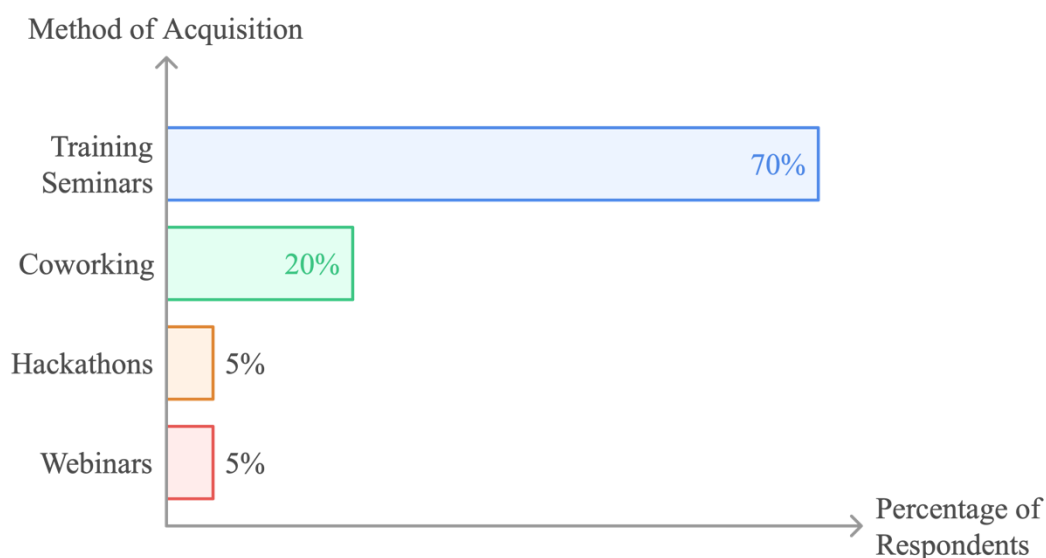


Figure 2. Preferred Methods for Acquiring Qualifications.

Source: developed by the authors.

The respondents' answers to the question about the possibility of entrepreneurship in the field of education to improve consulting activities in the modern educational space were interesting (Fig. 3):

- 70% of respondents answered positively,
- 27% of respondents answered negatively, explaining this by the difficulty of forming initial capital;
- 3% of respondents could not answer.

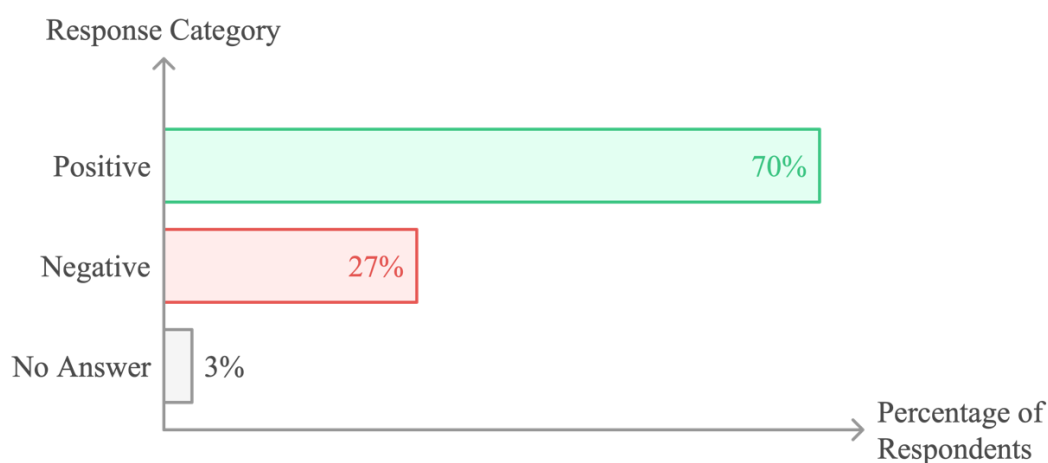


Figure 3. Respondents' Views on Entrepreneurship in Education.

Source: developed by the authors.

It should be noted that the results of the ascertaining experiment showed that (Fig. 4):

- 57% of respondents see themselves as entrepreneurs at any stage of their lives;
- 40% of respondents do not see such a prospect;
- 3% of respondents believe that education and entrepreneurship are not compatible.

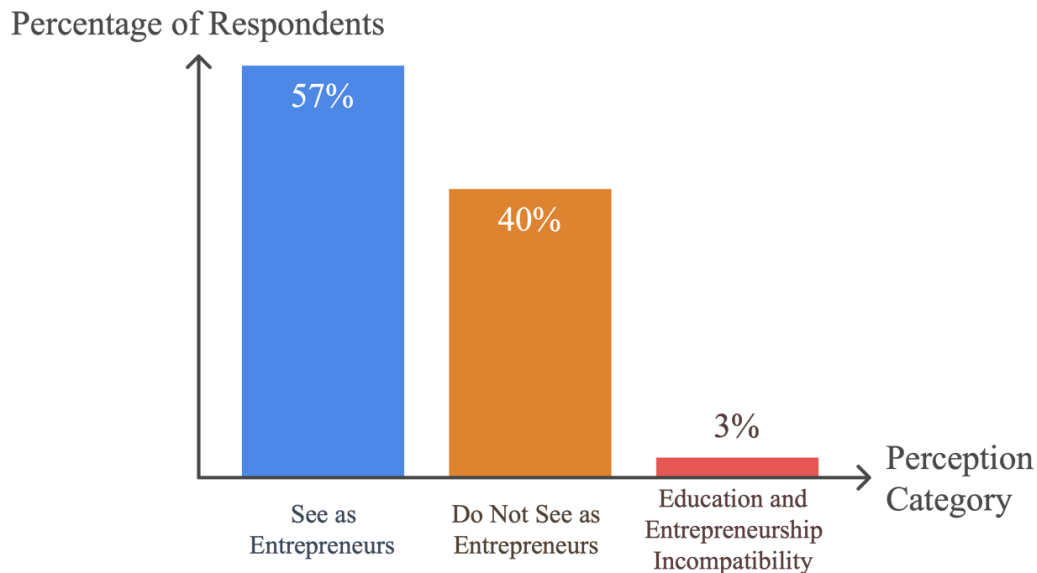


Figure 4. Perceptions of Entrepreneurship Among Respondents.

Source: developed by the authors.

Thus, we conclude that students of higher education institutions are interested in forming readiness for entrepreneurial activity and are positive about the possibility of creating a methodology that would include conducting a cycle of seminars-trainings to form a specialist's readiness for entrepreneurial activity to improve consulting activities.

The overall level of readiness for entrepreneurial activity is recorded by the following indicators (Fig. 5):

- 23% of respondents in the CG and 26% of respondents in the EG have a high level of readiness for entrepreneurial activity;
- 41% of respondents in the CG and 42% of respondents in the EG have an average level of readiness for entrepreneurial activity;
- 36% of respondents in the CG and 32% of respondents in the EG have a low level of readiness for entrepreneurial activity.

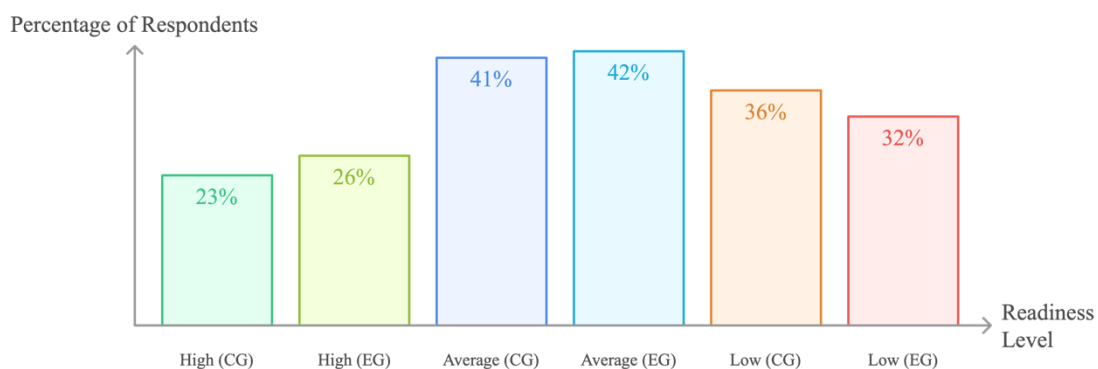


Figure 5. Entrepreneurial Readiness Levels Comparison.

Source: developed by the authors.

At the ascertaining stage of the study, we observe low indicators of the general level of readiness for entrepreneurial activity among respondents to improve consulting activities. To identify, at the ascertaining stage of the study, differences in the initial levels of readiness for the entrepreneurial activity of respondents in the CG and EG, the method of testing statistical hypotheses (alternative and null) was used.

The experimental method, in particular, to confirm its effectiveness, provided for testing statistical hypotheses – alternative and null.

Alternative hypothesis (H1): there are statistically significant differences between the levels of professional competence of students in the EG and CG in the experimental groups, to improve consulting activities in the modern space, a higher level of readiness for entrepreneurial activity among respondents is explained by the fact of the introduction of the experimental method.

Null hypothesis (H0): there are no statistically significant differences between the levels of professional competence of respondents in the EG and CG; perhaps the slightly higher level of readiness of respondents for entrepreneurial activity in the experimental groups is explained by random factors.

To determine the choice of one of the statistical hypotheses – null or alternative, the study used the criterion of agreement with the observation data – Pearson's criterion ("chi-square"), which answers the question of whether the differences between the levels of readiness of respondents for entrepreneurial activity to improve consulting activities in the modern space are random in the CG and EG respondents.

The results of the study indicate that respondents in both groups (CG and EG) are characterized by a similar attitude toward improving consulting activities in the modern space, the need for respondents to be prepared for entrepreneurial activity, showing interest in professional activities, and a positive attitude towards the chosen profession.

Analysis of the state of readiness of respondents for entrepreneurial activity at the stage of the ascertaining experiment confirms that respondents of the EG and CG are characterized by similar indicators regarding the initial state of readiness of respondents for entrepreneurial activity for improving consulting activities.

Analysis of the results of the formative stage of the experiment.

As a result of the formative stage of the experimental study, the effectiveness of the developed methodology was tested to improve consulting activities in the modern educational space, which included a cycle of training seminars to form the readiness of specialists for entrepreneurial activity.

Comparatively processed experimental data were processed to clarify the dynamics of the formation of the readiness of specialists for entrepreneurial activity to improve consulting activities in modern society.

For example, during one of the training seminars on the topic "Motivation for entrepreneurial activity as a problem of improving consulting activities", respondents discussed the following questions:

- What does consulting activity in the educational process and entrepreneurial activity mean to you?
- Tell us what, in your opinion, the functions of consulting and trends that determine the development of consulting services are the most effective.
- Name the external and internal principles of consulting services in the modern educational space and the features of consulting services of educational entities to promote managerial culture and entrepreneurial activity.

Students also evaluated each of the following factors and noted to what extent it can influence the decision to become a teacher-entrepreneur:

- Would entrepreneurial activity contribute to your realization as a person? How exactly?
- Has your motivation for entrepreneurial activity increased as a result of improving consulting activity after implementing the methodology (motives of freedom and independence, motives of commercial success, motives of initiative and activity, motives of respect and self-esteem, self-realization)?
- What common features do entrepreneurial activity and pedagogical activity have, in your opinion?
- Name the pros and cons of work and entrepreneurial activity.
- Do you consider consulting activity and entrepreneurial activity as the main part of your income?

Summing up the results of the training seminars related to the developed methodology to improve consulting activities in the modern educational space motivation for entrepreneurial activity as a problem of improving consulting activities, we note that:

- 75% of respondents mentioned the motives of freedom and independence;
- 65% of respondents indicated that the motives of commercial success increased with the help of the proposed methodology. At the same time, a significant part of the respondents – 40%, mentioned the influence and compulsion of life circumstances as one of the reasons for entering entrepreneurial activity;
- 36% of respondents noted the presence of motives of self-esteem and respect in them.
- 30% of respondents noted the presence of motives of self-realization in them;
- 28% of respondents indicated the motives of activity and initiative. They noted that they were always interested in business, imagined for themselves just such an activity, entrepreneurship for them “is everything”.

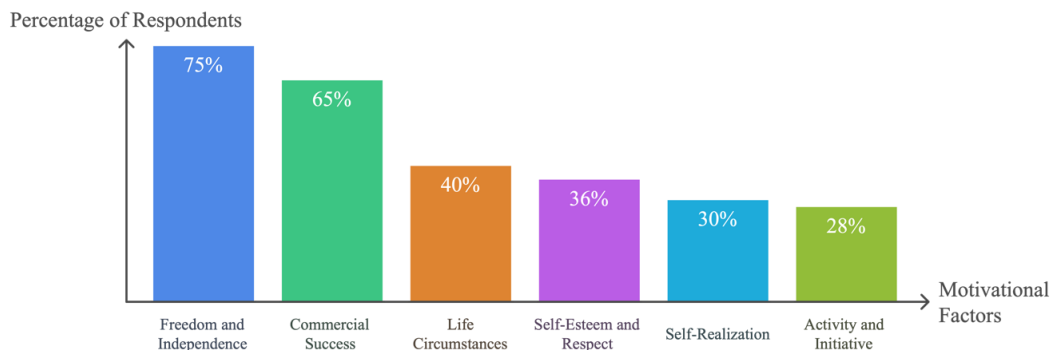


Figure 6. Motivations for Entrepreneurial Activity.

Source: developed by the authors.

The results of assessing the level of preparedness of specialists for entrepreneurial activity to improve consulting activities in modern society after the formative stage of the experiment according to the incentive criterion showed positive level dynamics in the EG, namely the levels were distributed as follows:

- **Low level** – shown by 20% of CG respondents, and in the EG, this indicator is 7% of respondents;
- **Medium level** – shown by 39% of CG respondents and 24% of EG respondents;
- **High level** – demonstrated by 41% of CG respondents and 69% of EG respondents in the CG.

The results of assessing the level of preparedness of specialists for entrepreneurial activity to improve consulting activities in modern society after the formative stage of the experiment according to the content criterion showed positive level dynamics in the EG, namely the levels were distributed as follows:

- **Low level** – shown by 29% of respondents in the CG, and in the EG, this indicator is 11% in relative terms;
- **Medium level** – shown by 39% of respondents in the CG and 20% of respondents in the EG;
- **High level** – shown by 32% of respondents in the CG, and in the EG, this indicator is 69% of respondents.

The results of assessing the level of preparedness of specialists for entrepreneurial activity to improve consulting activities in modern society after the formative stage of the experiment according to the activity criterion showed positive level dynamics in the EG, namely the levels were distributed as follows:

- **Low level** – shown by 28% of respondents in the CG, and in the EG, this indicator is 9% in relative terms;
- **Medium level** – shown by 40% of respondents in the CG and 36% of respondents in the EG;
- **High level** – demonstrated by 32% of respondents in the CG, and the EG this indicator is 55% of respondents.

The results of assessing the level of preparedness of specialists for entrepreneurial activity to improve consulting activities in modern society after the formative stage of the experiment using the reflexive-

evaluative criterion showed positive level dynamics in the EG, namely the levels were distributed as follows:

- **Low level** – demonstrated by 26% of respondents in the CG and the EG, this indicator is 9% in relative terms;
- **Medium level** – demonstrated by 39% of respondents in the CG and 28% of respondents in the EG;
- **High level** – demonstrated by 35% of respondents in the CG and the EG; this indicator is 63% of respondents.

According to the results of the diagnostics of the general level of formation of specialists' readiness for entrepreneurial activity to improve consulting activities in modern society after the formative stage of the experiment:

- **High level** of formation in the CG increased by 12%, and in the EG – by 38%;
- **Medium level** of formation in the CG decreased by 1%, and in the EG, it decreased by 14%;
- **Low level** of formation in the CG decreased by 11%, and in the EG – by 24%.

We checked the reliability of the obtained results by calculating a complex indicator for determining the levels of formation of specialists' readiness for entrepreneurial activity to improve consulting activities in modern society according to all criteria according to the results of the formative experiment.

The reliability of the obtained data and the reliability of the results of the experimental study were statistically verified using the Pearson χ^2 criterion.

Since the obtained results are significant at the 1% level ($>(0.01)$), the null hypothesis (**H0**) is rejected, and the alternative hypothesis **H1** that the general level of preparedness of specialists for entrepreneurial activity to improve consulting activities in modern society in the CG and EG is significantly different is accepted at a high level of significance.

The results of the formative stage of the experiment proved the effectiveness and feasibility of the developed methodology to improve consulting activities in the modern educational space, which included conducting a cycle of training seminars to form the readiness of specialists for entrepreneurial activity.

Modern trends and innovations in education require innovative approaches to the management of a higher education institution. Today's realities indicate the need to develop a theoretical basis and management tools aimed at implementing consulting activities. The need for the studied activity in a higher education institution is due to the creation of an adapted organizational and economic mechanism focused on the development and modernization of a promising, competitive institution, restructuring the organizational and planning training of management, increasing the level of design, changing the management style.

It is considered important to solve the problem of forming demand for consultant services. Due to the undeveloped demand in the consulting business, there is no competition for quality, therefore, competition between companies today is based on attracting new clients for consulting in general, and not on increasing the level of professional consulting.

It is too early to talk about a fully formed market for consulting services in Ukraine. On the one hand, there is a network of domestic consulting companies that have regular clients. At the same time, the demand for their services is not yet sufficiently developed and structured. Often this demand is formed under the influence of the state.

The current problems in developing the domestic consulting services market that needs to be resolved include insufficient information about the goals and objectives of consulting, the absence of unified criteria for assessing the professionalism of consultants, the absence of a clear pricing policy in the field of consulting services, an underdeveloped scientific and methodological base for providing services, and the high price of consulting services for small businesses.

The most promising areas in the consulting services market are tax, management, investment consulting, construction engineering, project modulation, and IT consulting. Probably, in connection with the new

crisis caused by military aggression on the territory of Ukraine, a certain demand for anti-crisis management services will be formed.

The prospect of further research is seen in scientific research and the development of practical recommendations for pedagogical, scientific, and pedagogical workers and heads of higher education institutions regarding the design of consulting activities in a higher education institution.

Discussion of the results of the work already done by scientists from different countries (disclosure by scientists of the essence and features of consulting activities in the modern educational space, characterization of the main areas of cooperation between educational institutions and consulting companies, etc.) required further development. Therefore, comparing the results of already conducted research and analyzing their consequences, we set the goal of substantiating the basic principles of consulting activities in the modern educational space and forming the entrepreneurial competence of students to ensure a high-quality educational process throughout life. To this end, we developed a methodology that included conducting a cycle of training seminars to form a specialist's readiness for entrepreneurial activity to improve consulting activities in the modern educational space and tested the effectiveness of the author's methodology used in the educational process. The results of the formative stage of the experiment proved the effectiveness and feasibility of the developed methodology to improve consulting activities in the modern educational space; which included a cycle of training seminars to form the readiness of specialists for entrepreneurial activity.

Research limitations.

The experimental study was developed in the conditions of the real educational process and was implemented during the 2022–2024 academic years. The experimental study covered higher education applicants (students of 1-2 years of higher education institutions) – 40 respondents at the ascertaining stage of the study and 130 respondents at the formative stage of the study.

The results of the study are valuable for future research by scientists. In particular, a methodology was developed that included a cycle of training seminars to form the readiness of a specialist for entrepreneurial activity to improve consulting activities in the modern educational space and conducting diagnostics of the author's methodology used in the educational process within the framework of the experiment. It showed the necessity and significance of such development for education and requires further improvement in the educational process of higher education.

The originality and relevance of the study are due to the active innovative development of consulting in connection with modern global transformations in all spheres of human life. The scope of consulting activities has expanded to solve problems in the management of educational institutions, labor relations, healthcare, social security, etc. Consulting services in the educational sphere are increasingly being used.

The active development of a modern digital society requires the use and implementation of consulting in the educational sphere at a professional level to provide high-quality educational services and ensure the quality of education.

What is necessary in our time is support through communication in the management of an educational institution of participants in the educational process, as well as the disclosure of the essence and features of consulting activities in the modern educational space, which speaks of the importance and relevance of the topic of our research.

Conclusions

The study examines various approaches to the content of "consulting", the importance of educational consulting, the leading goal of consulting, and ways to ensure high-quality consulting activities in the modern educational space are clarified to form the entrepreneurial competence of specialists. The components of the entrepreneurial competence of specialists are identified. The main functions of consulting and trends determining the development of consulting services are shown. Various aspects of consulting services in higher education are proposed, and methodological recommendations are given for their consideration in the system of activities of a higher education institution. The external and internal

principles of consulting services in the modern educational space and the features of consulting services of educational entities are revealed to promote the formation of a managerial culture of future specialists.

An experimental study was conducted, during which the following was carried out: studying the essence and distinguishing the features of consulting activities in the modern educational space, clarifying the support of participants in the educational process through communication in the management of an educational institution, the state of the problem of forming pedagogical entrepreneurship of specialists in the works of scientists; identifying the purpose of the study; developing a research program; testing the developed methodology, which included conducting a cycle of seminars-trainings to form the readiness of a specialist for entrepreneurial activity to improve consulting activities in the modern educational space; conducting, within the framework of the experiment, diagnosing the methodology used in the educational process.

During the ascertaining experiment, it was concluded that students of higher education institutions are interested in forming readiness for entrepreneurial activity and are positive about the possibility of creating a methodology that would include conducting a cycle of seminars-trainings to form the readiness of a specialist for entrepreneurial activity to improve consulting activities.

At the ascertaining stage of the study, we observe low indicators of the general level of formation of respondents' readiness for entrepreneurial activity to improve consulting activities.

We have verified the reliability of the results obtained by calculating a complex indicator to determine the levels of formation of specialists' readiness for entrepreneurial activity to improve consulting activities in modern society according to all the identified criteria according to the results of the formative experiment. The reliability of the obtained data and the reliability of the results of the experimental study were statistically verified using the Pearson χ^2 criterion.

The results of the experiment's formative stage confirmed the effectiveness and feasibility of the methodology developed to improve consulting activities in the modern educational space. This methodology included a series of seminars and training sessions designed to prepare specialists for entrepreneurial activities.

The contribution of the study to the field of educational consulting is that we have developed a methodology that includes conducting a series of training seminars to form the readiness of specialists for entrepreneurial activity, improve consulting activities in the modern educational space, motivate students for entrepreneurial activity as an important problem for improving consulting activities, and popularize educational technologies and innovative ideas to improve consulting activities in the modern educational space.

We see the prospect of further research in further scientific research of the problem and the development of recommendations for designing consulting activities in higher education institutions for heads of higher education institutions and developing ways to support participants in the educational process through communication in the management of an educational institution.

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Threats to critical infrastructure: A study of transnational organized crime in Ukraine

Загрози об'єктам критичної інфраструктури: дослідження транснаціональної організованої злочинності в Україні

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Abstract

The purpose of the article is to study the nature and content of threats to critical infrastructure facilities related to the activities of transnational organized criminal groups. In the course of the research, the following scientific methods were used: historical, monographic, logical, dogmatic, normative analyses, system and structural, legal modelling, prognostic, summarization. The conceptual apparatus and criteria for classification of threats to state security, proposed in the scientific literature and relevant legal instruments are considered. The authors' definition of the concept of "threats to critical infrastructure facilities related to the activities of transnational organized criminal groups" is proposed. The threats to critical infrastructure facilities related to the activities of transnational organized criminal

Анотація

Метою статті є дослідження сутності та змісту загроз об'єктам критичної інфраструктури, пов'язаних з діяльністю транснаціональних організованих злочинних угруповань. У ході дослідження використовувалися такі наукові методи: історичний, монографічний, логічний, догматичний, нормативного аналізу, системно-структурний, правового моделювання, прогностичний, узагальнення. Розглянуто понятійний апарат та критерії класифікації загроз державній безпеці в науковій літературі та нормативно-правових актах. Запропоновано дефініцію поняття «загрози об'єктам критичної інфраструктури, пов'язані з діяльністю транснаціональних організованих злочинних угруповань». Також, авторами виокремлено загрози об'єктам критичної інфраструктури (за

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groups (according to the manifestation of the source of threat) are highlighted. Further prospective lines of research are indicated.

Keywords: cyberattacks, critical infrastructure, State security, threats to critical infrastructure facilities, transnational organized crime, transnational organized criminal groups.

проявом джерела загрози), пов'язані з діяльністю транснаціональних організованих злочинних угруповань. Визначено подальші перспективні напрямки досліджень.

Ключові слова: кібератаки, критична інфраструктура, державна безпека, загрози об'єктам критичної інфраструктури, транснаціональна організована злочинність, транснаціональні організовані злочинні угруповання.

Introduction

The modern legal policy of Ukraine in the field of combating crime is in a state of radical transformations and reforms, which are designed to ensure maximum observance of human rights and freedoms and bring Ukraine closer to the EU integration. However, due to objective and subjective miscalculations during the implementation of large-scale reforms, the war of the Russian Federation against Ukraine, tensions in the international political arena, a sharp increase in the threats of terrorist attacks, there is a significant intensification of criminal processes and acquisition of new systemic quality by crime. Nowadays, organized crime is becoming a significant factor in increasing social tension and destabilizing social relations in all spheres of life, hinders the recovery of the economy, and slows down the integration processes of Ukraine's entry into the world community. The transnational and, unfortunately, "universal" nature of criminalization of social relations requires including transnational organized crime in the signs of the global crisis of human society in the 21st century and in the list of global threats to international, national and regional security of mankind.

The analysis of available sources of information indicates that transnational organized criminal groups can control a significant part of the shadow economy, introduce new illegal financial schemes related to the legalization (laundering) of proceeds from crime, including financing terrorist activities of the Russian Federation, evading international sanctions, transferring costs to temporarily occupied territories of Ukraine, etc. The activities of transnational organized criminal groups are characterized by a high level of organization and intelligence, qualified personnel, using the latest technologies of covert communication, stable corruption and international ties, etc.

This problem is extremely urgent for our country since due to the full-scale invasion of the Russian Federation, the destruction of a significant part of industrial facilities, agricultural sector, transport and logistics infrastructure, closure of significant part of the sales markets for Ukrainian producers, as well as the blocking of transit to third countries, its critical infrastructure is in a difficult situation, which creates a favorable basis for the penetration of transnational criminal groups into State authorities of various levels, the national economy, politics and threatens the sustainable development of the State. This leads to constant threats to critical infrastructure facilities, which are integrated into social processes and acquire permanent character.

Therefore, the issue of eradicating and preventing such processes becomes a priority direction of state policy in the security sector, acquires extraordinary relevance in today's conditions and is the subject matter of close attention from law enforcement agencies, scientists and the public. The awareness of global threat to critical infrastructure posed by the activities of transnational organized crime groups, and the emergence of problems associated with the need to combat them, has necessitated the scientific understanding of this issue.

Consequently, the purpose of the study is to develop the concept of "threats to critical infrastructure facilities associated with the activities of transnational organized criminal groups", as well as to identify the most common threats to critical infrastructure facilities, the source of which may be the activities of transnational organized criminal groups.

To achieve this aim, the following tasks should be solved:

- 1) To consider certain aspects of the genesis and manifestation of this type of crime as a source of threat through the prism of ensuring State security;
- 2) To examine the concept of threat (within the issue of critical infrastructure sector) in the works by domestic scientists and the approaches to this term in some foreign countries (the US, Germany, the UK);
- 3) To investigate the approaches to the definition "threats to critical infrastructure facilities" enshrined in relevant legal instruments of Ukraine;
- 4) To learn scientific views on the classification of threats to critical infrastructure facilities and to propose the authors' classification according to the manifestation of the source of threat;
- 5) To formulate the concept of "threats to critical infrastructure facilities associated with the activities of transnational organized criminal groups";
- 6) To make respective conclusions and to outline future lines of research based on the results of the study.

Methodology

Scientific methods are the basis of any research, helping to ensure the objectivity and reliability of the results obtained. Each method has its own specifics, due to which we can study various aspects of the chosen topic in more depth. The chosen methods helped to structure the research process, determine the stages and order of tasks, ensure the reliability and authenticity of the results, which makes it possible to implement the research results into practical application and use them in real conditions.

The methodological basis for the research is a system of general and special scientific methods and approaches, ensuring the objectivity of the study and complete exploration of the subject matter of the work. Taking into account the specifics of the research topic, the following methods were used:

Historical method was used to investigate the genesis of transnational organized criminal groups formation and manifestation of this type of crime as a source of threat through the prism of ensuring State security.

Monographic, logical and dogmatic methods contributed to the examination of the concept of threat (within the issue of critical infrastructure sector) in the works by domestic scientists and the approaches to this term in some foreign countries (the US, Germany, the UK).

Comparative and legal method was chosen for the comparison of the approaches to critical infrastructure protection in leading European States (Germany, Poland, Slovakia, Israel).

The method of normative analyses, as well as interpreting method helped to investigate the approaches to the definition of "threats to critical infrastructure facilities" enshrined in relevant legal instruments of Ukraine.

System and structural and systemic methods were applied for considering scientific views on the classification of threats to critical infrastructure facilities and formulating the authors' classification according to the manifestation of the source of threat.

Legal modelling method made it possible to formulate the Authors' definition of "threats to critical infrastructure facilities associated with the activities of transnational organized criminal groups".

Prognostic as well as summarization methods were helpful when making respective conclusions, discussing the implications of the findings for theory and practice and suggesting future lines of research.

Limitations in the choice of scientific research methods are determined by the purpose of the research (to develop the concept of "threats to critical infrastructure facilities associated with the activities of transnational organized criminal groups", as well as to identify the most common threats to critical infrastructure facilities), the specificity of the object (activities of transnational organized criminal groups to the detriment of critical infrastructure facilities), available resources (available works by foreign and domestic scholars, current legal instruments on the issue under consideration, publicly available data bases), and scientific ethics (methods should avoid subjectivity, falsification, or manipulation of data).

Literature review

A number of foreign and domestic authors have dedicated their works to the issue of transnational organized crime. For example, J. Anderson Black (1992) examined this global phenomenon starting from emerging of Mafia in Sicily, Yakuza in Japan, Triads in China and Mafia in post-Soviet Russia. However, states the Author, nowadays organized crime has gone international, and North America, Europe, Australia, and Southeast Asia are suffering because of this terrible phenomenon.

According to Shelley (2005), whose view we completely support, transnational organized crime is not a homogeneous phenomenon given that its structural units can form and develop in different political and economic conditions. All these structures exploit weaknesses in national and international law enforcement systems, differences in the rules of banking, investment, criminal and other branches of law. At the same time, there is no form of government with permanent immunity to transnational organized crime in the modern world, as well as there is any political and legal system that would be able to exercise total control over its functioning, any financial or economic system that would be able to put an end to the illegal activities of transnational criminals.

Transnational forms of organized crime were considered by Williams (2001), who believes that transnational organized crime is a new factor in geopolitics with its own character and logic of development. The scientist emphasizes, first of all, the economic essence of the phenomenon, but also defines the political aspects of its functioning. He actually equates a part of powerful transnational criminal organizations with legal transnational corporations, whose only difference from transnational criminal organization is nature and forms of capital accumulation and circulation.

As for the modern Ukrainian doctrine, the problems of scientific development of transnational organized crime in the spheres of economic activity that may be related to the critical infrastructure activities, were considered in a number of works.

Bobro (2015) proposed to consider threats to critical infrastructure as existing and potentially possible phenomena and factors that pose a danger to the sustainable functioning of critical infrastructure facilities. He focuses on man-made accidents and technical failures, often caused by human error, natural disasters and malicious actions.

Biriukov et al. carried out (2015) a comprehensive analysis of threats related to accidents, dangerous natural phenomena and malicious actions. They emphasized the need for a systemic approach to protecting critical infrastructure, taking into account both traditional and new challenges.

Sukhodolia (2016) identified key threats to critical infrastructure, such as emergency situations (natural disasters and man-made accidents), terrorist acts, sabotage and cyber threats. He draws attention to their growing complexity and frequency, which emphasizes the need for an integrated approach to their prevention and minimization.

Herasyenko (2024) analyzed the threats to Ukraine's critical infrastructure. Having based on international and domestic experience, the scholar classified them into: physical assaults, cyberattacks, economic sabotage, terrorist actions, and assaults using climate weapons. He states that this classification allows for a more accurate risk assessment and the implementation of appropriate measures to protect national critical infrastructure facilities.

As Biriukov et al. (2015) correctly point out, the tense military and political situation, in which our state defends its own territorial integrity and sovereignty, is characterized by a significant increase in the level of such threats of malicious actions as the commission of terrorist acts and sabotage operations on the territory of our country, directed at critical infrastructure facilities. Clearly, the most serious is potential threat of using nuclear energy facilities for terrorist purposes. There is also significant increase in the intensity of cyberattacks on the information and telecommunications infrastructure in Ukraine. Cyberattacks via the Internet are experienced by servers of state institutions, large companies, financial institutions, political parties and the media, as well as the information and telecommunications infrastructure of military facilities.

It can be stated that the works of these scientists are of great importance for legal science in the field of transnational organized crime research. At the same time, it should be noted that until now neither a generally accepted understanding of threats to critical infrastructure facilities, including those related to the activities of transnational organized criminal groups, nor their place in the state security system has been clearly defined, which determined the relevance of our research.

Results and discussion

First of all, it is worth to refer to the genesis of transnational organized criminal groups formation and manifestation of this type of crime as a source of threat through the prism of ensuring State security, as it is the pre-condition for understanding the features and specifics of its functioning nowadays, i.e. on the territory of Ukraine.

Thus, in domestic criminology, it is traditional to believe that the roots of modern transnational organized crime in the economic sphere go back to Soviet times, when in the 1960s and 1980s, the unfavorable economic situation led to negative quantitative and qualitative changes in crime. The proportion of crimes in the economy increased, material damage from them increased in many times. Due to the relaxation of law enforcement control, there was the rise of large-scale thieves of socialist property; shady businessmen (traders) with corrupt representatives of the party and state apparatuses began to operate – and all of them had been criminally enabled to make a profit. In fact, in the last decades of the Soviet system, a powerful layer of economic criminality was created, which significantly grew and enriched during the period of restructuring and redistribution of property (Kornienko, 2004, p. 8).

Then, in the late 1980s and early 1990s, there was a process of first confrontation, and the merger of black economy traders with criminal groups of a traditional general criminal orientation. The active consolidation of criminal groups has gradually led to their establishment of control over entire branches of trade, production, transport, small, medium and large entrepreneurship, financial operations. Starting from the 90s, the spread of negative processes was facilitated by such factors as the imperfection of the domestic legal framework regulating relations in the sphere of economy and public administration, a large number of unemployed and low-income sections of the population that became a potential pool of human resources for various criminal (including organized) groups. Gradually, at the end of the first half of the 90s, organized criminal groups began to form on the basis of a kind of alliance representatives of the administrative and economic nomenclature, businessmen from the economy and criminality. Subsequently, this union acquired a permanent and systemic character (Burkal, 2019, p. 9).

With the collapse of the USSR, the previously unified legal space narrowed to the territory of individual new States. At the same time, the criminal space not only did not narrow, but also preserved its previously shared territory.

In the future, the processes of democratization of society, the fall of the “Iron Curtain”, the weakening of border control, the liberalization of foreign economic activity, became a catalyst for the integration of domestic organized crime into the world criminal community. Gradually, domestic organized crime began to acquire characteristics of transnational one. Other factors of the rapid spread of transnational organized crime in Ukraine were the crisis socio-political situation, the presence of significant gaps in criminal, criminal procedural, customs, and economic legislation, the lack of effective methodological developments on countering the new socially dangerous phenomenon, and an imperfect mechanism of interstate coordination.

Over time, organized criminal groups went far beyond the territory of the State, establishing ties both with criminal structures and with legally operating economic entities. Their material, technical and financial base was strengthened, professionalism, organization and interaction with similar structures abroad enhanced. The spread of transnational ties of organized criminal groups was also facilitated by the central geographical location of Ukraine, the longest border length in Europe (8,215 km), which, in combination with complex socio-economic processes both in our country and in neighboring States, led to the country falling into one of the epicenters of transnational criminal flows.

According to the researchers, the features of the internationalization of post-Soviet organized crime were: high rates of migration processes on the territory of the CIS; the powerful financial resources of post-Soviet crime, resulting from the unprecedented plunder of national wealth in the CIS countries, enabled it to carry

out extensive investment activities in different regions of the world; the integration of organized crime with political regimes in many CIS countries, which led to the transformation of the territory of the Commonwealth into a haven for criminal structures (Doroshenko, 2003, p. 20). In general, approximately by the mid of the 2000s, the activities of transnational organized criminal groups acquired a modern appearance, covering such areas of the economy as: credit and finance, banking, privatization, real estate, the stock market, virtual assets, foreign economic activity, and others (Sukhodolia, 2016).

At the current stage, the determining factors of forming threats to critical infrastructure facilities related to the activities of transnational organized criminal groups are globalization processes taking place in the world community, namely: development of international relations, creation of transnational corporations, simplification of procedures for crossing state borders, unification of international public organizations, introduction of international payment systems, etc. The UN report "The globalization of Crime: A transnational organized crime threat assessment" states that criminal organizations earn billions of dollars annually from trafficking in drugs, weapons, people, raw materials, counterfeit products, as well as maritime piracy and cybercrime, but this threat concerns not only the economy. Income from criminal activity and the threat of the use of force allow criminals to influence elections, politicians and the military, and the largest economies become vast markets for illicit goods (UNODC, 2010).

It is worth additionally noting that significant destabilizing factors in Ukraine related to the activities of transnational organized criminal groups are: criminalization of the sphere of economic relations (illegal transactions in external investment and credit channels, attempts to establish control over profitable entities of economic activity, transport and communication); illegal operations with financial resources (fraud, transfer of funds abroad using forged documents; legalizing, laundering proceeds of crime); fraud using ultra-new means of payment and computers, etc. No less important factors, in our opinion, are internal processes, in particular, instability of the government and political system, functioning of various oligarchic groups of influence, imperfection of the current legislation, constant reformation of law enforcement agencies, temporary occupation of part of the territory of Ukraine by the Russian Federation, etc.

Summing up, we can highlight the main internal and external factors shaping the threats to critical infrastructure facilities related to the activities of transnational organized crime groups, in particular:

Internal ones: unstable political situation; corruption vulnerability of the state apparatus, including the judicial branch of government; insufficient effectiveness of the law enforcement system; imperfection of the current legislation; slow pace of reform implementation; functioning of oligarchic groups of influence; low level of solvency of the population; large number of unemployed; low level of ensuring economic competition; monopoly-oriented economy;

External ones: war of the Russian Federation against Ukraine; temporary occupation of Ukrainian territories in the east and south of our country; intensification of intelligence-subversive, intelligence-sabotage, terrorist and other illegal attacks on critical infrastructure facilities using organized crime (including transnational one); formation of a global financial system, high speed of capital movement, ensuring international circulation proceeds from crime; development of a single global information network "Internet", leading to an increase in the number of computer crimes (criminals have gained the opportunity to interfere in trade and financial transactions, trade and financial transaction systems, hack accounts, credit card systems, etc.); integration of the transport and logical system, mobility of material and human resources; creation of offshore markets that are not taxed, which contributes to the export and legalization of criminal capital, etc.; different systems of criminalization and degree of responsibility; global financial crisis.

Having dealt with historical development of this phenomenon and evolution of external and internal factors shaping the threats to critical infrastructure facilities related to the activities of transnational organized crime groups, we turn to the basic concepts related to the subject matter of our research.

The modern explanatory dictionary of the Ukrainian language defines the term "threat" as the possibility, inevitability of danger (Busel, 2005). Yermoshenko & Horiacheva (2010), researching the problems of financial security of the State, states that a threat is a specific and immediate form of danger or a set of negative factors or conditions. Instead, Pekin (2007) offers a more extended definition of this concept as the most concrete and immediate form of danger, that is, an existing danger that is characterized by a specific form of manifestation by a means of influence or a set of conditions and factors creating danger to the interests of citizens, society and the State, as well as national values and the national way of life.

Hubsyki (2001) also refers to the features of danger as the factors that directly or in the future make it impossible or difficult to implement national economic interests, creating obstacles to the normal development of the economy, a danger to state independence and the well-being of the people.

In view of the above, it can be concluded that despite certain contradictions in the definition of the term “threat”, the researchers call the possibility of creating real or potential danger as its defining feature, which we agree with.

Under the “threat” in the context of critical infrastructure protection Bobro (2015, p. 92) suggests understanding “existing and potentially possible phenomena and factors creating danger to the sustainable functioning of critical infrastructure facilities and may lead to negative consequences”. We consider this definition quite objective, which may be confirmed by its almost identical wording in the Green Paper on a European programme for critical infrastructure protection, where this term means “any circumstances or events that may disrupt the sustainable functioning or destroy critical infrastructure or any of its element, as well as any attempts and intentions to harm critical assets” (Commission of the European Communities, 2005).

A similar standpoint is supported by Yermenchuk (2017), who believes that the threat to critical infrastructure facilities is “existing or potentially possible phenomena and factors that can harm such an object (physical or in cyberspace), render it inoperable or otherwise fail to function as intended what constitutes a danger to vital national interests of Ukraine”.

In the USA, the threats to critical infrastructure are understood as natural or man-made phenomena, natural persons, actors or actions containing or bearing potential harm to life, information, operations, the environment and/or property (Telenyk, 2018, p. 365). It is worth noting that the term “critical infrastructure” first appeared in the PDD-63 directive (Presidential Decision Directive) (The White House, 1998), which was signed by the US President Bill Clinton. The said Directive classified critical infrastructure as a national vital interest, defined goals and formed a concept for reducing its vulnerability in the public and private sectors. And most importantly, it established a requirement to ensure the security of critical infrastructure elements.

Subsequently, the issue of critical infrastructure and its security began to evolve in European countries, in particular, Germany, Great Britain, the Netherlands, the Czech Republic, Slovakia, Poland, Hungary, etc. In Europe, the problem of critical infrastructure protecting was first addressed in Great Britain, 1999, by defining its main and the responsibility of certain state bodies for its protection. National critical infrastructure was defined as systems whose continuity is important for the functioning of the state, the loss or disruption of which would or could endanger the lives of citizens, could have serious negative economic or social consequences for society or a large part of it. Such systems included state administration, reserve services, energy and fuel supply, water supply, telecommunications, food supply, sanitation, finance and economics, communication networks and services, justice and protection of public order, social services, education, science and testing, weather forecasting, etc.

According to the UK legislation, threats can range from terrorism to attempts by states to harm people in the UK and undermine their way of life. From the beginning of the construction of the critical infrastructure protection system in the UK, attention was primarily paid to the need to protect against threats in the field of state security. Therefore, the National Infrastructure Security Coordinating Center (NISCC) and the National Security Advisory Center (NSAC) had been cooperating for a long time. Subsequently, the Center for the Protection of National Infrastructure (CPNI) was formed on their basis, which provides comprehensive security advice to enterprises and organizations that are operators of critical infrastructure, including information, personnel and technical aspects of security, helping to reduce the vulnerability of national critical infrastructure to terrorism and other threats. Subsequently, the functions of countering threats in the field of computer security were transferred to the National Cyber Security Center (NCSC). Ensuring the resilience of the UK in dealing with the emergencies and the corresponding threats is the responsibility of the Contingencies Secretariat (CCS), which facilitates the work of the Center for Crisis Management (COBR), which ensures the rapid development of a common position and the implementation of coordinated response to existing threats (Yermenchuk, 2017).

Among the European countries, it is useful to highlight the active identification and analysis of threats to critical infrastructure carried out by Germany. According to the National Strategy for Critical Infrastructure

Protection (CIP Strategy) (Federal Ministry of the Interior, 2009), the concept of threat is defined as the possibility of events (natural phenomena, technical failures or human mistakes, errors in human behavior) that can cause damage to persons, material values and the environment or lead to the disruption of social and economic relations.

In 2007, Slovakia adopted its first document on critical infrastructure protection, which defines a general strategy for protecting vital objects, but does not have a detailed plan of action in crisis situations. Critical infrastructure is defined as that part of the national infrastructure (selected organizations and institutions, objects, systems, equipment, service systems), the destruction or limitation of which as a result of the influence of risk factors will endanger or disrupt the political and economic course of the state or will threaten life and health of the population. Defense infrastructure objects are also an integral part of critical one. In 2011, the Law on Critical Infrastructure of the Slovak Republic, which clearly defines the critical infrastructure objects, the state bodies responsible for their protection, as well as a detailed plan of measures in case of an emergency, was adopted. This Law defines that critical infrastructure consists of elements, whose disruption or destruction would have serious adverse consequences for the performance of the economic and social functions of the state and, consequently, the quality of life, protection of life, health, safety, property and the environment. We can generalize that critical infrastructure includes physical objects, resources, services and information and communication technologies, networks and other infrastructure assets which, if disrupted or destroyed, would have serious consequences for the health, safety or economic well-being of citizens or the effective functioning of the State (Act No. 45/2011, 2011).

In Poland, critical infrastructure is defined as functionally interconnected means of production, institutions, and services that are key to the security of the country and its citizens in ensuring the proper functioning of both state and self-government bodies and institutions, and the commercial (private) sector. In 2007, the Polish government adopted the law on crisis management, within the framework of which a clear understanding of the parameters of critical infrastructure and their protection is presented (Law of Crisis Management, 2007).

In Israel, experts define infrastructure as critical if its disruption may lead to significant socio-economic shocks that are able to undermine stability in society and thereby lead to the threats to the country's national security. It is well known that the security system for airport terminals (one of the vulnerable critical infrastructure items) developed in Israel is nowadays the most effective one in the world (Hriniaiev, 2012).

At the same time, it should be noted that there is no legal definition of the concept of “threat to critical infrastructure facilities” in Ukraine, as well as there is any general approach to their classification. The Law of Ukraine “On the National Security of Ukraine” (Law No. 2469-VIII, 2018) provides the following definition of threats in the context of ensuring national security – these are phenomena, trends and factors that make impossible or complicate the realization of national interests and the preservation of national values of Ukraine.

The Decree of the President of Ukraine “On the National Security Strategy of Ukraine” (Decree No. 392/2020, 2020) defines current and projected threats to the national security and national interests of Ukraine, taking into account foreign policy and internal conditions. Having analyzed the provisions of the Decree, the following can be attributed to threats to critical infrastructure facilities in the context of countering transnational organized criminal groups:

- The modern model of globalization has enabled the spread of international crime, in particular in the legalizing (laundering) proceeds of crime;
- The inconsistency and incompleteness of reforms, as well as corruption hinder the recovery of the Ukrainian economy, make its sustainable and dynamic growth impossible, increase vulnerability to threats, and fuel the criminal environment;
- Insufficient protection of property rights, slow development of market relations in key areas, including the use of land and subsoil, significant role of the public sector in the economy, imperfection and fragmentation of legislation restrain economic growth, attraction of domestic and foreign investments;
- Insufficient level of competition and dominance of monopolies, in particular in the energy sector and infrastructure, low energy efficiency reduce Ukraine’s competitiveness, threaten the well-being of its citizens;
- The threats to critical infrastructure, related to the deterioration of its technical condition, the lack of investment in its renewal and development, unauthorized interference in its functioning (in particular,

physical and cyber), ongoing hostilities, as well as the temporary occupation of part of the territory of Ukraine, are constantly increasing.

It should be noted that any of the current and foreseeable threats defined by the Decree may have a direct or indirect impact on critical infrastructure facilities, and by their very nature to be considered a threat. At the same time, in this context, we in this context we have been based on the purely economic categories and their direct relation to critical infrastructure functioning.

The Strategy for Ensuring State Security also states that the threats to critical infrastructure related to the temporary occupation of a part of the territory of Ukraine, ongoing hybrid influences by the entities of intelligence-subversive activities, the deterioration of the technical condition of such infrastructure, and attempts to illegally interfere with its functioning, including physical and, in particular physical and cyber ones, are increasing (Decree No. 56/2022, 2022).

Interesting in terms of the problem under consideration is the Decree of the President of Ukraine “On the Strategy of Economic Security of Ukraine for the period up to 2025” (Decree No. 347/2021, 2021), which defines challenges and threats in the spheres of financial, production, foreign trade, investment and innovation, macroeconomic security. Having studied the provisions of this Decree, the following can be attributed to threats to critical infrastructure, which are in one or another way related to the activities of transnational organized criminal groups:

- High level of “shading” economy;
- Loss of budget revenues due to widespread phenomena of “grey” imports and smuggling, tax evasion schemes, tax base erosion through the use of “low-tax” jurisdictions;
- Inconsistency of legal regulation of relations in the tax sphere;
- The spread of the phenomenon of legalizing (laundering) proceeds of crime;
- Unsatisfactory technical condition and level of protection of critical infrastructure facilities, insufficient investment in its renewal and development, potential threat of unauthorized physical and cyber interventions in its functioning;
- Lack of favorable conditions for attracting investment and reinvestment, as well as insufficient institutional support for these processes;
- Insufficient level of protection of intellectual property rights;
- Illegal directions to domestic technological developments and innovations by foreign entities and the risks of their unauthorized leakage abroad;
- Low protection of property rights;
- Corruption.

Current legislation does not classify threats to critical infrastructure facilities either by criteria or spheres. In contrast, a number of criteria for the classification of threats in various spheres of life have been proposed in the scientific literature. The most widespread is location-based separation of threats into internal and external in relation to the security object. Accordingly, external threats arise in the object’s external environment, while internal threats are determined by the state of the security object itself.

The classification and division of threats into real and potential ones is of great importance in the system of security sciences. Such a division is carried out according to the probability, by the risk level of conditions under which danger occurs. In case of potential threat, there is a possibility of some harm (damage), but its scale does not constitute danger. In the case of a real threat, significant harm (damage) is caused. If the potential threat must be prevented in order to avoid its negative impact, then a real threat requires an immediate response from state authorities in the form of specific measures to directly counter the threat to minimize its destructive impact on security and prevent it from turning into a real danger (Pyrozhenko, 2006, p. 25). In our opinion, the thesis “in the case of real threat, the harm is caused” is quite debatable, since harm can be inflicted only when the threat is implemented, that is, specific acts (actions or omission) aimed precisely at achieving the specified result.

There are also other classifications of threats in the scientific literature. Thus, by the degree of danger, it is customary to divide threats into particularly dangerous (with a maximum level of impact), dangerous (with an average level of impact) and potentially dangerous (with a minimum level of impact). Depending on the specifics of the occurrence of threats, they are divided by the suddenness and frequency of occurrence, as well as by the time of manifestation. According to the duration of the destructive impact, threats are

classified into systemic and additionally acquired. By the mechanism of influence, threats are divided into direct and indirect. According to the possibility of influence on threats and the sources of their occurrence, they are divided into controlled, which are influenced, and unmanaged, which are not influenced by the public authorities (Khylyko, 2004).

As for threats to critical infrastructure facilities, it is proposed to divide them into three groups, which include accidents and technical failures, natural disasters and dangerous natural phenomena, malicious actions (by groups or individuals, such as terrorists, criminals and saboteurs, industrial espionage, as well as hostilities). Especially dangerous are combined threats and threats, the implementation of which can lead to disastrous and varied cascade effects due to the interdependence of critical infrastructure elements.

Threats from physical impact from the inside and outside of critical infrastructure facilities, threats arising from human miscalculations and technical failures, terrorism or criminal acts are also distinguished. An example of a threat from the inside of a facility is a so-called «intentional error», for example, the intentional incorrect programming of control systems, which leads to accidents or production stoppages, interference with important parts of the plant using the auxiliary means and tools available at any enterprise. External threats may include a vehicle accident, arson, use of explosives, shelling, plane crash, use of chemical, biological, radiological or nuclear weapons. Criminals can also apply combined actions (Yermenchuk, 2018).

As for the subject matter of our scientific research, the classifier of threats to critical infrastructure facilities is the manifestation of the source of threat, to which we refer for transnational activities organized criminal groups. We highlight the following threats to critical infrastructure facilities related to the activities of transnational organized criminal groups according to the criteria of manifestation of the source of threat:

- Introduction and implementation of illegal schemes and mechanisms in the course of privatization, public procurement, management of state corporate rights, bankruptcy of state enterprises, VAT administration, other operations affecting the operation of critical infrastructure facilities;
- Using administrative, financial and other resources of critical infrastructure facilities in the war of the Russian Federation against Ukraine;
- Corruption links in the authorities and administrations, facilitating the implementation of criminal schemes;
- Obtaining advantages in the field of public procurement, state benefits and other economically unjustifiable preferences by criminal entities at the expense of critical infrastructure facilities;
- Acquisition of Ukrainian intellectual property facilities, information containing commercial secrets and their use in the illegal activities to the detriment of critical infrastructure facilities;
- Receiving and using restricted information circulating on critical infrastructure facilities for criminal purposes;
- Lobbying for the adoption of legal acts for private purposes at the expense of critical infrastructure facilities;
- Transfer of capital, obtained as a result of activities to the detriment of critical infrastructure facilities abroad with the aim of tax evasion and legalization of criminal property in favorable jurisdictions;
- Reducing the investment attractiveness of critical infrastructure facilities and violation of healthy competition against them due to the application of «unfair» rules;
- Development and implementation of cyber disruptions to the detriment of critical infrastructure facilities by criminal entities;
- Containment of development in critical infrastructure sectors, non-improvement of legislation in the field of critical infrastructure protection.

This classification (according to the manifestation of the source of threat), in our opinion, allows solving a number of problems in the national system of critical infrastructure protection, namely:

- 1) Identifying any actor, phenomenon, event, process or set of conditions as a threat to critical infrastructure facilities, as well as classify it by characteristics, which allows planning, developing and implementing a set of measures to ensure effective functioning of critical infrastructure systems;
- 2) Involves the use in the formation and clarification of the main goals and objectives in the field of operation and protection of critical infrastructure;

- 3) To be used in forecasting strategic directions of critical infrastructure supply, as it provides for the possibility of grouping threats according to the degree of danger as a result of a quantitative assessment of the level of negative impact on the provision of basic services in the event of destruction, damage or malfunctioning of critical infrastructure facilities;
- 4) Enables to abandon the traditional inclusion of a rather hypothetical list of threats to critical infrastructure facilities in national security regulations, without drawing a line between them on the essential signs of the origin and nature of the influence.

The presented threats to critical infrastructure facilities related to the activities of transnational organized criminal groups are not exhaustive – they depend on many subjective and objective factors, evolve and degrade due to the changes in social relations.

Summing up, we can conclude that the results of the study enabled to formulate a definition of the concept of “threats to critical infrastructure facilities related to the activities of transnational organized criminal groups”, as well as to define such them. Thus, we interpret this term as existing and potentially possible phenomena and factors arising in the process of activities of transnational organized criminal groups and are capable of hindering the stable operation of critical infrastructure facilities, lead to damage both to the object itself and to the State as a whole.

Conclusions

Summing up, we can conclude that the results of the study enabled to formulate a definition of the concept of “threats to critical infrastructure facilities related to the activities of transnational organized criminal groups”, as well as to define such them. Thus, we interpret this term as existing and potentially possible phenomena and factors arising in the process of activities of transnational organized criminal groups and are capable of hindering the stable operation of critical infrastructure facilities, lead to damage both to the object itself and to the State as a whole.

The presented threats to critical infrastructure facilities related to the activities of transnational organized criminal groups (according to the manifestation of the source of threat) are not exhaustive – they depend on many subjective and objective factors, evolve and degrade due to the changes in social relations. It should be noted that in the modern conditions of the globalized world, organized crime of a transnational nature threatens not only the critical infrastructure of individual states, but also the international legal order in general, therefore the development and implementation of effective measures to counter this socially dangerous phenomenon should be declared as a priority direction of each country policy.

In our opinion, the proposed concepts and types of threats to critical infrastructure facilities, the source of which may be the activities of transnational organized criminal groups, will significantly contribute to:

- Orienting law enforcement to counteract the most significant threats to critical infrastructure facilities, without being distracted by minor ones;
- Clear understanding of the essence of the identified threats to critical infrastructure facilities, methods for their identification and elimination;
- Organizing large amounts of information on the activities of transnational organized criminal groups to the detriment of critical infrastructure facilities;
- Optimizing law enforcement activities through economy and rational deployment of forces and means;
- Identifying gaps and conflicts of laws, as well as the reasons and conditions contributing to the illegal activities of transnational organized criminal groups to the detriment of critical infrastructure facilities;
- Mastering techniques and methods of countering the activities of transnational organized crime groups to the detriment of critical infrastructure facilities.

Further prospective lines of research may include the study of threats to critical infrastructure facilities related to the activities of transnational organized crime groups in individual sectors of critical infrastructure, in particular: fuel and energy, food industry and agro-industrial complex, capital markets and organized commodity markets, finance, etc.

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Innovative aspect of modernization of higher education teaching staff

Інноваційний аспект модернізації педагогічного персоналу вищої школи

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Abstract

The article clarifies the essential features of innovation, classification, integral qualities of innovation; factors of innovative learning technologies, and modern innovative learning models. New innovative learning technologies in the modernization of training of specialists in the educational process are defined as distance, blended, and mobile learning. The study's ascertaining stage showed that students' readiness to implement innovative technologies is insufficient, which confirmed the study's relevance in the modernization of professional training of specialists and the role of innovative learning technologies. Based on the generalization

Анотація

У статті з'ясовано сутнісні ознаки інновації, класифікацію, інтегральні якості інновацій, ключові характеристики інноваційних технологій навчання при модернізації професійної підготовки фахівців в освітньому процесі вищої школи. Новими інноваційними технологіями навчання при модернізації професійної підготовки фахівців в освітньому процесі вищої школи визначено дистанційне, змішане та мобільне навчання. Констатувальний етап дослідження показав, що на недостатньому рівні перебуває готовність студентів до впровадження інноваційних технологій, що й підтвердило актуальність дослідження щодо

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of the results of the formative stage of experimental training, it was confirmed that the proposed special course of the specified training is statistically justified and effective, the level of readiness of EG students is higher than that of CG students. Methodological recommendations have been developed for the use of innovative technologies in the modernization of the professional training of specialists and their further application in the professional activities of specialists.

Keywords: innovative learning technologies, modernization of professional training of specialists in higher education, remote laboratories, virtual reality, wireless mobile communication technologies, multimedia information resources.

модернізації професійної підготовки фахівців в освітньому процесі вищої школи та ролі інноваційних технологій навчання. На основі узагальнення результатів формувального етапу експериментального навчання підтверджено, що запропонований спецкурс означеної підготовки є статистично обґрунтованим і ефективним, рівень готовності студентів ЕГ вищий, чим у студентів КГ. Розроблено методичні рекомендації до застосування інноваційних технологій навчання при модернізації професійної підготовки фахівців та подальшому їх застосуванні у фаховій діяльності спеціалістів.

Ключові слова: інноваційні технології навчання, модернізація професійної підготовки фахівців у вищій школі, віддалені лабораторії, віртуальна реальність, бездротові мобільні комунікаційні технології, мультимедійні інформаційні ресурси.

Introduction

The key tasks of education in the 21st century are the development of scientific and innovative activity, and the formation of a personality's thinking focused on creativity and innovation.

In the context of an innovative strategy of a holistic pedagogical process, the role of the management of a higher educational institution, teachers, and methodologists as direct carriers of innovative approaches is significantly increasing. With all the variety of learning technologies: didactic, computer, problem-based, modular-developmental, credit-modular, and others, the implementation of leading pedagogical functions remain with the teacher. The teacher-innovator is the carrier of specific innovations, their creator, and modifier. He has broad opportunities and an unlimited field of activity since in practice he is convinced of the effectiveness of existing technologies and teaching methods and can correct them, conduct research, and develop new methods and technologies. The main condition for such an activity is the innovative potential of the teacher.

With the introduction of modern technologies into the educational process, the teacher increasingly acquires the functions of a consultant, advisor, and mentor. The latter requires special psychological and pedagogical training from him, since in the professional activity of the teacher not only special subject knowledge is implemented, but also modern knowledge in the field of pedagogy and psychology, acmeology, the technology of teaching, and upbringing. On this basis, readiness for the perception, evaluation, and implementation of pedagogical innovations is formed (Dubaseniuk, 2009).

The need for an innovative orientation of pedagogical activity at the present stage of development of education and society as a whole is due to several circumstances.

Firstly, socio-economic transformations and scientific and technical processes determine the need for a radical renewal of the system of higher education, methodology, and technology of organizing the educational process in higher educational institutions. The innovative orientation of the activities of teachers and students involves the creation, development, and use of pedagogical innovations, and acts as a means of updating educational policy.

Secondly, the strengthening of the humanization of the content of education, continuous changes in the volume, and composition of academic disciplines, and the introduction of new specialties, new subjects, and elective courses require a constant search for new organizational forms and teaching technologies. In this regard, the role and importance of the teacher as a generator of pedagogical ideas is growing.

Thirdly, the change in the attitude of teachers to the very fact of mastering and application of pedagogical innovations. The innovative activity was mainly reduced to the use of innovations recommended above. Now innovative activity is becoming increasingly selective and research character. The degree of freedom of the teacher, who previously operated in strictly regulated conditions, is increasing.

Fourthly, the entry of universities into market relations, and the emergence of new types of non-state educational institutions of various forms of ownership, creates a real situation of their competitiveness (Rebukha, 2022).

At the same time, there is a spontaneity in the processes of creating and implementing innovations, the lack of a clear target orientation of innovations, the inconsistency of innovative searches carried out in the theory and practice of educational activities in higher education, the inconsistency of individual innovations with each other, the weakness of developing an innovative strategy for the development of higher education.

Regarding the areas of application of innovations, the majority of teachers (53%) believe that e-learning is advisable to use when studying almost any subject. The opinions of teachers who believe that students lack computer (29%) and communication (21%) skills are almost equally divided. Therefore, we consider it appropriate to consider the Innovative Aspect of Modernizing the Teaching Staff of Higher Education (Shuliak et al., 2022).

The development of innovative technologies in the high-quality training of future specialists is currently a relevant issue of the theory and methodology of teaching in the educational process. Based on this, we considered the following issues in the article: essential features of innovation, integral qualities, classification of innovations, and key characteristics of innovative teaching technologies in the modernization of professional training of specialists; factors of innovative learning technologies and modern innovative learning models; new innovative learning technologies for the modernization of professional training of specialists in the educational process of higher education – distance, blended, and mobile learning.

Literature Review

The scientific literature actively and fruitfully examines the problems of creating and using innovations in higher education, analyzes the conditions for their effective functioning, and develops methods for teaching teachers and students to design innovative pedagogical technologies. The widespread introduction of innovative teaching technologies in higher education has led to the emergence of several scientific studies devoted to this topic.

Theoretical analysis of the problem indicates a wide range of scientific explorations, the results of which serve as a basis for further research. The conceptual foundations of innovative educational processes are considered in the socio-philosophical context of civilizational changes, substantiation of a new paradigm of education, and search for ways to overcome its crisis state. The analysis of the articles of scientists shows that O. Kokhan, O. Magden, & N. Mykhailova (2024) innovative technologies and modern information methods and emphasized the importance of individualized learning programs for effective communication between teachers and students in the educational space, which should be used in the educational process. L. Kotendzhy, I. Deka, & S. Boichenko (2023) considered in the article the professional training of future physical education specialists was linked with the modernization of the entire education system using innovative technologies, showed the importance of ensuring social adaptation to the constant changing living conditions of education seekers, identified the task of targeted development of a specialist, involving him in active ways of mastering cultural experience and social experience, proved the importance of using modern technologies and interactive teaching methods during the modernization of the training of physical education specialists, gave examples of innovative models that contribute to improving the quality of specialist training.

Scientists attach special importance to design in the organization of innovative educational processes as an integral method of cognitive, research, and design activities, the main way of combining pedagogical theory and practice. The features of training specialists are considered in the article by I. Pidlypnik (2022). To improve the pedagogical tools and form the content of professional training of specialists, the possibilities of training educators to use innovative technologies are analyzed. The directions for improving the content of training a future teacher to implement modern technologies in the workplace are outlined. He lights up

the features of implementing innovations; modern trends in training future specialists for pedagogical innovation in practice and theory are identified; the requirements for teachers in the context of implementing educational innovations are outlined, the leading role of new technologies in professional training is proven, and the feasibility of their use by future specialists is shown.

Researchers of socio-cultural and socio-psychological aspects of innovations focus on the analysis of personal characteristics of subjects of innovative activity, the peculiarities of the perception and dissemination of innovations, and the formation of an innovative thinking style. Kh. Bakhtiyarov, A. Aristov & S. Volobuyev (2017) justify the features of the technological approach to education; highlighted in the light of modern concepts of pedagogical theory and practice; creative technologies of learning and teaching are considered. The great importance of the role of innovations in the modernization of professional training of specialists is attached by scientists in monographs and manuals. Thus, L. Rebukha (2022), in the monograph, revealed the methodological principles of innovative learning technologies, showed the development of educational technologies and their theoretical aspects, and considered foreign experience in the development of innovations. In the conditions of digitalization, the authors of the monograph showed the theoretical and methodological practicalities of designing the educational process. An analysis of innovative learning technologies in the education system was made (interactive learning technologies, technologies for forming a creative personality, technologies for a personally oriented educational process, media technologies, and distance learning technologies).

Numerous studies are devoted to the formation of future teachers' readiness for innovative activity during their studies at higher pedagogical educational institutions, as well as the development of innovative competence of teachers in the conditions of postgraduate pedagogical education and in the process of professional, methodological, and self-educational activities. O. Maksymova & M. Fedorova (2022) presented scientific works in the collection that highlight research on the topic of introducing innovations in the modernization of professional training of specialists in the educational process, which cover technologies for implementing an environmental approach in the educational process, the main aspects of education: innovations in methodological support and quality management of the educational process, practice and methodology for implementing modern concepts, student development programs, innovative models and practices of education, training future specialists for innovative activities.

It should be noted that foreign researchers prefer to develop practical aspects of innovation processes.

Research by scientists: C. Ricardo-Barreto, D. Jabba Molinares, H. Llinás, etc. (2020) aimed at recognizing and analyzing the trends of ICT use (hardware, software, and digital educational resources) by higher education professors in the Antioquia region (Colombia), and characterizing this population according to their context. A. Manciaracina (2020) investigates the opportunities offered by an instructional tool, built to help teachers in the creation of hybrid teaching activities in post-pandemic learning contexts. Teachers will design new hybrid contexts by connecting physical space, digital space, innovative pedagogical approaches, and user needs. The starting points are the technical skills acquired by teachers during the period of forced distance learning, the new role of directors and designers of teaching activities assumed by teachers in active learning approaches, and the need for new innovative learning environments able to relate the human and technological components.

Research by O. Pons-Valladares, S. Hosseini & J. Franquesa (2022) is based on developing a new approach that combines several methods (strengths, weaknesses, opportunities, and threats (SWOT); multi-criteria decision-making; Delphi; and the Knapsack problem) and draws from teachers' experience, a panel of experts' expertise, the revised Bloom Taxonomy and neuroscience for education.

However, despite the presence of diverse scientific achievements on the issues of training social workers in the educational environment of a higher education institution, we must state that the theoretical and methodological principles of training social workers in the innovative educational environment of a university have not yet been the subject of special scientific research.

The methodology and concept of training future social workers in the conditions of the innovative educational environment of a university need to be substantiated. The issues of modeling the comprehensive scientific and methodological support for training social workers for professional activity have not been sufficiently studied. In addition, in the practice of training social workers, the resource capabilities of classroom and extracurricular educational and social and educational activities are not fully used.

Analysis of scientific sources, the current state of training specialists for innovative activities indicates the presence of contradictions between:

- Public demand for solving the problem of training specialists capable of implementing innovations in the provision of social services to the population, and insufficient development of the theoretical and methodological foundations of this problem;
- The expediency of creating an innovative educational environment in higher education institutions in the context of training future social workers and the lack of comprehensive scientific and methodological support for this process;
- The need to update the potential opportunities of the university's educational environment and the lack of involvement of teachers in innovative activities;
- The growing role of stakeholders and social partners of the university and the low effectiveness of cooperation with them on the part of the academic community of universities.

The objective need to solve the specified problem, its insufficient theoretical and practical development, and the need to overcome the specified contradictions determined the choice of the topic of the article.

Research purpose: to prove the invaluable role of innovative learning technologies in the modernization of professional training of specialists in the educational process of higher education and to suggest ways to increase the readiness of future specialists to apply and design innovative learning technologies in professional activities.

Methodology

Within the framework of the presented general understanding of the methodology and its highlighted structural components, revealing the essence of the methodology of activity in the pedagogical sphere, we note that important components of the system of methodological knowledge are: a set of principles of pedagogical activity and methods of pedagogical activity, which gives rise to the emergence of teaching methods, research methods, diagnostic methods, methods of managing a certain process, methods of using innovative technologies.

To realize the goal of the study, the next mutually conditioned *research methods* were used: theoretical – study, organization, comparison of scientists' views on the theoretical and practical aspects of the problem under study, and examination of psychological and pedagogical, scientific, philosophical works to determine the subject of the study, the purpose of the study and the classification of technologies; empirical – observations, questionnaires to diagnose the level of readiness of specialists to implement innovative technologies in specialized activities during the modernization of professional training of specialists, qualitative and quantitative analysis of empirical data; methods of mathematical statistics – to verify the reliability of the results of the experiment, evaluate empirical data.

When determining the sample of subjects, the general specificity of the research subject was taken into account. The total sample size was 110 people at the ascertaining stage of the study and 130 people at the formative stage of the study: the control group (CG) – 60 respondents, the experimental group (EG) – 70 respondents, as well as higher education teachers (40 respondents). When forming the sample, the criteria of content, representativeness, and equivalence were taken into account. The sample was formed by random selection using the technical procedure of calculating the selection step.

The reliability and validity of the obtained results, and the objectivity of their assessment were ensured by the methodological soundness of the initial positions and the qualimetric mechanism for assessing the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

To assess the homogeneity of experimental and control data collection, statistical processing was carried out using MS Excel and SPSS (Statistical Package for Social Science) programs.

In the study, we used quantitative methods to study a large group of people and subsequently analyzed the data obtained using statistical methods.

We showed a pilot survey of teachers of higher education organizations to control their state of readiness for the design and use of innovative education technologies in the modernization of training of specialists in educational development.

According to the results, it was found that teachers consider it necessary to use innovative education skills in the modernization of professional training of specialists to increase the efficiency of learning. There are 99% of such teachers.

The main obstacle to the request for innovative education technologies in the modernization of professional training of specialists in higher education by teachers was identified.

The task of the ascertaining stage was to study the current state of readiness of future specialists to apply and design innovative learning technologies in professional activities.

The readiness of future specialists to apply and design innovative learning technologies in professional actions is a dynamic component that is subject to diagnosis at different stages of university training. Therefore, three levels have been established: high – constructive, sufficient – reproductive, and low – initial. By the readiness structure, the criteria for determining levels and indicators are substantiated: motivational, cognitive, activity, and evaluation, which ensure the consistent formation of a systematic and holistic understanding of students about the feasibility and relevance of professional, innovative activity in the workplace.

According to the traditional methodology of modern universities, the overall indicator of the success of professional training of specialists in the didactic process for the specified activity was in the range from 1.97 to 1.96, which proves its low effectiveness (training is considered effective if $k \geq 2.7$). Thus, the ascertaining stage of the study showed that the readiness of students to implement innovative technologies is at an insufficient level, which confirmed the importance of the training on the innovation of professional training of specialists in the educational process and the role of innovative learning technologies.

The study included several stages:

In the first preparatory stage, the logic of the proposed structuring of the activities of the experimental groups provided for the intensification of students' independent, innovative search adjustment of the content of professional disciplines from the cycle of practical and professional training of students with topics of an innovative direction.

In the second – practical stage – the training of the special course “The Role of Innovative Teaching Technologies in the Modernization of Professional Training of Specialists in the Educational Process of Higher Education” was introduced into the process of training specialists. New innovative teaching technologies in the modernization of professional specialists training were introduced into the educational process of the EG.

At the third – experimental stage – the EG supplemented innovative material for pedagogical practice for students, where the list of tasks contributed to ensuring an increase in the level of readiness of pupils to practice advanced technologies. At this stage, after completing the formative stage of the study, the success of the introduced new innovative teaching technologies in the modernization of professional training of specialists was substantiated by comparing the results in the control and experimental groups.

To identify differences between the two groups – EG and CG, a comparison of the results of the survey of respondents was conducted. The results of the formative stage of the analysis of the obtained student results indicate that significant positive changes were experienced by the indicators according to all criteria – in EG respondents at the end of the experiment, we observed a significant increase in the indicators of the level of readiness of EG students to apply innovative teaching technologies in the modernization of professional training of specialists in the educational process of higher education:

These differences at the level of statistical significance are manifested in the level of preparation for the application of innovative teaching technologies in the modernization of professional training of specialists in the educational process of higher education based on the proposed special course “The role of innovative

teaching technologies in the modernization of professional training of specialists in the educational process of higher education" and the developed methodology.

A check (Kolmogorov-Smirnov criterion) was carried out for the equivalence of the samples using the data obtained. It should be noted that the two empirical distributions did not differ ($\lambda_{emp}=0.16 < \lambda_{cr}=1.36$) at the beginning of the formative stage, which allowed conducting a pedagogical experiment with selected students.

Based on the generalization of the results of experimental training, we note that a comparative analysis of students' responses within the framework of their professional training at the university indicated the dynamics of students' readiness levels for the application of innovative teaching technologies in the modernization of professional training of specialists and further professional activity.

The dynamic growth of the number of EG respondents who showed a high percentage of mastering the methodology of applying innovative technologies at a sufficient and high level indicates that the proposed special course of the specified training is statistically justified and effective, which was found out using the χ^2 – Pearson criterion: for all components (at $p \leq 0.01$) the level of readiness of EG students is higher than that of CG students.

Grounded on the consequences of the generalization and analysis of the results of the experimental work, we conclude that the level of preparation for the application of innovative teaching technologies in the modernization of professional training of specialists in the educational process of higher education based on a special course ensures the achievement of expected results, which is important in the further professional activity of specialists. Therefore, we have developed methodological recommendations for the application of innovative teaching technologies in the modernization of professional training of specialists and their further application in the specialized activity of experts.

Results and Discussion

1. Essential features of innovation, integral qualities, classification of innovations, and key characteristics of innovative teaching technologies in the modernization of professional training of specialists.

Innovations in education are a natural, dynamic, developing, and significant phenomenon in nature and results.

The ability to swell the innovative ground of the didactic situation in an educational institution and effect the general level of specialized action of a future professional is an essential feature of innovation.

Innovation, as a general modern education, is considered by essential abilities: advanced activity, innovative development, innovative atmosphere, and innovative probability. So, innovations in education are the dissemination and introduction of new tools, ideas, managerial and pedagogical technologies into educational practice, the process of creating something new in education, as a result of which the education system transitions to a qualitatively different state, the levels of successes of the organizational mechanisms of education growth (Leleka et al., 2022).

Innovations are classified by the thing of effect (organizational and managerial, pedagogical, socio-psychological), by level of distribution (local-technological, systemic-methodological), and by the innovative potential of the new (combinatorial, modification, radical).

Innovative learning technologies that are improved to the new socio-cultural atmosphere when modernizing the professional training of specialists are aimed at improving the organization of education, content, forms, and methods of the educational process. Innovative learning technologies have a dual focus: they provide for changes in the system of pedagogical training of specialists; they are a necessity income into reason for the deviations taking place in higher education (Dubaseniuk, 2009).

The key characteristics of innovative learning technologies are:

- *Systematicity* – has such features of a system as integrity, process logic, and the interconnection of all elements of the educational process;
- *Conceptuality* – each innovative learning technology is based on a certain scientific concept;
- *Efficiency* – is cost-effective, effective in terms of results, and guarantees the achievement of high-quality learning outcomes;
- *Manageability* – provides for the possibility of planning, goal-setting, designing the educational process, and varying methods and tools to correct the results of phased diagnostics;
- *Adjustability* – provides for the correction of errors, solving set tasks, creatively searching for optimal ways, and preparing for the further application of technologies;
- *Reproducibility* of innovative learning technology by other teachers in other higher educational institutions (Drozich et al., 2023).

Thus, modern pedagogical innovative learning technology is a synthesis of the combination of traditional elements of the experience of mankind, achievements of practice, and pedagogical science and innovations generated by the processes of humanization, social progress, and democratization of society.

2. Factors of innovative learning technologies and modern innovative learning models.

The factors of innovative technologies of education in higher education are:

- New pedagogical thinking of students, social transformations;
- Scientific-pedagogical, psychological approach to education, social sciences;
- Advanced pedagogical experience;
- The experience of the past, foreign and domestic experience;
- Ethnopedagogy, folk pedagogy.

New innovative technologies of education in the modernization of professional training of specialists in the educational process of higher education not only create favorable conditions for student creativity but also put forward new requirements for the teacher, who must:

- Deeply and innovatively master the subject;
- Diagnose the goals of education, personal development, and upbringing;
- Freely master active methods of problem-based developmental education;
- Holistically predict and determine the structure of the educational process;
- Model the professional activity of the future specialist under the conditions of professional training;
- Organize self-educational and independent work of students to prepare them for seminars, lectures, practical classes, and laboratory classes;
- Create rational visualization – fundamentally new types of visual aids;
- Know and be able to differentiate individual classes, group work using computers, etc.;
- Develop structural and logical schemes and supporting notes for the effective construction of lectures (Balalaieva et al., 2023).

Interactive technology is a modern, innovative learning model that implements a new type of pedagogical communication, which is an innovative educational interaction between students and teachers. With this approach, the educational process is considered an innovatively organized, managed, and joint interaction of students in mastering professional and life competencies, which is characterized by objectivity, motivation, and purposefulness and occurs in various forms. The interaction of students and teachers, primarily students among themselves, is the core of interactive technology. This is learning in interaction and cooperation, co-learning, where both the student and the teacher are active subjects of learning (Shetelya et al., 2023).

Interactive technology fundamentally changes the scheme of relations between participants, most closely corresponds to the personally oriented approach, and provides space in learning for students' self-realization.

Let us highlight the characteristic features of interactive learning technologies:

- Construction of the educational process as a series of interconnected problem situations;
- Cooperation of different levels (teacher-student, teacher-group, student-student, student-group);
- Quick feedback – the student can consult at any moment of learning and see the teacher's reaction;
- Reliance on student experience;
- Mainly group work of students in pairs;
- Openness of learning, lack of a specific solution;
- The main element of learning is dialogue;
- Relaxation and emotional upliftment of members in the didactic process (Bakhtiyarov et al., 2017).

Important areas of implementation of innovative technologies are: the formation of educational and, informational, and subject-oriented environments that ensure the development of resources of communication – television, telephone, satellite communication, computer network, for information argument; provide the opportunity to use hypermedia systems, multimedia electronic textbooks, etc.; contribute to the learning of rules and skills of "navigation" in the information space and the development of distance education; provide digital learning, interactive learning, work in virtual laboratories, etc. (Biletska et al., 2021).

3. New innovative learning technologies for the modernization of professional training of specialists in the educational process of higher education – distance, blended, and mobile learning.

Scientific research (Bukhkalov et al., 2023; Hepp et al., 2015; Hurman & Kviatkovska, 2023) proves that in higher education, among the innovative technologies that are successfully applied in the educational process, the following can be distinguished:

- Interactive teaching methods that promote active interaction of students with each other and with the teacher, develop creative abilities and critical thinking (group work, brainstorming, project method);
- Multimedia teaching aids that make the educational process interesting and more visual (personal computers, interactive whiteboards, multimedia projectors) (Kokhan et al., 2024).

Multimedia learning tools provide multimedia information presented in graphic and text form using sound data and video in the form of documents, tests, and questionnaires, which may contain links to other materials stored on another server and the same server. The user of the viewing program, using hyperlinks using the browser, has the opportunity to automatically connect to the source of information he needs on the network and request the document to which the link is made. The browser links to the computer network at the request of the Web server.

Modernity requires receiving higher education remotely thanks to information and educational technologies and communication systems, which is caused by the need to receive education by people with disabilities, to study without separation from production, etc.

Learning always, everywhere, all their lives with pleasure – this is approximately the idea of distance education (Kuzminskyi et al., 2021).

One of the important initiatives in the countries of the European Union is to ensure the information literacy of citizens. To this end, the following priorities of new innovative learning technologies have been introduced in the modernization of professional training of specialists in the educational process of higher education (Knysh et al., 2024):

- E-learning for European youth – the ability to use the Internet, multimedia technologies, and resources to acquire professional knowledge and master new skills and abilities;
- Creation of an innovative eCampus (electronic environment) for interactive communication of students and teachers for collective forms of learning and research;
- An important factor in economic and social progress is education, and education is a guarantee of equal opportunities in society. Therefore, the youth of Europe must have appropriate access to information, skills, and necessary knowledge to work and live fully in the information society;

- The need to provide every person with the opportunity to learn throughout life (lifelong learning) therefore, there is a need for continuous improvement of the professional level of employees;
- European content of the global network (eContent) to support enterprises to create jobs with information support – the introduction of teleworking;
- As part of the eEurope plan, e-learning, which is dedicated to the development of methodologies and tools for lifelong learning (creative approach, adaptability to innovations and technologies, new activities, collective forms of work, establishing intercultural ties with foreign colleagues).

Also, among the important and necessary new innovative learning technologies for the modernization of professional training of specialists are the creation of an educational environment and a future educational environment, the use of innovative learning models that use virtual reality to facilitate access to remote laboratories, new wireless mobile communication technologies for information access, and real-time access to multimedia information resources.

The latest innovative learning technologies for the modernization of professional training of specialists in the educational process of higher education include Bring Your Own Device, flipped classroom, learning, Event-based learning, critical thinking, Scenario-Based Learning, design technologies, case study, etc. (Sharples et al., 2014).

New advanced learning technologies in the modernization of professional training of specialists in the educational process of higher education provide a transition from textbooks to the use of Web 2.0 capabilities.

Electronic education is one of the 15 tools for the development of the information society and contributes to expanding students' access to knowledge, taking into account the possibility of building their own learning route; updating technologies, tools, forms, and methods of teaching disciplines. Electronic learning (mobile, distance, blended) acquires a special role in the light of the idea of continuity of education. Thanks to the capabilities of electronic learning, continuing education programs can reach different target audiences at a convenient time and in a convenient place.

So, we see a colossal impact on the education of the Internet and, as a result, a paradigm shift in terms of advanced education technologies in the modernization of professional training of specialists (Rebukha, 2022).

4. Providing the experiment.

Students were involved in the study and experimental work – 110 people at the ascertaining stage of the study and 130 people at the formative stage of the study: control group (CG) – 60 respondents, experimental group (EG) – 70 respondents, as well as higher education teachers (40 respondents).

We showed a pilot survey of educators of higher education institutions to control their state of readiness for the design and use of advanced teaching skills in the modernization of professional training of specialists in the educational process of higher education.

According to the results, it was found that teachers are required to use innovative teaching technologies in the modernization of professional training of specialists in the educational process to increase the efficiency of teaching. There are 99% of such teachers.

The main obstacle to the application of innovative teaching technologies in the modernization of professional training of specialists in the educational process of higher education by teachers was their own insufficient training in their quality design. Such teachers – 60%).

48% of teachers see a lack of educational and methodological materials on the use and design of innovative learning technologies in the modernization of professional training of specialists in the educational process of higher education.

19% of teachers see problems with access to technical equipment and high-speed Internet.

The task of the assessment stage was to study the current state of readiness of future specialists to apply and design innovative learning technologies in professional activities.

We consider the preparation of future specialists for the application of innovative technologies in professional activities as a structured, systematic, purposeful process of forming practical skills, improving theoretical knowledge and skills, the process of ability to create, select, and implement innovative models of training, professional activity, and personal development and, as a result, readiness to apply innovative technologies in professional activities.

The readiness of future specialists to apply and design innovative technologies of training in professional activity is a dynamic component that is subject to diagnosis at different stages of university training. Therefore, three of its levels have been established: high – constructive, sufficient – reproductive, low – initial. By the structure of readiness, the criteria for determining the levels and indicators are substantiated: motivational, cognitive, activity, and evaluation, which ensure the consistent formation of a systematic and holistic understanding of students about the feasibility and relevance of professional innovation activity in the workplace.

The results of the ascertaining stage of the analysis of the results obtained by students indicate that the highest level of formation of indicators is observed for the motivational criterion in respondents (10% – high level; 60% – sufficient level; 30% – low level) (Fig. 1).

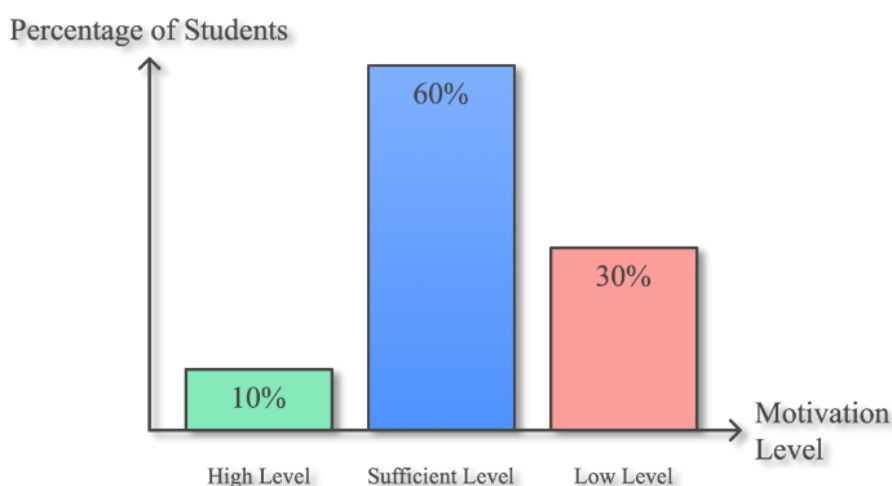


Figure 1. Distribution of Motivational Criterion Levels in Students.

The indicators for the cognitive and activity criteria were mainly at low (60% and 68%, respectively) and sufficient (40% and 32%) levels (Fig. 2).

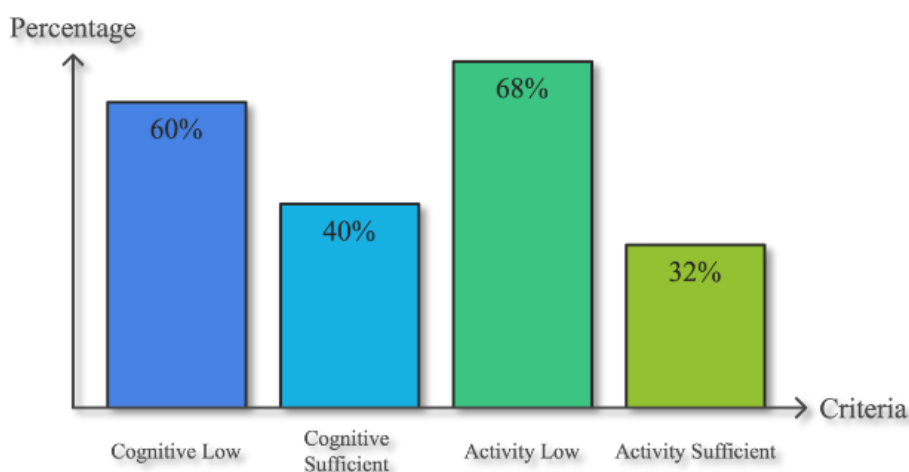


Figure 2. Levels of Cognitive and Activity Criteria.

According to the evaluation criterion, a high level was achieved by 10%, a sufficient level was achieved by 54%, and a low level by 36% of respondents (Fig. 3).

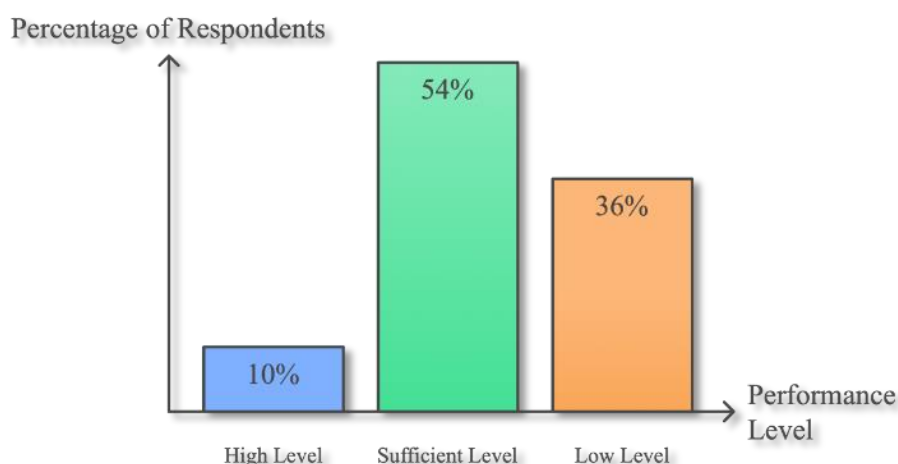


Figure 3. Distribution of Respondent Performance Levels.

According to the traditional methodology of modern universities, the overall indicator of the success of professional training of specialists in the educational process for the specified activity was in the range from 1.97 to 1.96, which proves its low effectiveness (training is considered effective if $k \geq 2.7$).

The ascertaining stage of the study showed that the readiness of students to implement innovative technologies is at an insufficient level, which confirmed the relevance of the study on the modernization of professional training of specialists and the role of innovative learning technologies.

As the core of professional training of specialists in the educational process of higher education and the role of innovative learning technologies, we considered the active activity of students throughout the entire period of study at the university. Its appropriate structuring led to the implementation of the specified goal. The study included several stages.

In the first – preparatory stage, the logic of the proposed structuring of the activities of the experimental groups provided for the activation of innovative independent search of students' adjustment of the content of professional disciplines from the cycle of practical and professional training of students with topics of innovative orientation.

In educational activities, innovative technologies were used (along with traditional ones): interactive lectures; lectures-visualizations, seminars-heuristic conversations, pedagogical training, seminars-discussions, seminars-business games, problem seminars, seminars-conferences, an auction of pedagogical ideas, creative essays, the brainstorming method, which contributed to the developmental impact on the creative and cognitive activity of students.

In the second – practical stage – the study of the special course "The Role of Innovative Learning Technologies in the Modernization of Professional Training of Specialists in the Educational Process of Higher Education" was introduced into the process of training specialists. The content of the special course revealed the essential features of innovation, integral qualities, and classification of innovations; showed the key characteristics of innovative learning technologies in the modernization of professional training of specialists in the educational process of higher education; proposed factors of innovative learning technologies and modern innovative learning models that are implemented in the educational process of higher education; highlighted the characteristic features of interactive learning technologies (Bring Your Own Device, flipped classroom, training, Event-based learning, critical thinking, Scenario-Based Learning, design technologies, casestudy, debriefing, interactive lectures; lectures-visualizations, seminars-heuristic conversations, pedagogical trainings, seminars-discussions, seminars-business games, problem seminars, seminars-conferences, auction of pedagogical ideas, creative essays, brainstorming method, project technologies, case method, web-quest (compilation tasks, Judgment tasks, retelling tasks, persuasion tasks, creative tasks, analytical tasks, self-knowledge tasks, scientist tasks, etc.; virtual learning tools (virtual

classrooms, complex and system simulators, virtual laboratories, situational, procedural simulators, "virtual teacher"; web resources, audio-, (video)-resources, training programs, computer workshops, test task packages, informational text materials with hyperlinks, etc.).

New innovative learning technologies were introduced into the educational process of EG in the modernization of training of specialists in the educational process of higher education – distance, blended, and mobile learning. Also among the important and necessary new innovative learning technologies for the modernization of training of specialists in the educational process was the creation of an educational environment and an environment of the future using innovative learning models (technotainment, tutoring model, the rotational model with the presence of "online stations", rotational model based on laboratories, contextual learning model, interactive learning model, problem-based learning model, student-centered model, flipped learning model, supportive and enriching bilingual learning model, etc.), that use virtual reality to facilitate access to remote laboratories, new wireless mobile communication technologies for information access, multimedia information resources for real-time access.

Taking into account the above, we used innovative approaches in the educational process of higher education. A significant approach is: – immersive learning, which is based on the immersion of students in the educational environment through interactive closed or open simulations. Open simulations include virtual interactive environments (websites, professional video games) where students perform actions related to the profession and communicate with virtual characters. Closed simulations organized in higher education allow students to practice with stakeholders or colleagues. To improve the educational process, modern technologies were used, such as tablets or smartphones, mobile applications, specialized programs, and websites, which allowed students to study at any time convenient for them, from any place. To improve the educational process of the higher school, virtual reality (VR) technologies were used to create interactive simulations where students practiced real situations in a professional space, which allowed students to interact with other virtual characters, feel like a part of reality, hold meetings and conferences in the virtual space, and gatherings to improve knowledge and skills. In particular, VR platforms were used: High Fidelity, EngageVR, Vspatial, Virtual Speech, Bigscreen, Mindshow, Ovation, AltspaceVR, ImmerseMe, Spatial, Venues, Vtime, Beyond VR, ClassVR and others.

We have introduced the latest innovative learning technologies for the modernization of professional training of specialists in the educational process – Bring Your Own Device, flipped classroom, training, Event-based learning, critical thinking, Scenario-Based Learning, design technologies, case study, etc.

The structure of the special course program for EG provides for deepening students' knowledge, familiarization, and communication on various aspects of innovative education: theoretical foundations of innovative activity at the present stage; foreign innovative technologies; the formation and development of the innovative movement in education to the present; features of the innovative activity of a specialist.

EG students compiled a thematic portfolio during the mastering of the special course, which included the results of their independent work. Throughout the entire period of study in higher education, EG students transferred practical skills and abilities acquired knowledge into various types of pedagogical practice.

In the third – experimental stage – EG supplemented students with innovative material for pedagogical practice, where the list of tasks contributed to ensuring an increase in the level of students' readiness to use innovative technologies. At this stage, after completing the formative stage of the study, the effectiveness of the introduced new innovative teaching technologies in the modernization of professional training of specialists was substantiated by comparing the results in the control and experimental groups.

A check (Kolmogorov-Smirnov criterion) was carried out for the equivalence of the samples using the data obtained. It should be noted that the two empirical distributions did not differ ($\lambda_{emp}=0.16 < \lambda_{cr}=1.36$) at the beginning of the formative stage, which allowed conducting a pedagogical experiment with selected students.

Based on the generalization of the results of experimental training, it should be noted that a comparative analysis of students' responses within the framework of their professional training at the university indicated the dynamics of students' readiness levels to apply innovative learning technologies in the modernization of professional training of specialists in the educational process of higher education and further professional activities.

As evidenced by the data obtained from the formative stage of the study, all readiness criteria underwent significant qualitative changes.

The grades of the formative stage of the analysis of the obtained results of students indicate that affording to the motivational principle, at the end of the experiment, we detect a significant rise in the indicator of the level of readiness of EG students to apply innovative learning technologies in the modernization of professional training of specialists:

- 75% of students showed a high level of the pointer (versus 10% before the beginning of the experiment); 25% of respondents showed a sufficient level (versus 60% before the beginning of the experiment); we did not find any students at a low level (versus 30% before the beginning of the experiment) (Fig. 4).

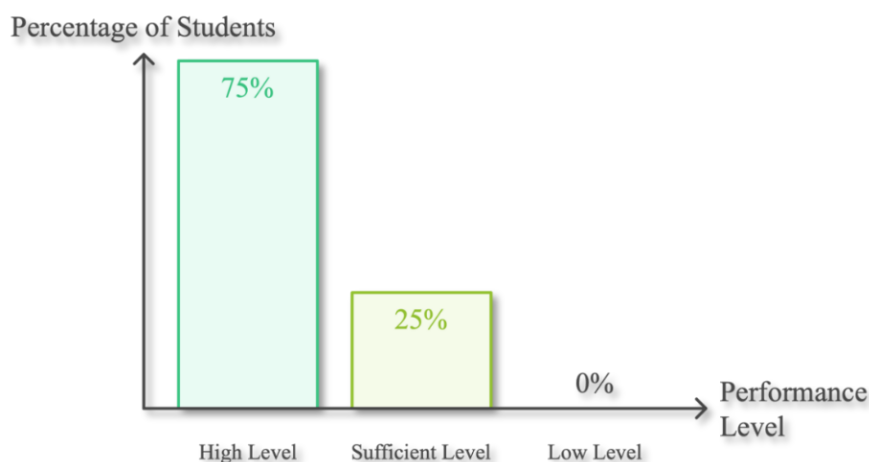


Figure 4. Student Performance Levels After Experiment.

The consequences of the formative stage of the analysis of the obtained results of students indicate that similar changes were observed in the indicators according to the cognitive criterion in respondents at the end of the experiment, with a significant increase in the indicator of the level of readiness of EG students to apply innovative teaching technologies in the modernization of professional training of specialists in the educational process:

- 80% of students reached a high level (before the beginning of the experiment, this indicator was not recorded in the respondents), 20% of students were diagnosed with a sufficient level (versus 40% before the beginning of the experiment); no students with a low level of readiness were identified (versus 60% of students before the beginning of the experiment) (Fig. 5).

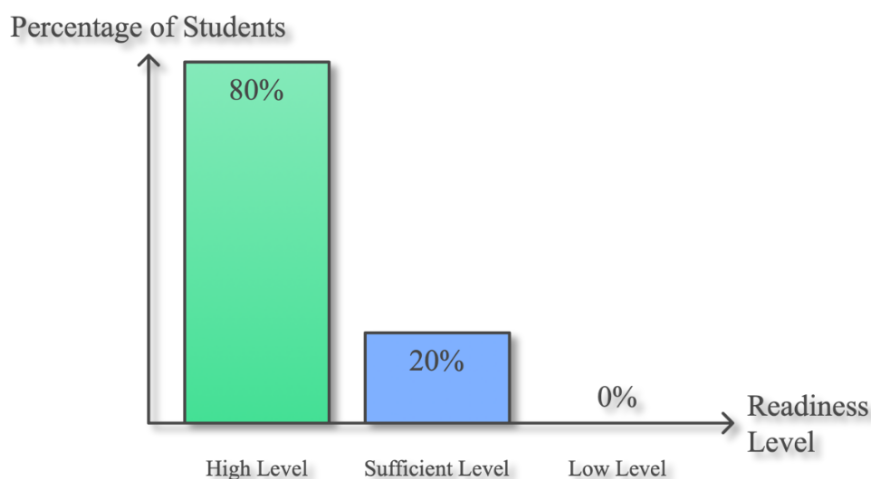


Figure 5. Student Readiness Levels Before and After Experiment.

The outcomes of the formative stage of the analysis of the obtained results of students indicate that similar changes were experienced by the indicators according to the activity criterion – in the EG respondents at the end of the experiment, we detect a significant increase in the indicator of the level of readiness of EG students to apply innovative teaching technologies in the modernization of professional training of specialists: 80% of the students in the experimental group demonstrated a high level (versus zero indicators before the beginning of the experiment); 20% of the respondents showed a sufficient level – (versus 40% before the beginning of the experiment), and the low-level indicators were reduced to zero (versus 68% before the beginning of the experiment) (Fig. 6.).

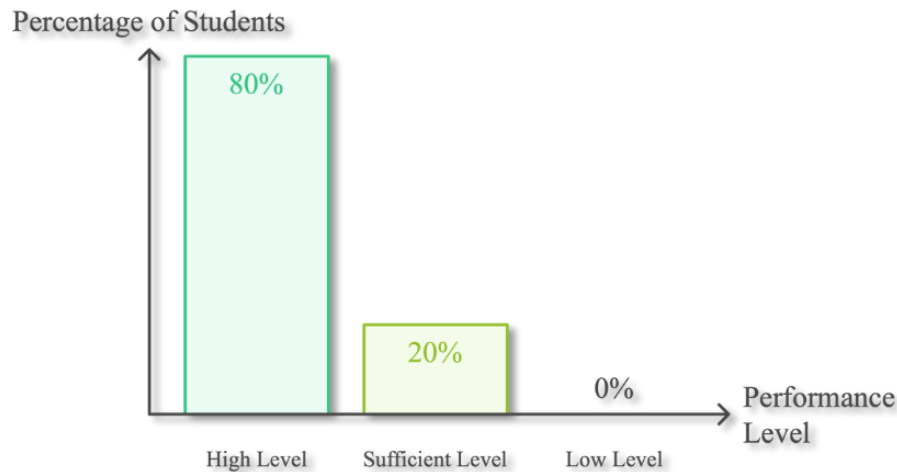


Figure 6. Performance Levels in Experimental Group.

The consequences of the formative stage of the analysis of the obtained results of students indicate that similar changes were experienced by the indicators according to the evaluation criterion – among the EG respondents at the end of the experiment, we detected a significant growth in the indicator of the level of readiness of EG students to apply innovative learning technologies in the modernization of professional training of specialists in the educational process of higher education:

- 68% of respondents reached a high level of development (before the beginning of the experiment – 10%); 32% of respondents reached a sufficient level (before the beginning of the experiment – 54%). The results of the low level are a zero indicator (before the beginning of the experiment – 36% of students) (Fig 7.).

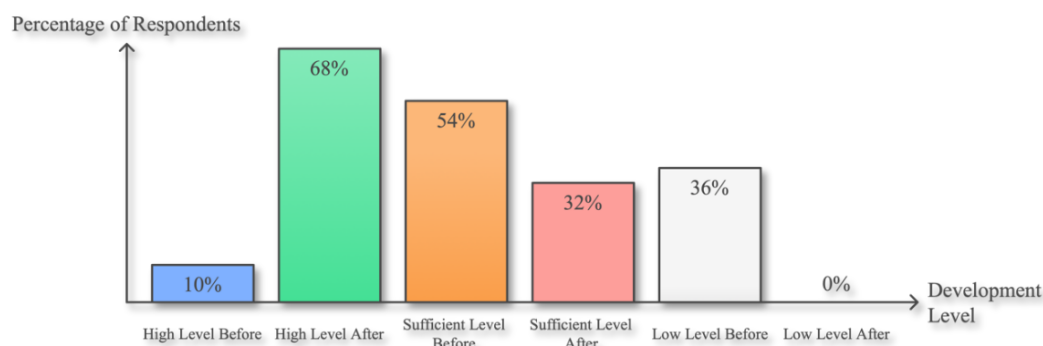


Figure 7. Development Levels Before and After Experiment.

We formulate the null and alternative hypotheses:

Ho: taking into account the arithmetic mean of the scores in the experimental groups and the control groups we say that the methodology for applying innovative technologies in higher education does not affect the educational process of respondents $2 \times 1 \times x = 1 \times 2 \times x$.

H1: the proposed methodology for applying innovative technologies in higher education is effective for the educational process of higher education $1 \times 2 \times x$.

Conducting significance tests showed that the probability value reflects the strength of evidence against the null hypothesis.

When the hypothesis testing procedures were developed, something (if it meant something) was “significant”. Thus, we note: finding that the effect is statistically significant means that the effect is not random, but real.

Also, by conducting statistical significance tests, we obtained evidence in support of the alternative hypothesis.

A result was considered statistically significant because it had a p-value below a predetermined threshold (0.05) and had a low probability of occurring by chance. If the p-value falls below this threshold, it means that the observed effect is not a random fluctuation but a true discovery. In statistical tests, the standard deviation is necessary to assess the variability of sample data and is also important for calculating the test statistic and gives an idea of the spread of data points around the mean. For tests such as the t-test, which have mean differences or values in the means, the t-test was calculated. How much the sample mean deviates from the hypothetical population mean in terms of standard error was shown by the t-test, which was calculated using the formula: $t = (\text{sample mean} - \text{hypothetical mean})$. Critical values indicate the threshold at a chosen significance level at which results are considered statistically significant. It is statistical significance that determines the level of confidence in the results of a study. A statistically significant result means that the difference or observed effect is not due to chance and gives us additional confidence in our conclusions.

The dynamic growth of the number of respondents of the EG, who showed a high percentage of mastering the methodology of applying innovative technologies at a sufficient and high level, indicates that the proposed special course of the specified training is statistically justified and effective, which was found out using the χ^2 – Pearson criterion: for all components (at $p \leq 0.01$) the level of readiness of EG students is higher than that of CG students.

To identify differences between the two groups – EG and CG, a comparison of the results of the survey of respondents was conducted. The results of the formative stage of the analysis of the obtained student results indicate that significant positive changes were experienced by the indicators according to all criteria – in EG respondents at the end of the experiment, we observed a significant increase in the indicators of the level of readiness of EG students to apply innovative teaching technologies in the modernization of professional training of specialists in the educational process of higher education:

These differences at the level of statistical significance are manifested in the level of preparation for the application of innovative teaching technologies in the modernization of professional training of specialists in the educational process of higher education based on the proposed special course "The role of innovative teaching technologies in the modernization of professional training of specialists in the educational process of higher education" and the developed methodology.

Affording to the consequences of generalization and analysis of the results of experimental work, we conclude that the level of preparation for the application of innovative teaching technologies in the modernization of professional training of specialists based on the special course ensures the achievement of expected results, which is important in the further professional activity of specialists. Therefore, we have developed methodological recommendations for the application of innovative teaching technologies in the modernization of professional training of specialists and their further application in professional activity.

5. Methodological recommendations for the application of innovative teaching technologies in the modernization of professional training of specialists in the educational process of higher education.

Based on the analysis of research results, we offer the following practical recommendations for improving the training of qualified personnel based on modern universities for innovative activities:

- Creation of a blended system of accelerated education, which combines operational online learning and social development technologies based on the use of information from a single knowledge bank of partner organizations;

- Digitization of means of obtaining and mastering knowledge and skills based on the common content of electronic educational resources;
- Embedding modules of fundamental knowledge in learning technology;
- Training and advanced training of specialists in knowledge management based on such techniques of supporting collective decision-making as facilitation, moderation, etc.;
- Comprehensive implementation of the possibilities of implementing a dual form of education as a combination of training in educational institutions with training in the workplace;
- Creation of a new type of educational-scientific-production complex, capable of raising the scientific and technical culture of production, ensuring the development of labor resources.

Research limitations

The implementation of the pedagogical experiment was carried out in three stages during 2022-2024: preparatory, main, and final.

At the preparatory stage, 2022, the goal and objectives of the study were determined, the experimental plan was developed, the methods of measuring and processing the results were determined, the control and experimental groups were selected, and their homogeneity was checked.

At the main stage, 2023, the experiment was conducted.

At the final stage, 2024, the results of the experiment were analyzed, their reliability was confirmed, and conclusions were drawn about the pedagogical effect of the experiment.

Research relies heavily on the accuracy and reliability of data. The following digital data collection tools were useful in the study: MS Excel and SPSS (Statistical Package for Social Science) programs.

The total sample size in the article is 240 respondents. The sample of respondents was formed by random selection using the technical procedure for calculating the selection step.

During the experimental study, diagnostic data on the levels of social competence of higher education applicants were determined through information influence and divided into a control group (60 students) and an experimental group (70 students).

The study was implemented by applying methods and various forms: multimedia technologies (projector, multimedia board, video, and audio equipment), software that combines animation, graphic, text, video, and sound data and information, and their simultaneous use in the information space; mobile devices, personal computer, web-oriented resources that are freely available and free of charge (YouTube, author's website, specialized sites, social networks, cloud technologies, social network technologies), etc.

The limitations of this study allowed it to have the following impact on the results: improving the qualitative characteristics of the material, optimally specified goals and objectives, and increasing the effectiveness of the results.

Future research directions

Further study is required on the issues of organizing the international activities of a modern university, primarily specifying priority areas and current tasks of innovative activities in the context of the internationalization of higher education.

Future research directions can be used to study the effectiveness of combined teaching methods that combine traditional and innovative approaches, as well as the impact of individual learning trajectories on student success. It is worth investigating the use of artificial intelligence to personalize learning, analyzing the long-term consequences of using virtual simulations in natural disciplines and developing approaches to improving social and communicative skills in combination with innovative teaching tools.

Conclusions

The essential features of innovation, classification, integral qualities of innovation, and key characteristics of innovative learning technologies have been clarified: factors of innovative learning technologies and modern innovative learning models.

Our research has introduced important and necessary new innovative learning technologies for the modernization of professional training of specialists: the creation of an educational environment and a future educational environment, the use of innovative learning models that use virtual reality to facilitate access to remote laboratories, new wireless mobile communication technologies for information access, and real-time access to multimedia information resources.

The latest innovative learning technologies for the modernization of professional training of specialists in the educational process of higher education include Bring Your Own Device, flipped classroom, learning, Event-based learning, critical thinking, Scenario-Based Learning, design technologies, case study, etc. New innovative learning technologies in the modernization of professional training of specialists in the educational process provide a transition from textbooks to the use of Web 2.0 capabilities.

Students and teachers of higher education were involved in the research and experimental work. The ascertaining stage of the study showed that the readiness of students to implement innovative technologies is at an insufficient level, which confirmed the relevance of the study on the modernization of professional training of specialists in the educational process of higher education and the role of innovative technologies of education.

The outcomes of the formative stage of the analysis of the obtained results of students indicate that similar changes were experienced by the indicators according to the activity criterion – in the EG respondents at the end of the experiment, we detect a significant increase in the indicator of the level of readiness of EG students to apply innovative teaching technologies in the modernization of professional training of specialists: 80% of the students in the experimental group demonstrated a high level (versus zero indicators before the beginning of the experiment); 20% of the respondents showed a sufficient level – (versus 40% before the beginning of the experiment), and the low-level indicators were reduced to zero (versus 68% before the beginning of the experiment).

Based on the generalization of the results of the formative stage of experimental training, we note that the dynamic growth in the number of EG respondents who showed a high percentage of mastering the methodology of applying innovative technologies at a sufficient and high level indicates that the proposed special course of the specified training is statistically justified and effective, the level of readiness of EG students is higher than that of CG students.

Further research necessitates consideration of the issue of updating the technological content of professional training of future specialists in the background of the integration of higher education into the European educational space.

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Mental maps as an innovative tool in university training

Ментальні карти як інноваційний інструмент університетської підготовки

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Abstract

The article reveals the content and considers the mental map from the perspective of innovative training of specialists in the modern educational environment of higher education. Different positions of considering the mental map as an innovative tool in training specialists are shown. Cloud services are presented that can be used in developing mental maps when preparing seminar or lecture classes, and types of mental maps in the modern educational environment of higher education are identified. The rules for creating them are developed, and the advantages of a mental map as an innovative tool in training specialists in the modern educational environment of higher education are shown. Comparison of quantitative and qualitative analyses of the results of the experiment indicates that the implementation of pedagogical conditions in the process of introducing a special course in EG according to the components of the diagnostic

Анотація

У статті розкрито зміст та здійснено розгляд ментальної карти з позиції інноваційної підготовки фахівців у сучасному освітньому середовищі вищої школи. Показано різні позиції розгляду ментальної карти як інноваційного інструменту при підготовці фахівців. Представлено хмарні сервіси, які можна використовувати у процесі розробки ментальних карт при підготовці семінарських чи лекційних занять та виокремлено типи ментальних карт у сучасному освітньому середовищі вищої школи. Розроблено правила створення та показано переваги ментальної карти як інноваційного інструменту при підготовці фахівців у сучасному освітньому середовищі вищої школи. Порівняння кількісного й якісного аналізів результатів експерименту вказує на те, що реалізація впровадження педагогічних умов в процесі введення спецкурсу в ЕГ за компонентами

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apparatus led to statistically significant changes, an increase in scores on the motivational criterion, cognitive criterion, activity criterion, and evaluation criterion, and therefore we observe positive dynamics in the use of mental maps by higher education applicants and their positive impact on the process of training specialists in the modern educational environment of higher education.

Keywords: training of specialists, higher education, cloud services, mental map, innovations in education.

діагностичного апарату привела до статистично важливих змін, збільшення оцінок за мотиваційним критерієм, когнітивним критерієм, діяльнісним критерієм і оцінювальним критерієм, а відтак спостерігаємо позитивну динаміку використання ментальних карт здобувачами вищої освіти та їх позитивний вплив на процес підготовки фахівців у сучасному освітньому середовищі вищої школи.

Ключові слова: підготовка фахівців, вища школа, хмарні сервіси. ментальна карта, інновації в освіті.

Introduction

The problem of training new generation teachers is caused by a set of factors, including the renewal of the content of education; a significant expansion of the professional functions of the teacher as a subject of innovative activity; the need to constantly search for new innovative forms, methods of teaching and upbringing, taking into account the realities and needs of practice; the ability to build conceptual foundations of pedagogical innovations; the need to involve students in search activities and experimentation, occupy leading positions. Under such conditions, there is a need to rethink the priority areas of development of higher pedagogical education, one of which is the modeling of an effective system of professional training of a competent teacher focused on innovative activity (Stupak, 2022).

Modern conditions for training higher education specialists stimulate and increase the interest of scientific and pedagogical workers in the use of interactive teaching aids, information visualization, and high-quality presentation of theoretical material, as well as the organization of students' educational and search activities. Among the innovative technologies used in the training of specialists, we can name: online boards, quizzes, web quests, and mental maps.

Various platforms and resources used during distance learning should complement each other and perform certain functions in the educational process. At the same time, working with mind maps remains a universal and generalizing technology, and expanding the possibilities for using online resources to create them is seen as a relevant and relevant issue (Lavrenova, 2019).

95.7% of teachers know what a "mind map" is, and more than 58.7% of teachers use mind maps in their work. 65.6% of teachers believe that it is appropriate to use mind maps in their work, and 34.4% believe that it is not. Such results indicate that teachers follow the innovative trends of modern primary education, and understand the current directions of its development.

At the same time, a theoretical analysis of the problem showed that the issue of mind maps as an innovative tool for university training has not been the subject of separate research in both theoretical and practical aspects.

The use of mental maps in the quality training of future specialists is currently a relevant issue of the theory and methodology of learning in the educational process. Based on this, we considered the following questions in the article:

- The content and consideration of the mental map from the perspective of innovative training of specialists in the modern educational environment of higher education.
- Different positions of considering the mental map as an innovative tool in the training of specialists.
- Cloud services can be used in the process of developing mental maps when preparing seminars or lectures.
- Types of mental maps in the modern educational environment of higher education.
- Using online resources to create interactive online mental maps.
- Rules for creating and advantages of a mental map as an innovative tool in the training of specialists in the modern educational environment of higher education.

Literature Review

The topic of using mental maps is being studied by modern scientists in connection with learning and the generation of new ideas. In the first case, visually structured data contributes to easier memorization, and in the second – the ability to understand the structural units of the problem for further analysis. The effectiveness of mental maps for the memorization process is being studied by most scientists. Currently, several researchers M. Lavrenova (2019), I. Sydoruk (2020), and O. Stupak (2022) analyzed the educational process of higher education regarding the experience of using mental maps and their use in the work of specialists.

The involvement of the mental map technique in the training of specialists in the modern educational environment of higher education is justified and is studied by scientists from various disciplines. Thus, V. Shcherbatiuk (2020) draws attention to the features of the visualization tool, the use and production of mental maps in higher education institutions during the teaching of literary disciplines. He proves that the mental map method is an effective tool that ensures the preservation of information in the student's memory and structuring for subsequent effective retrieval. He introduces the concept of clip thinking to the study of literary disciplines as a way to increase the efficiency of the learning process, as an acquired quality of the modern generation.

At the same time, mental maps in scientific research are defined as an innovative way of organizing information in the educational process of higher education institutions, which makes it possible to actualize the work of the right (figurative) and left (logical) hemispheres of the brain simultaneously through a radial presentation of the content of education. The use of mental maps allows for mutually complementary activities of the teacher and students, resulting in the most complete awareness of a specific topic by the subjects of educational activity.

L. Panina (2020) outlines the effectiveness of using mental maps as one of the ways to develop students' critical thinking in the process of studying the Ukrainian language and literature, improving the quality of knowledge of students in secondary education institutions. The researcher analyzed the methods of using mental maps, analyzed the main functional characteristics of mental maps, and characterized the features of their creation and structure. O. Hyria (2022) shows the possibilities of using mental maps to form integrated knowledge of students in chemistry lessons, to apply them in extracurricular work, in the process of creating group and individual projects to help systematize and organize scientific information, thoughts, assess the volume and planning of work, group scientific data, initiate new ideas, and summarize scientific achievements in a certain field of research. The developed mental maps for the school course of human biology by T. Pozdniakova (2018) were tested. The relevance of using mental maps in the professional activity of a teacher is substantiated; the stages of creation and the basic principles of mental maps are considered; various ways of using mental maps in the educational process are proposed.

According to the results of the analysis of scientific and methodological literature, it was found that a small number of works are devoted to the development and implementation of mental maps in the educational process of higher education institutions, which contribute to the formation of theoretical knowledge and practical preparedness, which requires further scientific research, emphasizing the relevance and practical component of the chosen direction of research.

The relevance of the problem is enhanced by the need to eliminate contradictions in the research process between:

- Society's need for highly qualified specialists and the presence of stereotypes regarding prioritizing professional specialties;
- The need to improve the quality of student learning and the insufficient use of mental maps to implement didactic goals in the educational process of higher education institutions;
- The potential pedagogical capabilities of ICT and the degree of substantiation and experimental verification of the didactic conditions for the use of mental maps in the process of student learning.

Thus, the relevance of the problem raised, the theoretical and practical benefits of its solution, the lack of development in pedagogical science, as well as the need to eliminate the identified contradictions determined the choice of the topic of the article.

The study's purpose is to prove the mental map's effectiveness as an innovative tool in the training of specialists in the modern educational environment of higher education.

Methodology

To achieve the goal, the following research methods were used: theoretical – analysis of philosophical, pedagogical, methodological literature on the research problem, system analysis to compare different points of view on the problem under study and to determine the conceptual and categorical apparatus of the study, consideration of theoretical issues, justification of pedagogical conditions and the developed special course "The use of mental maps in the professional training of students in the modern educational environment of higher education for high-quality learning"; empirical – diagnostic methods (questionnaires, interviews, surveys), observational methods (observation), experimental (conducting a pedagogical experiment) to determine and verify the level of use of mental maps by higher education applicants and their positive impact on the process of training specialists in the modern educational environment of higher education; methods of mathematical statistics – to analyze the results obtained.

The implementation of the pedagogical experiment was carried out in three stages: preparatory, main, and final.

At the preparatory stage, the goal and objectives of the study were determined, the experimental plan was developed, methods of measurement and processing of results were selected, control and experimental groups were selected, and their homogeneity was checked.

At the main stage, the experiment was conducted.

At the final stage, the results of the experiment were analyzed, their reliability was confirmed, and conclusions were drawn about the pedagogical effect of the experiment.

The experiment was attended by 48 EG students and 46 CG students, which corresponds to the calculation data since the sufficient sample size is 94.

The reliability and validity of the results obtained, and the objectivity of their assessment were ensured by the methodological soundness of the initial positions and the qualimetric mechanism for assessing the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

To assess the homogeneity of experimental and control data collection, statistical processing was carried out using MS Excel and SPSS (Statistical Package for Social Science) programs.

In our article, we used quantitative methods of data analysis. This group of empirical research methods includes methods of obtaining information about the object under study that allow identifying its quantitative characteristics.

The experimental work was carried out without violating the structure of classes in the conditions of the current educational process of higher education and the content of the curriculum provided for by the curricula. The main base for the experiment was higher education institutions.

In the ascertaining experiment, the CG and EG of students were determined, and the levels of readiness of future specialists for the development and application of mental maps as an innovative tool in the modern educational environment of higher education were studied. In this case, experimental research methods were used: observation, questionnaires, conversations, and surveys.

The ascertaining stage of the study was conducted in the modern realities of higher education to develop a diagnostic apparatus, identify the state of the problem under study, determine its pedagogical feasibility and relevance, and form students' independent work. First-year undergraduate students participated in the ascertaining stage of the study. At the ascertaining stage, a question was proposed to clarify the feasibility of using and the ability to use mental maps as an innovative tool in the training of specialists in the modern educational environment of higher education. The results obtained indicate that for working with the use of mental maps in professional training in the modern educational environment of higher education for high-

quality education of higher education, students were not prepared, that is, students who had recently entered the university did not have practical skills in working with mental maps, did not know cloud services that can be used in the process of developing mental maps in the preparation of seminar or lecture classes; could not name the types of mental maps in the modern educational environment of higher education, did not know the rules for creating and the advantages of a mental map.

At the formative stage of the experiment, pedagogical conditions were introduced, and a special course “Using mental maps in the professional training of students in the modern educational environment of higher education for high-quality learning” was developed, which was introduced in the EG, and the CG studied according to the usual methodology.

A comparison of the quantitative and qualitative analyses of the experiment results indicates that the implementation of pedagogical conditions in the process of introducing a special course in EG according to the components of the diagnostic apparatus led to statistically significant changes, an increase in scores on motivational, cognitive, activity and evaluation criteria, and therefore we observe positive dynamics in the use of mental maps by higher education applicants and their positive impact on the process of training specialists in the modern educational environment of higher education.

As a result of the experiment, a non-parametric method of testing statistical hypotheses was used to verify the reliability of the conclusions – the Wilcoxon criterion. The processing of experimental data allowed us to verify the application of statistical methods and obtain confirmation of the correctness of the research methodology and the achievement of the set goal.

Results and Discussion

1. The content and consideration of the mental map from the perspective of innovative training of specialists in the modern educational environment of higher education.

Mental map, mental map, intellectual map, memory map, mental action map, idea map, thought map – these are different names for the Mental mapping method. The main feature of this method is to clarify the information by mapping, visualization, and presentation.

Mental maps, created using software or on paper, are a set of schemes and diagrams that visually demonstrate theses and thoughts united by a common idea and interconnected; a tool for displaying in visual form the process of structuring information and thinking; a convenient way to depict using schemes the process of systemic general thinking. The main keys are the elements of the map (triggers): drawings and words, each of which symbolizes a certain memory, helps to use the full potential of the mind, and contributes to the emergence of ideas and new thoughts (Lavrenova, 2019).

Mental maps, when studying a certain topic, are structural and logical schemes of content and procedural aspects, innovative tools in the training of specialists, which reflect in a radial form the connections of the key concept, which constitutes an indissoluble unity and is located in the center with other concepts of this problem (topic) and become obvious and visual for students, allowing them to look through the prism of their intersystem connections practically when studying each concept (Havrysh, 2007).

Mental maps (Fig. 1):

- Stimulate the creative development of each student in the modern educational environment of higher education;
- Reflecting the systematicity and integrity of the student's knowledge, ensuring the implementation of the principles of integrated education;
- Contribute to the development of new systems of views of higher education applicants and their intellectual development and search;
- Visualize the materials that need to be mastered and studied;
- Improve the processes of information processing and memorization by the individual (Souza Filho et al., 2021).

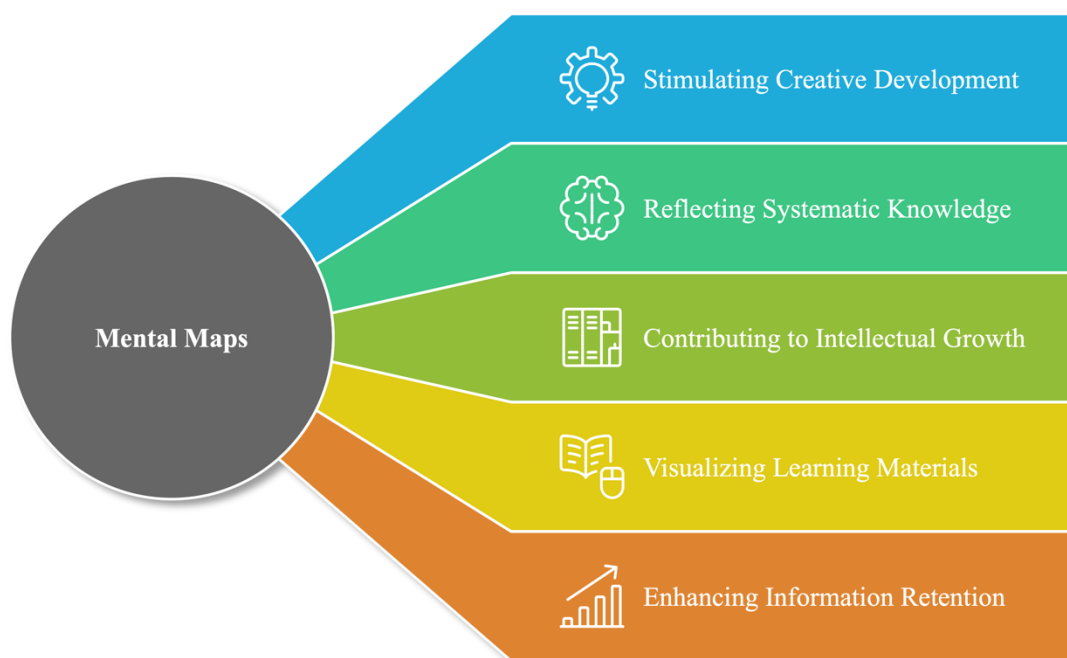


Figure 1. Unveiling the Multifaceted Benefits of Mental Maps.

That is why mental maps are defined in the educational process of higher education institutions as an innovative way of organizing information, which, through a radial presentation of the content of education, simultaneously actualizes the work of the figurative (right) and logical (left) hemispheres of the brain. The use of mental maps in cloud services allows for complementary mutual activity between students and the teacher, resulting in the complete awareness of the subjects of educational activity of a specific topic (Romanovskiy et al., 2018).

The essence of mental maps, which exist using graphic images, is the symbolization and systematization of information. Through the representation of the existing cognitive field or content or the creation of associations, systematization is reflected in mental maps.

At the same time, symbolization is provided by combining a sign with a word, picture, or symbol, for example (Leite & Rodrigues, 2021):

- Codes (symbols, figures, checkmarks, “minus”, “plus” signs, etc.) encrypt information that is easy to “read” in different places on the map;
- The connection of concepts is shown by arrows located in different parts of the mental map;
- Geometric figures emphasize different associative rows on the map;
- The relationship between concepts (in different parts of the map) reflects color and highlights individual blocks of elements, combines structural components;
- Creative images and drawings facilitate memorization and perception, deepen the content, and associate with the theme of the intellectual map.

2. Different positions of considering the mental map as an innovative tool in the training of specialists.

The mental map as an innovative tool in the training of specialists in the modern educational environment of higher education is considered from two positions:

- 1) **As a tool for systematizing information and its visualization** – from the position of a scientific and pedagogical worker. The mental maps created by the teacher contribute to giving personal meaning to the information, which results in a lecture presentation for students with an orientation towards a radiant record decorated with associative meanings rather than a textual summary. The information presented by the teacher in the form of a mental map allows him to teach without a rigid attachment to

the text, while the holistic plan of the lecture information is always before the eyes of the teacher and the student (Romanovskiy et al., 2018);

- 2) **As a technology for mapping and taking notes of educational information during lectures** – from the position of a higher education student. At the same time, when it is necessary to remember a significant amount of information, structuring and constructing mental maps allows the student and teacher to save time. A mental map has several advantages over short notes or usual note-taking. A mental map allows you to understand the relative importance of each single idea, identifying the main idea that is placed (according to the location from the center) in the center of the sheet and using lines to capture the connections between key concepts. The structural nature of a mental map allows you to supplement it with new information without any corrections (Díaz Álvarez et al., 2023). Mental maps can be used in practical lecture classes and during independent work for creating presentations, developing projects of varying complexity, developing students' intellectual abilities, brainstorming, etc. (Pozdniakova, 2018).

A mental map allows you to structure and systematize the material, establish semantic and content connections, and monitor a certain development of events. Speaking about the skills and abilities of educational activities of higher education students that are necessary for training specialists in the modern educational environment of higher education, mental maps are a “means of simplification, schematic representation” of mental operations (of all types) that develop critical thinking, improve concentration, memory, and a sense of proportion. Mental maps, by setting up joint work of higher education students, attract their attention and make presentations and classes more meaningful and interesting; the material of the class can be easily adapted to changing conditions, and, thanks to mental maps, it becomes less cumbersome. Mental maps demonstrate constructiveness, consistency, and creativity and not only operate with factual material because they focus on information that directly relates to the subject being studied (Panina, 2020).

3. Cloud services can be used in the process of developing mental maps when preparing seminars or lectures.

Given the purpose of our study, we will analyze cloud services that can be used in the process of developing mental maps when preparing seminars or lectures and dwell in more detail on the position of using mental maps.

Google is an online application that provides a free plan for creating mental maps with the ability to create your own three diagrams in the free version. It has an awesome version that is suitable for professional or personal use by a student with additional features and increased security; it provides saving of the mental map in PDF format and has unlimited access to downloading images (Sulym et al., 2023).

MindMeister is a fairly easy-to-use program with a user-friendly interface. In the free version, you can build three Mental maps with the addition of links to video material, images, icons;

BubblUs is an online service, a relatively free web application that allows you to create mental maps relationship diagrams online, allows you to export in image format, and has an English-language interface. The disadvantage of the free version is the ability to create only three mental maps online and export them in image format (this is the only limitation), and the Premium version allows you to store up to 5 MB of information and upload images;

Popplet is an English-language service that is powerful and easy to use in terms of functionality. Allows you to create one mental map in the free version with the addition of videos from YouTube, images, and text, and also supports joint editing of the map by a group for teamwork (Stupak, 2022).

Mindomo – software for creating relationship diagrams using the Internet. It can create only three mental maps online in the free version and export them in image format for free;

MAPMYself (Mapul) – an online service for creating hand-drawn professional relationship diagrams built on SilvrLight. It can create only two mental maps online in the free version and export them in image format for free.

MindMeister – for those with small design requests, the program is worth paying attention to. MindMeister – supports export to pdf, MindManager 6 (Mmap), FreeMind (Mm), as well as to an rtf document or as an image (jpg, gif, png) – Web 2.0 application for building relationship diagrams, which can create only three mental maps online in the free version and export them in image format. It has a fairly wide functionality

even in the free version: different colors and styles of blocks, changing the font and color of the text (Balalaieva et al., 2023).

SpiderScribe – a free service (Adobe Flash). With this service, you can accompany ideas with documents, calendars, and images to visualize ideas. Map nodes can contain a picture (jpg, png), simple text, a map (GoogleMap), a date (calendar), or an attached file. Export to jpg and png supports the work of several people on one "mental map"; there are no problems with Cyrillic support, and the interface is English;

Xmind – the program works on Windows / Mac / Linux platforms, is one of the most popular programs for creating mental maps, and has several versions: paid with advanced functionality but free with reduced capabilities;

Freemind program – has the necessary set of functions for creating high-quality mental maps and is a completely free application that works on any platform supported by Java (Pozdniakova, 2018).

Mental maps involve students of all levels in organizing and solving educational and professional problems active creative thinking, are ideal for use in educational institutions, and can be used in any type of task (Knysh et al., 2023).

4. Types of mental maps in the modern educational environment of higher education.

There are different types of mental maps depending on the scope or application:

- **Standard maps** – classic mental maps that serve to reveal one's own individuality, assimilate, and record ideas;
- **Speed maps** – mental maps that stimulate thought processes. A map can be, for example, a short one-color summary made before a lesson or flash cards – for better assimilation of the studied material;
- **Master maps** – maps for an entire field of knowledge, very voluminous, for example, based on materials from one semester – intended for a general overview of the entire topic and are compiled continuously;
- **Mega maps** – mental maps that are connected to each other (Reichert Coelho & da Silva Mendes, 2019).

A map with a relatively small number of levels – the central map is connected to the following maps, which present additional aspects or details. It increases the cognitive interest of students and the effectiveness of learning. Mental maps are appropriate at different stages of classes in the modern educational environment of higher education. They help to implement the principle of clarity, one of the principles of pedagogy, because they contribute to covering the subject of the subject at a glance. The most important thing in associative comparisons and connections is shown by the flowchart. The use of mental maps during the study of new material reduces the risk of misinterpretation of important concepts and helps the teacher to convey to the students a generalized clear idea of the material being studied (Buzan & Buzan, 1993).

5. Using online resources to create interactive online mental maps.

The current level of development of information and communication technologies allows the creation of interactive mental maps using online resources. A significant number of online services exist for creating mental knowledge. The most common of them are Bubbl.us, FreeMind, XMind, Zoho, MindMeister, Mindomo, Mind42, Gliffy, and many others. Online mental maps created by a teacher can be used in the educational process by opening comments to the blocks of the mental map, as a lecture outline, viewing video files and pictures, opening other online resources from hyperlinks, step by step revealing a certain topic to students, using elements of clarity in this educational process. With the help of mental maps, the material will be better perceived by students and will be much more interesting (Lavrenova, 2019).

So, summing up the above, we can conclude that the use of online resources when creating interactive mental maps online provides the following opportunities in the educational process of higher education:

- Generate ideas;
- Improve memory;
- Inspire the search for a solution;
- Recall words, facts, images;
- Demonstrate concepts and diagrams;

- Structure work;
- Analyze events or results;
- Organize interaction in role-playing games or group work;
- Effectively process and structure data;
- Summarize the work done.

The use of online resources when creating interactive mental maps online provides the construction of mental maps either "by hand" or on paper, which contributes to maintaining the comfort of the student's thinking and activating the person's creative thinking (Romanovskyi et al., 2018).

When creating interactive online mental maps, it is necessary to adhere to a certain algorithm:

- 1) **Determine the main idea, the object of study** (central concept) – the teacher's area of responsibility;
- 2) **Select the main branches from the main concept** (basic structural units) that are related to the main object – the teacher's area of responsibility;
- 3) **Supplement the mental map with branches that depart from the structural units** (additional information) – the student's area of responsibility;
- 4) **Arrange branches with words around the main node** (main concept) – the student's area of responsibility;
- 5) **Consider exaggerated or incompletely reproduced structural nodes** (if necessary, editing the mental map) – the collective area of students and the lecturer (Leandro & Canto, 2019).

Independent construction (depending on the task that needs to be solved) by students of a mental map according to the specified algorithm can provide for an author's approach at all stages of educational activity.

Let's reveal the basic **rules for building Mental mapping**:

- 1) The object of attention is concentrated in the very center of the subject of activity;
- 2) The main subtopics related to the object of attention diverge from the branch, central image, or idea;
- 3) Taking the form of smooth lines, the branches are explained or indicated by key images or words. Microthemes (secondary ideas) are also depicted by branches that depart from subideas – branches of a higher order;
- 4) A connected nodal system is formed by branches. Higher education students can create a mental map on flipcharts, on the board independently, on separate sheets of paper in their notebooks;
- 5) Building maps does not require special artistic abilities: you need to have colored pencils or chalk, imagination, and an idea;
- 6) You can also create mental maps using separate services <http://cooggle.it>; <http://app.popplet.com>, etc., and computer programs (MindMap, ConceptDraw, MindMapper, etc.) (Buzan, 2018).

The construction of individual mental maps by students of higher education will allow the teacher to assess the level of understanding of the educational material by students and will help the students themselves to comprehend, critically analyze, and select the main information. The graphic method of presenting information allows for better memorization, systematization, and assimilation of the material, captivates students during learning – and, as a result, improves thinking and memory, which has a positive effect on the results of the educational achievements of future specialists (Shuliak et al., 2022).

6. Rules for creating and advantages of a mental map as an innovative tool in the training of specialists in the modern educational environment of higher education.

You need to know the basic rules for creating mental maps for their direct creation and innovative use:

- The hierarchy of thought cannot be violated;
- The main branches of the mental map should be bold, resembling tree branches or octopus tentacles;
- The use of different colors for the main branches is mandatory, which helps in a structured and holistic perception of the material;
- The central concept of the mental map must necessarily contain at least three colors (color image). You can use words, but this is not a mandatory condition;

- The branches must reproduce emotions and rhythm; be zigzag, wavy, and “alive”; of different thicknesses;
- You can put the branches that have grown into the contours to have the least intersection with neighboring branches;
- The length of the line should be equal to the length of the word, which will save space and simplify the work;
- It is important to place words not in parallelepipeds and rhombuses but on branches, etc.;
- Symbols and words that are connected to each other should be connected with a dotted line;
- You need to write as clearly and clearly as possible in printed letters;
- In real interactive online mental maps, keywords are used: one word per branch: not a sentence, not a phrase, but one keyword. New ideas are generated by writing words separately, and each word gives rise to thousands of possible associations;
- It is necessary to vary the thickness of the lines and the size of the letters depending on the significance of the keyword;
- It is necessary to often use graphic symbols and drawings, thanks to which attitudes and emotions are added, emphasizing certain aspects. A mental map can consist only of drawings;
- It is necessary that the branches are not placed too densely, and at the same time, there is no space left so that it does not. For a large topic of a mental map, you should use a sheet of paper in A3 format, and for a small one, use a sheet of paper in A4 format;
- For more convenient work with a mental map, it is better to place the sheet of paper horizontally (Shcherbatiuk, 2020).

Let's name the advantages of a mental map as an innovative tool in the training of specialists in the modern educational environment of higher education. Let's consider the advantages of a mental map as an innovative tool in the training of specialists in the modern educational environment of higher education:

- The principle of creating a mind map is useful for summarizing any discipline during lessons. All information on the educational topic is transformed into associative connections of educational concepts, and the generalization of data on the topic is displayed in a single image;
- When taking notes on large topics, you can build a mental map – instead of spending time writing down materials and long notes, the student forms only one flowchart;
- A mental map helps in implementing the principle of clarity – one of the most important principles of pedagogy and allows, like a flowchart, to cover everything at a glance, to show everything most important in associative connections and comparisons;
- The mental mapping method allows students to develop creative thinking;
- Using a mental map helps to increase students' concentration;
- A mental map develops skills and logic, increases the intensity and quality of learning, and trains memory;
- With the help of mental maps and their graphic appeal, the process of generating ideas becomes more effective and faster (Hyria, 2022);
- Mental map ensures the quality of education, helps to increase student motivation and competitiveness in the labor market;
- Mental map promotes the activation of student activity, the development of emotional intelligence, communication, and the organization of interaction between higher education students in group work;
- When determining social, personal, or professional goals, making a certain decision, and determining the student's life values – promotes self-analysis and reflection;
- Ensures the creation of an atmosphere of productive dialogue and relaxed communication (Sydoruk, 2020).

7. The experimental research.

The experimental work was carried out without violating the structure of classes in the conditions of the current educational process of higher education and the content of the curriculum provided for by the curricula. The main base for experimenting was higher education institutions.

In the process of the ascertaining experiment, the CG and EG of students were determined, and the levels of readiness of future specialists for the development and application of mental maps as an innovative tool in the modern educational environment of higher education were studied. In this case, experimental research

methods were used: observation, questionnaires, interviews, and surveys.

The ascertaining stage of the study was carried out in the modern realities of higher education to develop a diagnostic apparatus, identify the state of the problem under study, and determine its pedagogical feasibility and relevance, the formation of students' independent work. First-year undergraduate students participated in the ascertaining stage of the study.

At the ascertaining stage, a question was proposed to clarify the feasibility of using and the ability to use mental maps as an innovative tool in the training of specialists in the modern educational environment of higher education.

The question was proposed: "How do you understand mental maps? Explain the different positions of considering a mental map," which caused difficulties for the respondents of the EG and CG.

Thus, only 12% of the surveyed first-year students were able to reveal the essence of this concept and the different positions of considering a mental map.

The answers of higher education applicants to the question "Name the cloud services that can be used in the process of developing mental maps when preparing seminar or lecture classes?" demonstrated ignorance of these cloud services.

Thus, only 15% of students understood this question and named the online applications Google and MindMeister, which are designed for creating mental maps and have a free tariff plan.

At the same time, 85% of respondents noted that they listen attentively and remember and record lectures from the teacher.

Only 15% of higher education applicants use the mental map method, the thesis method, and the schematic method among the lecture note-taking methods in their studies.

Answers to the final last question "Is it necessary for students to use mental maps in professional training in the modern educational environment of higher education and to introduce a special course for high-quality training?"

Thus, 78% of respondents stated the need to use mental maps in professional training in the modern educational environment of higher education and to introduce a special course on this problem: "The use of mental maps in professional training of students in the modern educational environment of higher education for high-quality training".

22% of respondents believe that such a special course is not needed but confirmed the importance of using mental maps in professional training.

Despite the relevance of this problem for education, the majority of respondents (62%) were found to have elementary and reproductive levels of awareness of this problem.

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At the ascertaining stage, a question was proposed to clarify the feasibility of using and the ability to use mental maps as an innovative tool in the training of specialists in the modern educational environment of higher education. The results obtained indicate that university students were not prepared to work with mental maps in professional training in the modern educational environment of higher education for high-quality learning, that is, students who had recently entered the university did not have practical skills in working with mental maps, did not know cloud services that can be used in the process of developing mental maps in the preparation of seminar or lecture classes; could not name the types of mental maps in the modern educational environment of higher education, did not know the rules for creating and the advantages of a mental map.

The role of the teacher, in this case, was to assist students in working with mental maps, formulating the correct question for the teacher, and using cloud services that can be used in the process of developing mental maps when preparing seminars or lectures.

So, it can be said that while studying in a general education school, future students have low-level skills in working with mental maps.

At the formative stage of the experiment, pedagogical conditions were introduced, and a special course "The use of mental maps in the professional training of students in the modern educational environment of higher education for high-quality learning" was developed, which was introduced in the EG, and the CG studied according to the usual methodology.

The identified pedagogical conditions that were implemented at the formative stage of the experimental study were as follows: activation of students' cognitive activity as a basic pedagogical condition for forming the ability to use mental maps in classroom and independent work, use of formative assessment of the use of mental maps as a determining condition for the educational activity of future specialists, personalization of learning as a dominant condition for the use of mental maps in higher education.

Pedagogical conditions were experimentally integrated in the first year of undergraduate studies into the educational process of higher education. To create mental maps, students used the method of collecting ideas and thoughts or brainstorming, etc.

48 EG students and 46 CG students participated in the experiment, which corresponds to the calculation data because the sufficient sample size is 43.

Therefore, the analysis of the results shows that at the beginning of the formative stage of the experiment, EG and EG did not have significant differences in the levels of understanding of the essence of using mental maps in higher education.

At the end of the formative experiment, a control section and statistical analysis of the level of use of mental maps by EG and CG students were carried out.

According to the results of the study, to implement pedagogical conditions in the process of implementing a special course, we observed the effectiveness of the introduced approaches, methods, types of work, and forms. Thus, EG respondents showed a significantly higher level of success, working independently with mental maps and completing individual tasks.

Comparison of EG and CG by levels of creation and use of mental maps shows a significant percentage difference when distributing students between EG and CG.

By motivational criterion (Fig. 2):

- In EG, 0% of respondents with elementary level, 8% – with reproductive level, 76% – with productive level, 16% – with creative level;
- In CG, 34% of respondents with elementary level, 21% – with reproductive level, 41% – with productive level, and 4% – with creative level.

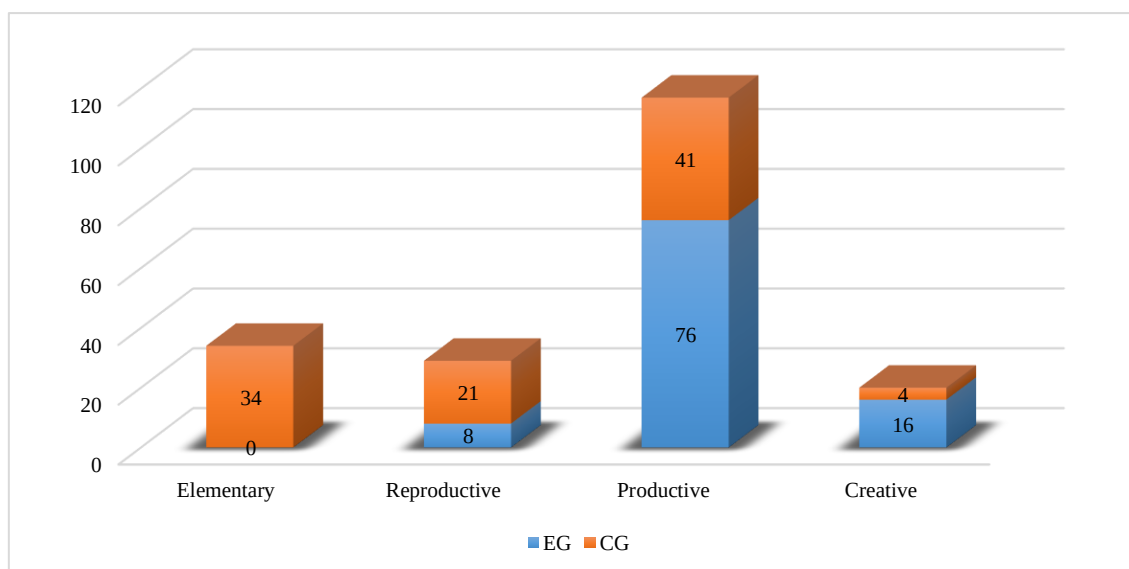


Figure 2. Comparison of EG and CG by Levels of Motivation.

By cognitive criterion (Fig. 3):

- In EG, 24% of respondents with reproductive level, 59% – with productive level, 16% – with creative level;
- In CG, 56% of respondents with elementary level, 39% – with reproductive level, and 5% – with productive level.

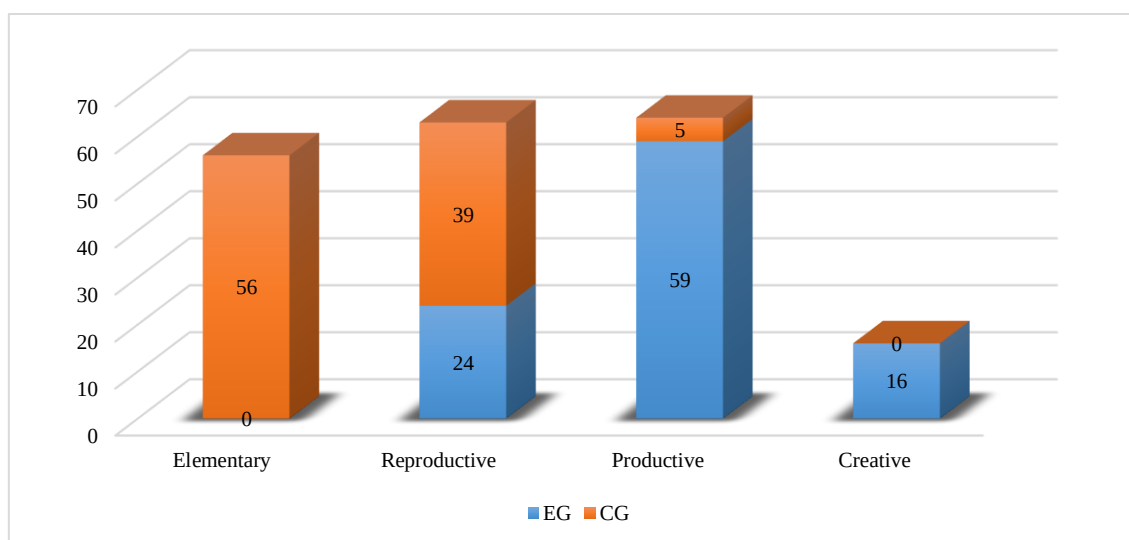


Figure 3. Cognitive Level Distribution in EG and CG.

By activity criterion (Fig. 4):

- In the EG, 16% of respondents with a reproductive level, 66% – with a productive level, 18% – with a creative level;
- In the CG, 41% of respondents with an elementary level, 54% – with a reproductive level, and 5% – with a productive level.

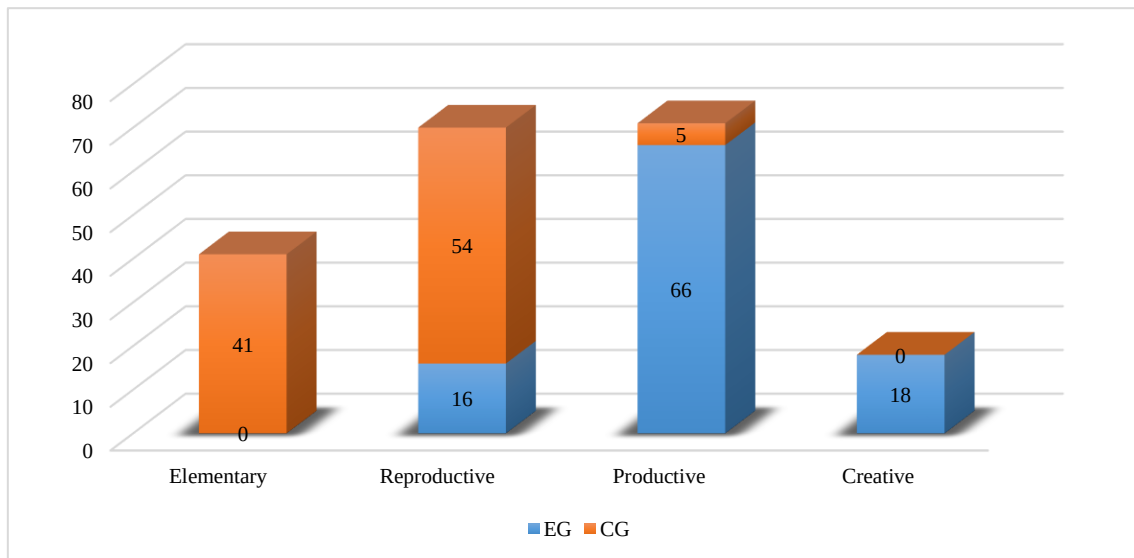


Figure 4. Distribution of Respondents by Activity Level.

By evaluation criterion (Fig. 5):

- In the EG, 40% of respondents with a reproductive level, 51% – with a productive level, 9% – with a creative level;
- In the CG, 9% of respondents with an elementary level, 80% – with a reproductive level, and 11% – with a productive level.

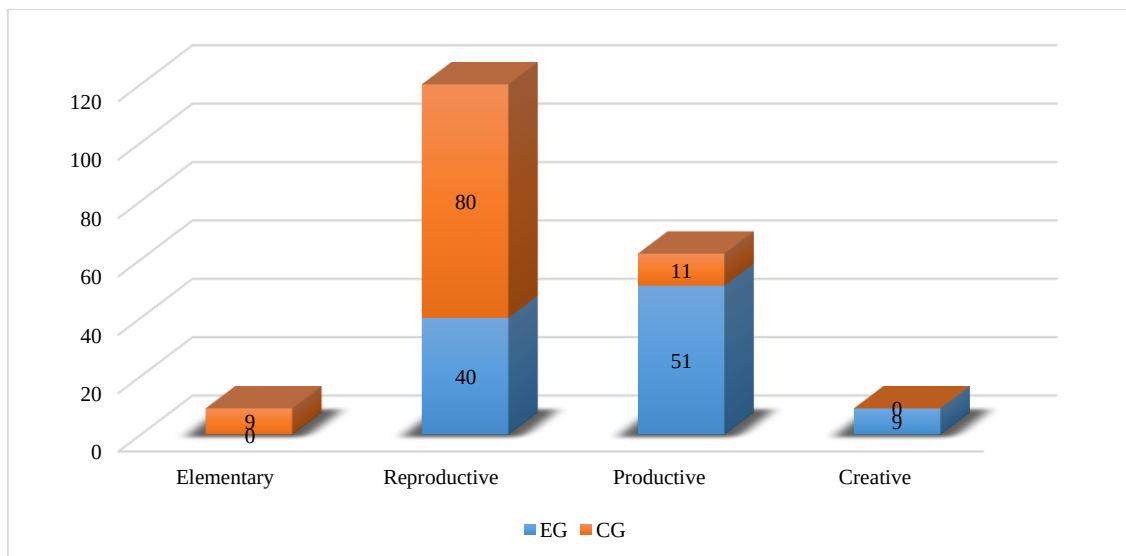


Figure 5. Distribution of Respondents by Evaluation Criterion.

So, thanks to the implementation of pedagogical conditions in the process of introducing a special course in the EG, we observed the effectiveness of the introduced approaches, methods, types of work, and forms. Thus, the EG respondents showed a significantly higher level of success, working independently with mental maps and completing individual tasks. We observe that students have a desire to continuously learn both online and offline; the desire to use digital technologies has increased; interest in education has increased; research, critical, project thinking has been formed; a culture of joint activity and the ability to build individual educational trajectories have developed; experience of mutual assessment and self-assessment has been formed; interest has arisen in involving mental maps as a tool when studying in higher education, which helped students take responsibility for the process of acquiring skills and abilities, and develop effective learning strategies throughout their lives.

A comparison of quantitative and qualitative analyses of the experimental results indicates that the implementation of pedagogical conditions in the process of introducing a special course in EG according to the components of the diagnostic apparatus led to statistically significant changes, an increase in scores on motivational, cognitive, activity and evaluation criteria, and therefore we observe positive dynamics in the use of mental maps by higher education applicants and their positive impact on the process of training specialists in the modern educational environment of higher education. As a result of the experiment, a non-parametric method of testing statistical hypotheses was used to verify the reliability of the conclusions – the Wilcoxon test. The processing of experimental data allowed us to verify the application of statistical methods and obtain confirmation of the correctness of the research methodology and the achievement of the set goal.

Discussion of the results of the work already done by scientists from different countries (disclosure by scientists of the essence and features of the use of mental maps in the modern educational space, characterization of the main areas of cooperation of educational institutions, etc.) required further development. Therefore, comparing the results of already conducted studies and analyzing their consequences, we set the goal of proving the effectiveness of the mental map as an innovative tool for training specialists in the modern educational environment of higher education. To this end, we developed a diagnostic apparatus, identifying the state of the problem under study determining its pedagogical feasibility and relevance, and forming students' independent work. The results of the formative stage of the experiment proved the effectiveness and feasibility of the developed methodology, to effectively use the mental map as an innovative tool for training specialists in the modern educational environment of higher education.

Research limitations.

The experimental study was developed in the conditions of a real educational process and was implemented during the 2022–2024 academic years. The experimental study covered higher education applicants (1st–2nd year students of higher education institutions) – 94 respondents at the ascertaining and formative stages of the study.

Future research directions.

We consider the prospect of further research to be the disclosure of the possibilities of other innovative technologies that can be used in the process of training future specialists and the formation of their social competence.

The use of mental maps in cloud services allows for mutually complementary activities of the teacher and students, resulting in the most complete awareness of a specific topic by the subjects of educational activity. The next area of scientific exploration on the presented problem is the analysis of the effectiveness of mental maps in the planning and reporting of students studying remotely.

Conclusions

We have revealed the content and considered the mental map from the perspective of innovative training of specialists in the modern educational environment of higher education. Different positions of considering the mental map as an innovative tool in training specialists are shown. Cloud services are presented that can be used in the process of developing mental maps when preparing seminar or lecture classes, and types of mental maps in the modern educational environment of higher education are distinguished. The use of online resources is proposed when creating interactive mental maps online. The rules for creating them are developed, and the advantages of a mental map as an innovative tool in the training of specialists in the modern educational environment of higher education are shown.

The experimental work was carried out without violating the structure of classes in the conditions of the current educational process of higher education and the content of the curriculum provided for by the curricula. The main base for the experiment was higher education institutions.

In the process of the ascertaining experiment, the CG and EG of students were determined, and the levels of readiness of future specialists to develop and use mental maps as an innovative tool in the modern

educational environment of higher education were studied. In this case, experimental research methods were used: observation, questionnaires, interviews, and surveys.

The ascertaining stage of the study was carried out in the modern realities of higher education to develop a diagnostic apparatus, identify the state of the problem under study, and determine its pedagogical feasibility and relevance, the formation of students' independent work. First-year undergraduate students participated in the ascertaining stage of the study.

At the ascertaining stage, questions were proposed to clarify the feasibility of using and the ability to use mental maps as an innovative tool in the training of specialists in the modern educational environment of higher education. The results obtained indicate that university students were not prepared to work with mental maps during professional training in a modern educational environment of higher education for high-quality learning, that is, students who had recently entered the university did not have practical skills in working with mental maps, did not know cloud services that can be used in the process of developing mental maps when preparing seminar or lecture classes; could not name the types of mental maps in a modern educational environment of higher education, did not know the rules for creating and the advantages of a mental map.

At the formative stage of the experiment, pedagogical conditions were introduced, and a special course "Using mental maps during the professional training of students in a modern educational environment of higher education for high-quality learning" was developed, which was introduced in the EG, and the CG studied according to the usual methodology.

The experiment was attended by 48 EG students and 46 CG students, which corresponds to the calculation data since the sufficient sample size is 43.

A comparison of the quantitative and qualitative analyses of the experiment results indicates that the implementation of pedagogical conditions in the process of introducing a special course in EG according to the components of the diagnostic apparatus led to statistically significant changes, an increase in scores on motivational, cognitive, activity and evaluation criteria, and therefore we observe positive dynamics in the use of mental maps by higher education applicants and their positive impact on the process of training specialists in the modern educational environment of higher education.

As a result of the experiment, a non-parametric method of testing statistical hypotheses was used to verify the reliability of the conclusions – the Wilcoxon criterion. The processing of experimental data allowed us to verify the application of statistical methods and obtain confirmation of the correctness of the research methodology and the achievement of the set goal.

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We consider the prospect of further research to be the disclosure of the possibilities of other innovative technologies that can be used in the process of training future specialists and the formation of their social competence. We see prospects for further research in analyzing the effectiveness of using mental maps when performing tasks by high school students in distance learning environments.

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Vital security: Rethinking human security in the context of hybrid peace

Вітальна безпека: Переосмислення безпеки людини в контексті гібридного миру

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Abstract

The study's relevance is determined by the fact that in the 21st century, the problem of ensuring the safe existence of a person has not only retained its acuteness but has also become significantly more relevant due to new challenges, dangers and threats that are becoming global. The international community and individual nation-states have yet to develop sufficient answers to these dangers. Ensuring the individual's security (vital security) about the advent of new hazards and threats to his or her essential interests entails the search for innovative ways. The study aims to systematise knowledge in personal security and to conceptualise effective measures to ensure it in the era of hybridity. The study results in formulating a vision of vital security (human security) in today's era of hybridity, particularly hybrid peace. The study's novelty is the proposed LEGO model of the "pyramid" of vital security. The LEGO model pyramid is built according to the principle similar to Maslow's pyramid but with levels of not rigid nature, which can be supplemented and rearranged according to specific (local) conditions of security landscape and security perceptions. Realist and neo-realist concepts of liberal peace have their gaps and weaknesses in the interpretation of vital security, and there is an urgent need to improve the human security paradigm, considering local specifics caused by the conditions of hybrid peace, which implies a constant state of change and reflects multi-level and multi-problematic

Анотація

Актуальність дослідження визначається тим, що у XXI столітті проблема забезпечення безпечного існування людини не лише не втратила своєї гостроти, а й значно актуалізувалася через нові виклики, небезпеки та загрози, які набувають глобального характеру. Міжнародне співтовариство та окремі національні держави ще не виробили достатніх відповідей на ці небезпеки. Забезпечення безпеки особистості (вітальної безпеки) щодо появи нових небезпек і загроз її життєво важливим інтересам потребує пошуку інноваційних шляхів. Метою дослідження є систематизація знань у сфері особистої безпеки та концептуалізація ефективних заходів для її забезпечення в епоху гібридності. Результатом дослідження є формулювання бачення вітальної безпеки (безпеки людини) в сучасну епоху гібридності, зокрема гібридного миру. Новизна дослідження полягає у запропонованій LEGO-моделі "піраміди" вітальної безпеки. Реалістичні та неореалістичні концепції ліберального миру мають свої прогалини та слабкі місця в інтерпретації вітальної безпеки, існує нагальна потреба в удосконаленні парадигми безпеки людини з урахуванням локальної специфіки, зумовленої умовами гібридного миру, що передбачає постійний стан змін і відображає багаторівневу та багатопроblemну співпрацю та конкуренцію. Показано, що замість статичності, притаманної попереднім епохам, сьогоднішній

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cooperation and competition. It is shown that, instead of static-type model, inherent in previous eras, today world of hybrid peace actually represents a model of constant dynamism when all factors interact, distorting the activities of others. Human security in the era of hybridity is thus a flexible and multidimensional entity, and paradigm of its essence and functioning should be improved continuously based on Agile and systemic vision.

Keywords: human security, vital security, vital potential, armed conflict, hybrid peace.

світ гібридного миру фактично являє собою модель постійного динамізму, коли всі фактори взаємодіють, спотворюючи діяльність інших. Таким чином, людська безпека в епоху гібридності є гнучкою та багатовимірною сутністю, і парадигма її сутності та функціонування має постійно вдосконалюватися на основі гнучкого та системного бачення.

Ключові слова: безпека людини, безпека життєдіяльності, життєвий потенціал, збройний конфлікт, гібридний мир.

Introduction

Hybrid threats have become one of the modern challenges to the national security of any state. They reflect significant changes in the nature of international security. In particular, some concepts of hybrid warfare include extensive non-military instruments. Modern warfare to a significant extent is moving from the real world to the virtual world - cyberspace, where a real confrontation between superpowers is unfolding; moreover, war from a purely physical phenomenon is increasingly moving into the spiritual and ideological plane, when modern technologies are used to control mass consciousness. Finally, the global financial and especially banking sectors provide serious economic levers of influence on the states. In addition, hybrid warfare involves the integration of various real and virtual threats (diplomatic, military, economic, informational, etc.) in order to exert psychological influence on the victim state, immerse it in a situation of uncertainty, weaken and destroy it without declaring war, as well as to create an appropriate information field around it, designed to form in the world community such an image of this state that would justify any unfriendly and even aggressive actions against it (Borch & Heier, 2024). It should also be noted that today soft power is being transformed into more latent forms, posing a real and much more significant threat to the national security of the states that are the objects of this power.

In modern conditions, the world is in search of a security system that should provide protection from new threats and challenges in the spheres of democracy, economics, culture, ecology, information, etc. Despite years of upward development achievement, new statistics and research reveal that people's perception of safety and security remains poor in practically every country, including the wealthiest ones (United Nations Development Programme, 2022). According to recent studies, since 2020, the danger to human security has significantly increased in 43 nations, exposing populations to violence from both state and non-state actors. In the first quarter of 2023, indexes measuring government stability, civil unrest, and conflict intensity showed political risk at a five-year high (Middleton, 2023). Conflicts have been increasing globally, with no region being unaffected, following a decrease in the 1990s and early 2000s. Transnational criminal activity is becoming a bigger factor in these confrontations, which frequently include many sides. Some have persisted for decades, while others have not been addressed by the global community. However, they come at a huge cost, and civilians typically bear the brunt of it. War in Ukraine, involving many stakeholders in its orbit, China's policy of 'aggressive soft power', expanding conflict landscape in the Middle East, as well as climate change, internal political instability in a number of states - all these represent far not full 'array' of contemporary threat to vital security. At the same time, the existing theory and modern states' policies to ensure the security of the individual lack adequate scientific and methodological approaches to defining and protecting the vital interests of the individual, analysing the threats and dangers that affect a person.

Meanwhile, the importance of developing comprehensive strategic approaches aimed primarily at identifying vulnerabilities, as well as including human security as the basis of the entire security system and countering hybrid threats, is obvious. Today, critical research covers non-traditional security theories (Dadwal, 2015). New views on security are based on a departure from the traditional military aspect of security. In modern democracies, the concept of "human security" is increasingly gaining momentum. In essence, this is a kind of transition from a very narrow to a broad understanding of security. At the centre of the new concept of security, there is not the state, but the individual. And while

in the past it was believed that thanks to security at the state level, it is possible to guarantee the security of the individual, today this pyramid is turning upside down (McIntosh & Hunter, 2017).

Since the mid-1990s, the concept of human helplessness has been featured in almost all theoretical discussions of the modern approach to security as one of the most pressing issues. Today, after three decades, human security has become a key factor considered in almost all professional and academic works worldwide, based on the well-known position that security is a basic human need, a fundamental human value, and almost guaranteed security. This has become critical in maintaining local, community, regional, and global security. Today, almost no national defence strategy does not pay special attention to human security.

Vital security (human security) has created an extraordinary wave in the epistemological community of international relations in recent decades. Considering the interconnected problems of underdevelopment and human rights, human security expands the scientific approach to include dangers beyond military security by referring to people and their security as a model of IR (Vejnović & Obrenović, 2023). With its emphasis on interstate security rivalry, this perspective constitutes a forceful opposition to the prevailing hegemony-based paradigms within realism and neo-realism. Nonetheless, disagreements exist on this new paradigm's normative character and issues of analysis and explication. Human security professes to give an analytical framework for investigating and explaining security challenges, but it also claims to be a practical guidance that can be applied to foreign policy. This political tendency puts the developing human security paradigm vulnerable to critique from opposing schools of international relations thought.

At the same time, no single definition of human security is observed. UN agencies (Muguruza, 2007), governments, the private sector, non-governmental organisations and academia have all contributed to developing a universal understanding of human security. However, developing a universally accepted definition of personal security has not yet been possible, often leading to its expansive interpretation. It raises the problem of the legitimacy of external intervention and complicates the practice of this area. It was named a new theory or concept, an analysis starting point, a worldview, a political agenda, or a policy framework in the literature on international relations and development. The definition of human security is still up for debate. However, its proponents agree that the focus must be shifted from a state-centered approach to security to a people-centred approach and that worries about the security of state borders should be replaced by worries about the security of the people who live there (Vejnović & Obrenović, 2023).

"The absence of insecurity and threats" is the most basic definition of security. To be secure is to be free from need (food, employment, and health) as well as fear (physical, sexual, or psychological abuse, persecution, or death). Therefore, detecting dangers, avoiding them wherever feasible, and lessening their impacts when they occur are all part of human security. It implies assisting victims in overcoming the consequences of widespread instability brought on by armed conflict, abuses of human rights, and underdevelopment (Tadjbakhsh, 2005). This enlarged definition of "security" incorporates two ideas: one is the concept of "safety" that extends beyond traditional physical security, and the other is the idea that livelihoods should be protected by "social protection" against unforeseen disruptions.

Following the conclusion of the post-Cold War era, empirical research served as the foundation for the development of the notion of human security. Numerous instances of nations turning into insecure actors, neglecting their duties to their citizens, and endangering their existence have eroded respect for sovereignty. In addition, this century has characterised several relatively recent and frequently fruitless foreign operations in Kosovo, Bosnia, East Timor, and Afghanistan. More recently, new hotbeds of geopolitical tension and war have been added to this spectrum of conflicts: the war in Syria, the Russian-Ukrainian war (both in its hybrid stage since 2014 and in full-scale war since 2022), and the war between Israel and Hamas, which has already involved Iran and Lebanon and threatens to expand to other countries in the Middle East. Data from 2018 demonstrate the critical increase in internal and internationalised internal (i.e., essentially hybrid) conflicts since the end of World War II, despite the creation of the UN and the adoption of international humanitarian law (Figure 1).

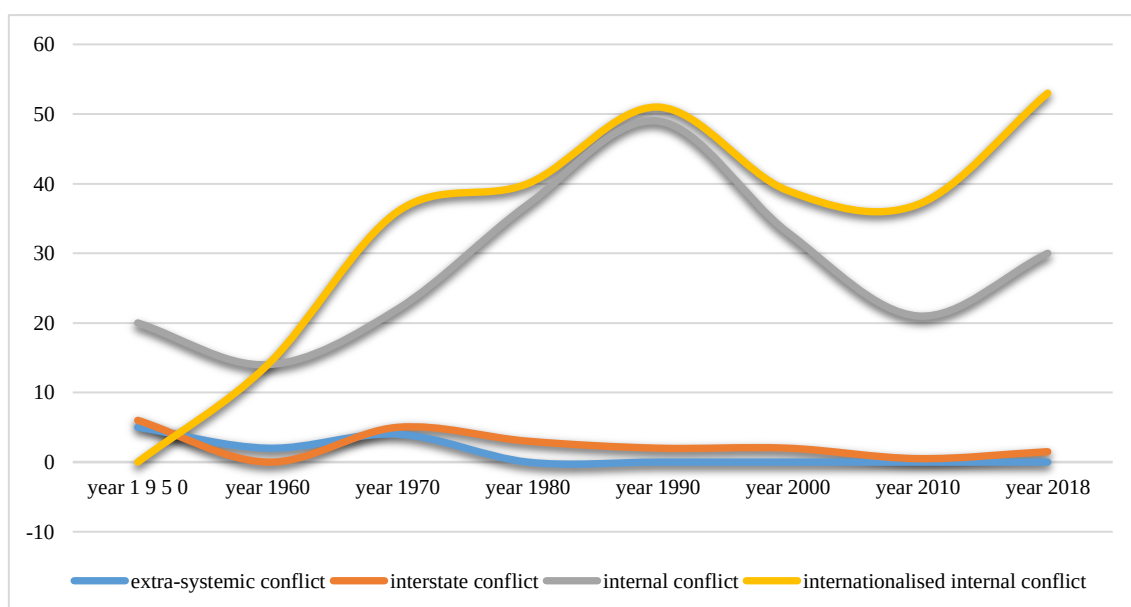


Figure 1. Number of conflicts by type, 1945-2018

Source: (Khan et al., 2021)

* An internal conflict is considered internationalised if one or more third-party governments send their combat personnel to support the aims of either side

The number of conflict-related deaths increased by 45% in the year before Russia invaded Ukraine, with more than 100,000 deaths recorded in 2021. Violence escalated considerably in Mali, Ethiopia, Myanmar, and Ukraine. Thus, 2022 became the deadliest year of armed conflict since the 1994 genocide in Rwanda, as well as the worst year in the history of the Global Peace Index (Vision of Humanity, 2023).

Increased geopolitical competition is fuelling conflicts in many countries. Large and medium-sized powers are jostling for influence in states or regions, supporting competing interests by supplying troops and weapons. Drones have also appeared to be crucial arms and played an important role in several wars—in particular, military and commercial drones were widely deployed in Ethiopia, Ukraine, and Myanmar. The overall number of drone assaults climbed by 40.8% in 2022, while the number of groups deploying drones rose by 24% (Institute for Economics & Peace, 2023).

Social crises, especially war, are like a litmus test for modern society's shortcomings and problematic aspects. In such circumstances, the course of conflicts is determined by several conditions that determine the ability to withstand challenges and threats to the national security system as a set of state institutions and non-governmental organisations that function to protect the primary goals of society, the rights and freedoms of citizens from external and internal threats and ensure the ability of each individual to morally, mentally and physically resist them in case of occurrence.

We are living through a period of transition characterised by competing conceptions of power and competing modes of security. Unlike the Cold War and the entire modern period, the combination of new wars and the war on terror undermines many of the norms and laws of war associated with traditional geopolitics, i.e. bombing schools and hospitals, assassinations from a distance, the use of poison as a weapon or beheadings and sexual slavery. It leads to large-scale forced displacement.

Against this background, the basic dimensions of vital security are undergoing significant changes, and studying these new realities is a highly urgent task for scholars and experts. The solution determines the effectiveness of policies and strategies in vital security in a landscape of rapid critical changes and unpredictable new threats both on the scale of individual states and at the regional/global level.

The theoretical, practical and political significance of rethinking the generally accepted discourse of the concept of human security in such conditions is to determine the referent of vital security, its place in the multidimensional construction of national security, and to outline the content of the concept of human security, where the object and subject of security are entirely concentrated on the person himself. This

publication aims to systematise knowledge in the field of personal security and to develop effective measures to ensure it actualises the development of vital security as a private theory.

Literature Review

Levels of human security and vital security domain

Even though there are several global indices used in attempts to define and quantify human security (such as the Failed State Index, Global Peace Index, Human Development Index, and Bertelsmann Transformation Index, to name a few), none of them, at least not yet, accurately reflect the state of human security because they are designed for different purposes. Other attempts to evaluate the state of human security throughout the world have been made (such as the Human Security Index), but they approach the problem from a different analytical angle and primarily focus on substantiating human security through an equitably increased Human Development Index.

Meanwhile, Ahmadzai (2020) rightly argues that human security is an interdisciplinary field that conceptualises security from a multidimensional perspective. Unlike other security and policy frameworks, the basic human security analysis unit is people or individuals. Human security reveals the various threats faced by people around the world. Having an objective to comprehend and mitigate these threats, human security offers various theoretical applications. It is a new paradigm which arose within the political order of the post-Cold War world.

Vital security in the overall human security landscape is generally understood as prioritising people's security, especially their wellness, safety and well-being, over the security of states (Gebre, 2015). Human security 'advocates' argue that, for example, poverty, hunger, population displacement, social exclusion, disease, and environmental degradation directly affect human security and, thus, global security (Singh, 2016). They lead to the death of far more people even than the combination of wars, genocide and terrorism. Thus, recognising that development, peace, security, and human rights are interconnected and mutually reinforcing is implicit in human security. The definition of the human security domain remains a debate between 'broad' and 'narrow' approaches to human security as if they were separate. Each approach emphasises a different "side" of human security: the broad (freedom from want) - development agenda and the narrow (freedom from fear) - human rights agenda.

Historical retrospect and philosophical foundations of human security

Human security has gained significant traction and recognition in the post-Cold War period. Over the past two decades, the basic ideas of human security as a general political orientation have gradually become mainstream in international relations.

Realist critics of human security argue that states are primarily interested in their security and generally do not care about the "fear" or "need" of others unless core national interests are at stake. Consideration of human rights plays, at best, a marginal role in the grand game of power politics in the context of international struggles for security, power and position. Consequently, since human security does not contribute to the state's national interest, it can be dismissed as an irrational and even risky adventure emanating from the sometimes idealistic human mind (Schütte & Fordelone, 2006). The growing criticism of realist conservatives within the US Republican Party of the neoconservative policies of the Bush administration, which set the promotion of liberal democracy around the world as a strategic goal, reflects this rejection of a normatively laden foreign policy aimed at spreading liberal democracy around the world: "As we wage war today to protect the world from terror, we must also work to make the world a better place for all its citizens", wrote Toft (2005). Two prominent realist scholars, J. Walt and S. Mearsheimer, took a clear stand against this understanding of American internationalism, especially against the intervention in Iraq. They argued that, while the US would almost surely win such a battle, an armed struggle with Iraq would distract resources and focus away from the more essential goal of removing the terrorist threat. In sum, the invasion of Iraq is the wrong war, in the wrong location, and at the wrong moment (Walt & Mearsheimer, 2006). This view of international relations, which is most clearly outlined in Waltz's Theory of International Politics, is based on the theoretical assumption that states have a rationally derived and objectively identifiable national interest. One can see that the realist discourse within the IR domain is primarily concerned with promoting the national interest or, in economic terms, how to maximise the state's utility.

Meanwhile, the orientation proposed by Human Security is a decisive challenge to the contemporary realism and neorealism hegemony-based paradigms. Scholars today argue that applying human security as a foreign policy position is not inconsistent with pursuing national interests but depends on different normative predispositions and the political definition of what constitutes a national interest (Hanlon & Christie, 2016). In the case of the European Union, human security, regardless of the nation-state, has already become a tacit position among European states. Therefore, refuting the alleged contradiction between the Human Security agenda and the promotion of national interests is essential.

Dimensions and 'variables' of personal security

Gasper and Gomez (2015) emphasise 'personal security' in human security thinking and practice entering into discourse as part of a failed attempt to divide security concerns into compartments. The authors examine the attention to 'personal security' in recent years, both in compartments that address organised physical (tangible) aggression or dangers to one's property and safety ('citizen security') and in broader research on threats to basic needs and rights, such as the comprehensive mapping studies conducted in different reports or research from the UNDP concerning national and regional human development, devoted to women's security. The article reflects on the challenging process of opening up traditional security thinking and practice in ways that allow complementing value and depth without being compressed into preconceived silos. Such studies open a discussion on a structure of human security and contribute to bringing clarity to vital security as its crucial layer.

Asmussen's (2014) study focuses on the impact of the 2014 Ukrainian crisis on international conflict management and human security in the context of "hybrid wars" and unrecognised states. The author analyses the peculiarities of the international community's resolution of conflicts involving multilateral actors. Human security issues are challenging to address when war takes on hybrid forms, and the main actors are unrecognised actors who are not members of international organisations. Asmussen (2014) argues that the Ukrainian crisis has led to the revival of the OSCE as the main forum for conflict resolution efforts. Mutual respect is a prerequisite for establishing a new European peace order that ensures human security. At the same time, evidence shows arising of some entropy tendencies in European security common understanding, and this fact should be also taken into account when analysing consequences of the war in Ukraine for European security landscape 'design'.

In addition, several scholars argue that environmental change can threaten global, national and human security. According to Khawas (2014), environmental challenges include managing and distributing natural resources (such as oil, minerals, and forests), land degradation issues, climate change, water quality, and quantity. These variables may directly contribute to violence or may exacerbate existing reasons, such as poverty, migration, illicit small arms, and infectious illnesses. Water shortages, natural disasters, decreased agricultural productivity, increased frequency and severity of infectious diseases, and changes in human migration are just a few of the massive physical and social changes that climate change is expected to bring about. According to Adger et al. (2021), these changes could significantly impact international security by increasing competition for natural resources, upending fragile states, and intensifying humanitarian crises. However, according to Gan (2024), managing environmental and natural resource issues can also build trust and promote peace via cooperation across tension lines. Thus, the role of security variables is not rigid and once defined, but is characterised with mutually competing vectors.

Societal layer of human security

A wide range of social issues is equally important. Scientific and technological progress may affect human security. Communities with varying access to new technology may experience "future shock" as a result of the global information society's development. Moreover, this development can create new categories of social exclusion and criminal acts such as cybercrime (Estrada-Tanck, 2016). Researchers argue that gender concerns, especially in societies based on a patriarchal paradigm where women's social position is changing, can lead to conflict. However, such issues will likely signify social development (Gilder, 2022).

Krause (2013) explores the significance of personal safety and security, which is why this area of study rightfully has a prominent position and why, since 1994, security sector reform has become a key component of many facets of foreign policy and development aid. However, he tries to go further: "Many of the issues that fall under the UNDP's or the Commission on Human Security's adopted concept of human security have thus been sidelined (e.g. health or food security)" (Krause, 2013, p. 84). Indeed, much of what

goes under the name of "human security" in the European and North American governments and international agencies he examines is focused on controlling physical violence.

Human security approaches to these risks to personal security posed challenges for existing security narratives by concentrating on individuals and allowing for more nuanced depictions of the human being, both physically and emotionally. The emphasis on the psychological and subjective makes the function of 'framing' and human biases in risk perception critical in future research, as well as insights sources that may help to open up security thinking.

An analysis by UN Women (2022) shows that human security, including health and social protection, is less likely to be a priority in conflict-affected countries. In 2019, nearly a quarter (24 per cent) of public spending in Afghanistan was on defence, with another 13 per cent going to 'public order and security'. In contrast, less than 6 per cent of public spending was directed to the health sector, about 9 per cent to education and just 4 per cent to social protection (including all programmes targeting families and children). In Burkina Faso, a country experiencing moderate conflict, the government allocated 10 times more to defence than to social protection (including all programmes marked as targeting families and children) in 2020.

NATO' vision of security.

The intrinsic interdependence of many risks and values makes it difficult to categorise security into distinctly distinct categories: "personal" vs "economic" and "health." Proper interaction with genuine human-environmental ("socio-ecological") systems necessitates fewer rigid pre-established divisions and benefits from the flexibility of human security.

Birch (2024) notes that NATO's Strategic Concept 2022 and the Human Security Guidance document reflect the new focus that the Alliance have made on strategic competition, the threat of Russian war in Europe, and a more holistic approach to security. In addition to its general outlines and guiding vision, Strategic Concept 2022 adopts several specific assessed challenges formulated in Strategic Concept 2010. The 2022 Strategic Concept reaffirms the special concern of the Alliance regarding terrorism. In particular, the Strategic Concept calls terrorism "the most direct asymmetric threat to the security of our citizens and international peace and prosperity". This attitude implies that NATO will continue to focus on an area that has piqued its interest since 9/11 and has been a source of success for the alliance.

Paillé et al. (2022) write that, for the first time, the Strategic Concept 2022 emphasises human security's critical importance, mentioning the "cross-cutting importance of investing in human security and the Women, Peace and Security agenda across all core tasks." For NATO, the approach to human security is to "integrate comprehensive population security considerations into all phases and levels of operations" to prevent and respond to risks to all people, especially in situations of conflict or crisis.

General concerns of human security

The UN and international and national civil society institutions are focused on finding the best approach to identifying the root causes of risks and vulnerabilities people face, also naturally emphasising the need to develop and implement comprehensive responses to sound sophisticated challenges in communities, countries, or regions. Research priorities are usually given to proactive prevention technologies, the creation of mechanisms for early warning of threats, minimising their impact and eliminating negative consequences. Researchers of the evolution of the human security concept have formulated many author's versions of its security discourse (Skulysh, 2023), which is based on Human Security. However, the vast majority of scientific research is devoted to a comprehensive study of the theoretical foundations and principles of building modern mechanisms to ensure human security as a capability of the state healthcare system. In contrast, the problems of a person's ability to independently build a system of natural and proactive protection against existing and future challenges and threats of a mental, informational, psychological, social and physical nature remain unaddressed.

Methodology

The study's theoretical basis is systems theory, the theory of global-local interactions, the general theory of national, international, and global security, the theory of the state, theories of dependence, theories of values

and interest, and theories of influence. The research methodology is qualitative and based on content analysis.

Qualitative nature of research is determined by the scattered essence of various human security indices and lack of objectivity of statistical data in this field due to complex and often latent influence of various factors. At the same time, in view of existing array of studies considering issues of vital human security from various angles, content analysis seems to be the optimal research tool. The choice of methodology within systems theory paradigm is determined by the complex nature and ambiguity of the object under consideration (vital human security), as well as the system emergence phenomenon among the subsystems of human security.

The methodological toolkit is formed by the technologies, principles, procedures, and research methods within the political science domain. It widely uses such approaches as comparative and retrospective, dialectical interconnection and interdependence of social phenomena, and the above-mentioned systemic approach. The retrospective approach is used to analyse the evolution of the human security paradigm after the end of the Cold War and during military conflicts of the 21st century. The comparative approach was used to analyse narrow and broad approaches to human security and outline a realist critique of Human Security. Social phenomena' dialectical interrelation and interdependence are utilised to study the nature and characteristics of hybrid threats and peace. The systematic approach is used to analyse vital security components in the hybrid peace landscape and build its pyramidal model.

The general philosophy of the research is constructivism, in which cognition is perceived not as a simple reflection of the world but as an active construction of its model by the subject.

Observing ethical principles of research is ensured, namely the absence of any influence of authors' possible biases and subjective opinions is ensured, to provide impartial analysis and ensure formulation of objective conclusions.

Results and discussion

Vital security concerns individuals' and communities' security rather than nation-state security. It integrates human rights and human development. Vital security is often seen as a 'soft' policy in security, combining physical and material security (Kaldor, 2006).

Human security analysis considers threats to realising fundamental values in people's lives. It strives to reorient the use of the prioritised concept of 'security' to ensure the basic needs of ordinary people are met. Therefore, to the question "whose security?" it answers: "Each of us and all of us". When considering the next question, "security of what?" some forms of human security analysis have become compartmentalised, trying to discuss separately "personal security", "economic security", and "environmental security". This satisfies established disciplinary and bureaucratic criteria and may be helpful. It is frequently ineffective, however. A large portion of the added value of human security analysis comes from serving as a framework for flexibly bridging these divisions according to the particular situations' nature rather than giving new formulations to topics already addressed in the frame of existing bureaucratic and disciplinary mechanisms. This is because many critical threats arise from the interrelationships between various aspects and forces in particular situations. At least occasionally, an interdisciplinary, holistic perspective is necessary to see the connections and make comparisons between "sectors" to prioritise the most pertinent threats to a particular time and place. This is because the focus on how people live and can live and the function of covering priority values and threats all require this approach.

The leading cause of fear for citizens of highly developed, industrialised nations is no longer the possibility of external assault. Instead, there are worries about organised crime, terrorism, or the acquisition of WMD by rogue states or non-state entities that support terrorism. These worries are frequently articulated in terms of immigration-related anxieties. However, border controls cannot prevent these new sources of insecurity. Instead, they must be addressed through a commitment to overcome modern conflicts, which M. Kaldor (2006) calls "new wars". The new wars represent a fusion of wars (that is, political-nature conflicts between organised groups), violations of human rights, and organised crime.

The 1945 UN Charter and previous debate streams emphasised the multiplicity and interconnectedness of core values and corresponding threats. These post-World War II concepts, inherent in the 1940s, were then

revised and rethought for the post-Cold War era, leading to the emergence of the human security discourse in the 1990s. It has often used the 1940s language of 'freedom from fear', 'freedom from want' and 'human dignity' - hence also 'freedom from outrages to dignity' - emphasising how these are interrelated. To help move beyond such broad language and support the necessary context-specific analysis, the 1994 Global Human Development Report (HDR) introduced seven dimensions of human security - economic, food, health, environment, personal, community and political - which is the subject of this collection of documents (UNDP, 1994, pp. 24-25). It is primarily a list of values, presented as a checklist for reviewing the relevant threats to these values, as the report does. For the most part, the 1994 HDR was related to recommended strategies for advancement in threat management. Many of the dangers described span numerous value domains, and all value domains impact people's lives. Other than for bureaucratic or academic convenience, there is no justification to consider any value domain separately. Indeed, the 1994 HDR did not propose a list of seven criteria as the sole or adequate basis for thinking about human security. It noted that the categories are interconnected and overlapping and do not address all important concerns.

Some categories were in the early stages of development, and there was neither time nor need to fine-tune them in the report. "Personal security" covered safety from physical violence from other crimes against life and property, as well as from accidents, abuse (including self-harm, e.g. by drugs) and neglect; "economic security" covered housing, in addition to employment and income, which could easily be a separate category; the discussion of "community security" included inter-communal conflicts, indigenous peoples; and "political security" referred to respect for "fundamental human rights", presumably referring to basic civil and political rights. At most, the list presented the myriad of relevant issues reasonably orderly, using categories that could be linked to existing policy portfolios. Most categories can be primarily adapted to existing discourses and policy portfolios, such as food, environment, health, and civil and political rights. This was less the case for 'personal security', given its broad scope and the familiar concern of existing security agencies with the security of state interests, property and the self. 'Community security' also was not adequately defined or reflected in existing portfolios, highlighting its political controversies.

Using a checklist of standard questions concerning "security" was crucial: Whose security? Who perceives security? Security of what values? Against what threats? Who provides security? To what extent? By what means?" While each category in 1994 HDR is related to human security, they do not all have equal weight. Food security and environmental (ecological) security are inputs or instruments for health and other priority values in people's lives; thus, the 1994 environmental security discussion in the WDR focused on specific distinguishing risks rather than a separate environmental values array. And because the seven areas are defined by different questions/criteria, they overlap significantly.

The word 'human security' appears more than 2,400 times in the new Routledge Handbook of Human Security by Martin and Owen (2013), but 'personal security' appears just three times; it has not been replaced by 'citizen security,' which even does not appear at all. Comparing, one can see that the other frequencies: food security 20 times, environmental security 8 times, economic security 6 times, health security 6 times, political security 6 times, community security 2 times (some comparable terms are ranked as follows: National Security 136 times; State Security - 33 times; Global Security - 16 times; Military Security 8 times). Thus, none of the 1994 list of seven titles has been adopted in the Handbook, except the older term "food security". This may be partly due to the disciplinary composition of the authors and topics selected but also to the fact that other titles are already in use; some categories (such as the least used terms "personal security" and "community security") have particular problems, and that the inclusive term "human security" better reflects the unity of human life than attempts to divide it.

Whereas thinking about human development has focused on capabilities and the ability to realise well-founded values, human security analysis looks at vulnerability, exposure to risks and adversity, and the ability to prepare for, cope with and recover from threats and harms. It complements the narrower interpretation of human development, which focuses on measuring the capacities of individuals by emphasising (un)satisfaction of basic needs, change and (instability), as well as their causes and consequences for individuals, groups and species (Ahmadzai, 2020).

Hybrid technologies, characteristic of modern aggression, interfere with social processes when certain circles try to influence society by provoking mass terrorophobia, creating distrust, hatred, and outright hostility between social groups. They substitute the natural development of social processes and systems in favour of their own, sometimes adventurous, political views.

That is why the problem of ensuring the preservation of human potential and the mental and social well-being of the nation is gaining global significance, and this task is much more complex than all those declared today in the context of national security functions. The essence of such a mission is much broader than the physical struggle against aggressors who, through violence and threats, affect the stable order of things, encroaching on the security of the individual, his or her rights and freedoms, public security and its main objects - material and spiritual values of society, state security - the constitutional order, sovereignty and territorial integrity (Chernysh et al., 2023).

Alkire (2003) contends that human beings shape human security, a vital core that must be preserved. The word "vital core" is not meant to be accurate; it refers to a minimum or essential collection of tasks relevant to survival, livelihood, and dignity. The phrase "life-sustaining core" suggests that organisations dedicated to human security cannot safeguard all aspects of human well-being. However, they will at least safeguard the centre.

The notion of a "vital core" seems to us to be the basis of vital security, one component of which is health, including mental health.

In particular, the war in Ukraine for almost three years has had a devastating impact on all aspects of people's lives, especially on their mental health. In the context of constant threat, stress and instability, cases of aggression, violence, anxiety and various mental disorders have become more frequent. The situation is challenging among residents of frontline cities/settlements who are almost on the frontline and face the realities of hostilities and their consequences daily.

War is a potent stressor that can cause a wide range of mental disorders, with the most common being stress, depression, anxiety, and somatoform disorders. People who live in conflict zones permanently and in the rest of the country during terrorist air attacks are in a state of high anxiety, which negatively affects their mental and physical health. According to the latest data, 77% of Ukrainians have recently experienced stress and severe nervousness, according to the study "Mental Health and Attitudes of Ukrainians to Psychological Assistance during the War" (Gradus Research Plus, 2024), conducted as part of the All-Ukrainian Mental Health Programme. The study showed that the primary emotions that Ukrainians are currently experiencing are fatigue, tension and stress caused by the full-scale war with Russia. According to the survey, the three most common emotions among Ukrainians are fatigue (46%), tension (44%) and hope (31%). Compared to 2023, the proportion of those who feel tension, fear, anger, irritation, powerlessness, frustration, and despair has increased.

Meanwhile, the number of citizens with a firm hope has decreased. The rate of Ukrainians who have recently experienced stress and severe nervousness remained at 77%. When assessing their mental health, 13% of Ukrainians consider it unsatisfactory, 36% - satisfactory, and 51% - at an average level (Fact, 2024). According to WHO estimates, more than 10 million people in Ukraine today need mental health support. Thousands of people need rehabilitation, which is not only a problem of the present- but also a problem for future generations (Levchenko, 2023).

The above makes it necessary to rethink general approaches to the problem of the impact of martial law on the health of the nation, recognising that reducing the problem of vital security to a specific type of-- healthcare activity is too simplistic a solution to this problem and that strategies and measures implemented under martial law have lost their effectiveness. The war has forced thousands of people to flee their homes. The process of evacuation to safer places, the loss of loved ones and the constant feeling of a possible threat carry a significant emotional burden. It provokes stress, anxiety, fear and panic, which is a complex and lengthy process to overcome, especially given the fact that the vast majority of the population was not morally prepared for this method of protecting the population in the event of a threat or emergency.

Our results actually represent a continuation of findings made by Krause (2013) and Estrada-Tanck (2016) about missing important elements in the current concepts of security. Human security concepts applied today in political discourse and scientific community represent a set of individual elements rather than a system of highly interconnected and equally important layers. At the same time, we strongly agree with the experts of Geneva Centre for Security Sector Governance (DCAF) (2024), who argue that hybrid security may be very fluid, with the roles and legitimacy of state and non-state actors moving quite often and transactionally. Our study is also in line with Adger et al.' (2021) and Gan' (2024) provisions about sequential impact and interconnection of factors influencing human security.

An analysis of the qualitative state of human potential in the country's context complicated by martial law shows the civilian population's threatening moral and psychological state and provides disappointing forecasts for the future. It is important to acknowledge that in the preceding period, insufficient attention was devoted to the establishment of a system of vital security. This encompasses organisational and technological measures for healthcare and actions to guarantee conditions for a certain level of human safety. Additionally, it includes ensuring a sense of security, which can be defined as the psychological security of the individual. This entails a conscious and responsible influence on the circumstances of life to ensure conditions for mental balance and harmonious development. The ramifications of this reductionist approach to the healthcare crisis extend beyond the considerable toll on lives and injuries sustained during armed conflicts and terrorist acts. It also leads to a profound erosion of public trust in the security apparatus, a phenomenon particularly pronounced in regions that have experienced both occupation and liberation. A society that has suffered from large-scale aggression and terrorist activity has the right to demand guarantees that the new (or modified old) model of human security is more reliable. Or, in other words, to demand from the state some guarantee that this system provides sufficient protection not only for physical but also for mental health and will provide reliable protection against destructive manipulative influences on the mind.

Syria has been in a state of chaos since March 2011. According to United Nations reports, the humanitarian crisis in Syria continues to worsen, with increasing violence and the threat of regional spread affecting the most vulnerable populations (UN, 2024). In 2024, Syria's humanitarian situation remains bleak, with 16.7 million people in need of help -, about three-quarters of the population and the most significant number since the conflict began. The ongoing combat in northern Syria, as well as recent strikes on Damascus, rural Damascus, and Homs provinces, have resulted in civilian fatalities, displacement, and substantial damage to essential infrastructure. In northeastern Syria, attacks in mid-January caused the partial or entire shutdown of hundreds of key infrastructure objects, including water supply stations, health centres, and schools. Over a million individuals were allegedly left without power. Worsened access to power, water, and cooking fuel has aggravated food insecurity and malnutrition, particularly among vulnerable segments of society, including children, pregnant women, and lactating mothers (UN, 2024).

However, one obvious danger to human security is sometimes disregarded when calculating the human cost of armed conflict: the depletion of natural resources and, more broadly, the cost of environmental degradation. Daoudi (2020) contends that under the new security system, the environment is not a freely available source of natural resources to be battled over and monetised, but rather the physical variables that shape human affairs and well-being.

The examples of Ukraine and Syria help to reconcile the theoretical provisions of human security with the realities of today, which require a paradigm shift in the understanding of vital security. Based on our research, we can depict vital security areas as follows (Figure 2).

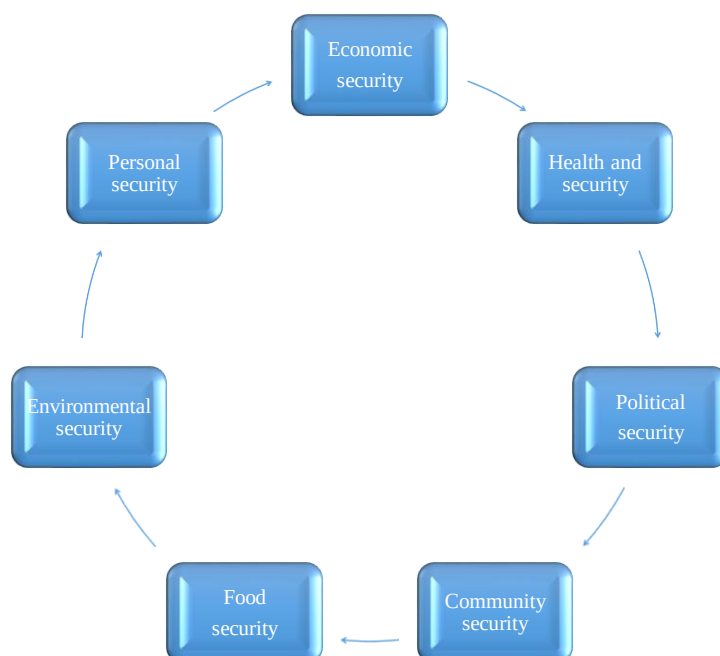


Figure 2. Areas of human security.

Source: developed by the authors

This concept refutes the realist doctrine of Schütte & Fordelone (2006) that due human security' non-contributing to the state's national interest, it can be dismissed as an irrational and even risky formation born from the sometimes idealistic human mind.

However, it is advisable to consider these areas within the paradigm of hybridity, a term that is now applied to military conflicts and peacebuilding. It is about hybrid peace (Anam, 2018). Liberal peace critics argue that any "incentives" and rewards are illusory and unevenly distributed. They claim that available liberalism has limitations since it is ultimately secularist, puts rights above needs, cannot address significant social disparities, and is connected to territorial sovereignty. They manifest scepticism about the "certainty of disciplinary liberalism" to ensure social distribution: "The poor do not benefit from policies of self-reliance and privatisation of basic needs". Importantly, however, many liberal peace advocates see liberal internationalism as a way to achieve the Millennium Development Goals. In particular, security and stability, as well as strengthening state capacity and governance, are considered prerequisites for the effective delivery of public goods and, thus, poverty reduction, education, and maternal and child health. Proponents of more emancipatory versions/elements of liberal peace try not to view the agents of liberal peace in host societies as mere recipients, supplicants and beneficiaries. Instead, they use a discourse of partnership and cooperation, in which the reciprocal relationship and incentives are not perceived as an unequal economic transaction (MacGinty, 2010).

Hybrid peace is constantly fluxing, reflecting multi-level and multi-issue cooperation and contestation. International players may not always recognise local indicators of resistance or subversion. West-based military, political, and humanitarian organisations frequently have well-developed information "antennae" with institutionalised reporting channels. However, these organisations often lack the anthropological skills necessary to recognise and decipher local patterns of behaviour, which can be subtle and passive.

A last consideration in establishing hybrid peace is the ability of local actors to promote alternate types of peace. Many civilisations have local conflict resolution and reconciliation mechanisms that rely on traditional, local, or customary norms and practices (MacGinty, 2010).

Instead of a static-type model, the hybrid peace can be presented as a model of constant dynamism when all factors interact, distorting the activities of others. The result is a maelstrom of hybridity. Different influences predominate in different situations, on various subjects, and at different periods. It is not true that there is a separate liberal peace that eventually hybridises. Instead, liberal peace is already hybridised

by the diverse context in which it lives. The conceptualisation in this model represents trying to capture and explain the process through hybridisation.

Vital security in the era of hybridity is thus a flexible and rather multidimensional entity. However, it can be represented as a pyramid similar to Maslow's. At the same time, unlike the classic Maslow pyramid, the pyramid levels are not rigid and can be supplemented and rearranged according to specific (local) conditions, like LEGO. The basic version of this pyramid is shown in Figure 3 below.



Figure 3. The vital security pyramid model.

Source: developed by the authors

It should also be noted that the essence of the problem of the security referent is to determine who implements security policy and in whose interests. The traditional approach, both in theory and practical politics, assigned the role of the security referent to the state. After all, the terrorist attack of 11 September 2001 and the subsequent period of anti-terrorist campaigns highlighted the "security paradox": the most powerful state in the world was unable to defend itself against the attack, and entire regions became dangerous as a result of anti-terrorist operations. Nevertheless, representatives of traditional paradigms believe that protecting the state is necessary for protecting the individual since, even with numerous non-governmental organisations and civil society institutions, no other entity can regularly ensure the security of society and its members. Unlike traditional concepts of security, in which social systems or groups act as a referent, the referent of vital security is the individual in all the diversity of his or her spheres of existence, and the state and social institutions play a secondary, sometimes negative role.

In the context of martial law, aggression, and transformations of social relations due to humanitarian and social disasters and revolutions, a person finds himself or herself in an exclusion zone and acquires a marginal status. Being on the border of the conflicting parties, a person loses all guaranteed rights and freedoms, as the political entities that provided them are focused on resolving geostrategic conflicts, maintaining political status, statehood or territories, distracting from social and other issues important to the population. The definition of a person as a security referent implies that he or she has mechanisms to neutralise threats, i.e. an individual must be actively involved in ensuring his or her security.

It is reasonable to propose that if healthcare, for instance, is the responsibility of the state and its associated institutions and presents a challenge to the system of governance and is instigated by its imperfections, then it is necessary to implement an effective mechanism to safeguard individuals from the potential consequences of flawed algorithms. Such consequences can have a significant impact on society. It is, therefore, essential to have a robust system in place to protect individuals from the adverse effects of these algorithms.

It is now appropriate to introduce our definition of "vital security". This implies ensuring the viability of a person, which can be defined as a systemic element of the social system that is safe from social conflicts

provoked by the mismatch between the progressive growth of social consciousness and the potential of social systems and their management algorithms (that is to say, the level of tension in relations with social regulators). In light of the above, it is necessary to distinguish between the individual's protection system as a subject of vital security and other forms of protection (Naidon et al., 2024).

Vital security can be abstractly represented as a specific social environment model. The idea of the primary constructs was formed by describing its unique subject area as part of the natural world considered within this context. The context here can be understood as the field of study of vital security, an array consisting of theories, ideas, views, beliefs, perceptions, feelings, emotions of people, and moods that reflect the nature and material life of society, the whole social relations system, in particular.

One of the primary constructs of such a model is the concept of the vital security component, structured by the conditions of functioning and levels of causal relationships, in particular, at the conceptual level; these are basic needs - of public goods and social capital, guaranteed rights and freedoms, social evolution and civilisational development, public and social order. At the functional level, these are external relations between a person and the objects and processes of the environment in all possible areas of activity (humanitarian, informational, socio-psychological, political, economic, acmeological and competence). At the basic level, these are the ways of existence and needs of a particular person or a small group, their consciousness (political, legal, moral), the responsibility of a person for their actions to society and themselves, physical and spiritual state, and viability.

The aggregate components comprise the subject area of vital security as a social process. Each component is characterised by a set of objects and processes and a certain number of actors with different views on the subject area's essence.

Vital security, therefore, is the ability of a person to withstand threats from the outside. This is the main characteristic and semantic potential of vital security. It is a tactical or practical aspect of understanding the goal that is supposed to be achieved promptly.

Degrees of hybridity can be identified by acknowledging that social processes, actors, networks, and structures are all hybridisation products. Networks, players, and structures vary in their degree of fixity. This does not imply that they will always remain unalterable. Instead, it acknowledges the existence of cultural hierarchies and places of resistance within the changing geometry of a hybridised world. Strengthening central state institutions is undoubtedly essential, but becoming the main or only focus risks further alienating them to passivity, weakening the sense of local ownership of problems and solutions.

In specific local conditions, according to the hybrid peace model, as mentioned above, vital security appears as a goal that allows for an effective response to environmental challenges while maintaining energy and mobility. The logic of survival is a strategic goal of preserving self-identity as an adequate response to the goals of hybrid aggressions and their inherent manipulative technologies on the physical, emotional, intellectual and semantic levels. Accordingly, vital potential is the ability to survive and thrive under challenging conditions, the main characteristic and semantic core of the concept of vital security.

Core limitation of the study is the lack of human/vital security discussion in regional terms and case-based approach. Although such discussion could bring more clarity to the practical aspects of vital security implementation, the scope of our study does not imply this analysis, since we set a research task to outline general vectors of paradigm shift in manifestation and understanding of human security in a hybrid peace order. Future research, however, should address this gap.

Conclusions

The scientific elaboration of the vital security issue logically follows from the modern concept of human security, which is the subject of research by many scholars and social institutions. The human security approach generates many political implications, criticisms and challenges. The idea's ambiguity, arbitrary nature, and the scope of its threat epistemology pose challenges to it. Realist and neo-realist conceptions of liberal peace have gaps and weaknesses in interpreting vital security, not considering the realities of the hybrid era that has emerged in the last three decades. All of this leads to the conclusion that the human security paradigm needs to be improved, particularly regarding protection from mental or societal dangers.

Our proposed LEGO model of the "pyramid" of vital security attempts to conceptualise human security in the era of hybridity and represents a novel approach to comprehend human security from the standpoint of vital security paradigm. The model is a flexible tool, allowing taking into account concrete local (region- and country-based) conditions, perceptions, and scope of securitization, thus contributing to understanding human security in the hybrid era. In fact, this model can become a vector of future studies within vital security in regional plane, allowing adding new levels and rearranging the structure of levels according to regional or nation-state specifics. The concrete concept and perception of national security and human security can be taken into account, as well as societal conditions, level of democracy, etc. Various cases of analysis based on this LEGO model can contribute to deeper understanding of human security and perspectives of this paradigm in today rapidly changing and turbulent world.

Furthermore, making human security the basis of international cooperation could respond to the current international debate on integrating the security and development agenda and the corresponding calls for a more coherent, effective and efficient international cooperation system.

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Crisis communication in human capital management during war: Addressing social and psychological challenges

Кризова комунікація в управлінні людським капіталом під час війни: вирішення соціальних і психологічних проблем

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Abstract

The article proves that effective crisis communications, allow not only to inform staff about the current situation promptly but also to maintain stability and cohesion in the team, quickly adapt employees to new conditions, and maintain their productivity and psycho-emotional state. The study is based on the use of a wide range of methods for assessing social and psychological threats in the context of crisis communication, namely: the results of questionnaire surveys and

Анотація

У статті доведено, що ефективні кризові комунікації дозволяють не лише оперативно інформувати персонал про поточну ситуацію, а й підтримувати стабільність та згуртованість у колективі, швидко адаптувати працівників до нових умов, підтримувати їхню продуктивність та психоемоційний стан. Дослідження базується на використанні широкого спектру методів оцінки соціально-психологічних загроз в контексті кризових комунікацій, а саме:

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sociological research by consulting agencies and international organisations to study and systematise social and psychological risks in the organisation; statistical analysis to identify the direction and dynamics of the development of the main manifestations of mental health; correlation and regression analysis to assess the impact of mental health on employees'. The development of crisis communication models in wartime is based on adapting classical crisis communication models and elements of strategic matrix modelling. The study was based on the results of surveys of employees of Ukrainian organisations for the period 2018-2023, which allowed us to determine the impact on their mental state of the biggest challenges of recent years, namely the Covid-19 pandemic and the war launched by the Russian Federation against Ukraine in February 2022.

Keywords: crisis communications, emotional states, mental health, personnel management, psychological counselling, social risks, psychological risks, education.

результатів анкетування та соціологічних досліджень консалтингових агенцій та міжнародних організацій для вивчення та систематизації соціально-психологічних ризиків в організації; статистичного аналізу для виявлення спрямованості та динаміки розвитку основних проявів психічного здоров'я; кореляційно-регресійного аналізу для оцінки впливу психічного здоров'я на діяльність працівників. Розробка моделей кризових комунікацій в умовах воєнного часу базується на адаптації класичних моделей кризових комунікацій та елементів стратегічного матричного моделювання. Дослідження ґрунтується на результатах опитувань працівників українських організацій за період 2018-2023 рр., що дозволило визначити вплив на їхній психічний стан найбільших викликів останніх років, а саме пандемії Covid-19 та війни, розпочатої Російською Федерацією проти України в лютому 2022 року.

Ключові слова: кризові комунікації, емоційні стани, психічне здоров'я, управління персоналом, психологічне консультування, соціальні ризики, психологічні ризики, навчання.

Introduction

Employees' psychological and emotional state is an essential factor in productivity, labour efficiency and the formation of the social and psychological climate in the team. In the context of rapid technological, social, and economic changes, crises, military conflicts, and growing uncertainty, which are characteristic of the current period of human development, the problems of exacerbation of social and psychological risks are becoming more acute. Effective communication is becoming a vital tool for maintaining motivation, reducing conflicts, preventing staff turnover and ensuring team stability. The study of crisis communication allows us to develop effective communication models and tools to support employees, which is critical for maintaining the productivity and resilience of organisations in crises.

The article demonstrates that effective crisis communication, as a vital tool in personnel management, not only facilitates timely updates for employees regarding the current situation but also helps maintain team stability and cohesion. It enables quick adaptation to new conditions while preserving employee productivity and emotional well-being. The study employs diverse methods to assess social and psychological risks in shaping crisis communication, including: questionnaire surveys and sociological research conducted by consulting firms and international organizations to identify and categorize socio-psychological risks within organizations; statistical analysis to track trends and developments in mental health issues among the population; and correlation-regression analysis to evaluate the influence of employee mental health on work productivity.

The development of crisis communication models during wartime involves adapting traditional crisis communication frameworks and incorporating strategic matrix modeling elements. The research is based on survey data collected from employees of Ukrainian organizations between 2018 and 2023, highlighting the impact of major challenges such as the COVID-19 pandemic and the war initiated by the Russian Federation against Ukraine in February 2022 on their working conditions.

The article aims to study the impact of mental health on employee performance and the moral and psychological climate in the team, as well as the theoretical and applied aspects of crisis communication in personnel management in the context of exacerbated social and psychological risks.

Literature Review

Many scholars have studied various aspects of communication models and the problems of forming crisis communications at enterprises. In particular, Mialkovska et al. (2023) systematised social and psychological technologies in training social sector professionals.

Internal crisis communications and the development of vertical communication strategies in an organisation are the subject of research by Ndone (2023). The researcher conducted an online experiment using a 2 (crisis response strategy: recovery vs. denial) x 2 (timing: anticipation vs. reaction to the event) design. Crisis response strategy and timing were crossed entirely, creating four experimental conditions. The researcher manipulated both the timing and the crisis response strategy that the organisation used to respond to the crisis.

Coombs (2007) considers effective crisis communication management as one of the critical components of overall crisis management and emphasises that a crisis is mainly of a perceptual nature. He notes that public opinion determines whether an event is a crisis. If stakeholders believe a company is in crisis, this is evidence of a crisis. Emphasising the importance of stakeholder and critical audience perceptions in crises, Coombs stresses the need to anticipate possible crisis scenarios and develop appropriate communication strategies. The results of the study of crisis communications are interesting from a practical point of view, as they allowed the author to systematise the basic principles of their formation in organisations. The author identifies the following fundamental principles: rapid response (to reduce uncertainty and minimise damage), transparency and accountability, empathy for the victims, planning, monitoring and feedback (Coombs, 2015).

Manipulative tactics as an element of communication and influence on public perception and behaviour are considered in the example of English-language media discourse in the work of Ukrainian scientists Mialkovska et al. (2023a). Social management and digital communications as important components of modern higher education are described in detail in the scientific work (Mialkovska et al., 2023b). The authors emphasise that in social management, communications are crucial in ensuring effective interaction between organisations, the state, civil society and individuals.

The authors identify media discourse as one form of modern communication, which includes textual and visual information created and disseminated through various media channels. Contemporary English media discourse reflects the dynamic changes in society, technology, and communication methods. Modern media stimulates user dialogue through comments, polls, and likes, allowing instant feedback. These tools for shaping crisis communications are increasingly used to influence users in the context of developing digital technologies and social networks (Mialkovska et al., 2024).

Jugo (2013) analyses all aspects and contexts of crisis communication management in corporations and provides an overview of the key elements of a crisis communication situation, from the factors that most often cause crises and the types of crisis situations that can arise in the corporate environment to the methodology for identifying target audiences and the optimal structure and content of a crisis communication plan.

Claeys & Coombs (2020) proposed a classification of crisis communication strategies based on two critical approaches: crisis response strategies and attribution of responsibility. Their classification aims to help organisations choose the appropriate strategy depending on the nature of the crisis and the level of responsibility that the audience attributes to the organisation.

Crisis communication has become an essential area of research in human resources management and public relations. Researchers Claeys & Opgenhaffen (2016) analyse the extent to which professionals and managers implement theoretical approaches in their activities during crises and also study the reasons for this gap. The results show that the main barriers to the implementation of crisis communications are individual qualities of management (leadership style, motivation, focus on analytical or intuitive tools, team relations) and external factors (image, strategy, consumer and customer behaviour, stakeholders, resource constraints).

Thus, crisis communications in human resources management should be understood as a system of measures and models aimed at effective interaction with employees in crises that may threaten the

organisation's stability or affect its reputation, functioning and morale. The conducted research shows that the role of crisis communications in the HR management of modern organisations is growing in the context of permanent crises and high dynamics of changes that affect the mental health of employees and consumers, determining their social and economic behaviour.

The study of social and psychological risks at different levels of socio-economic systems, methods of systematising the factors of such risks, and their assessment is the subject of interdisciplinary research worldwide and Ukrainian scientific thought.

Psychosocial hazards are related to imbalances in the psychosocial sphere and refer to those interactions that negatively affect workers' health through their perceptions and experiences. Psychosocial hazards cover aspects of work design, organisation and management, and their social and environmental context, which can cause psychological, social or physical harm (Roussos, 2023). Researchers consider different approaches to managing psychosocial risks in the workplace. The first approach collects sufficient information about work processes to identify existing social and psychological problems and develop adapted interventions. The second approach considers the psychological aspects that underlie these risks, usually through the prism of one of the main theories of work stress (Leka & Jain, 2011).

In most developed democracies, there is a system of state standards regulating issues related to supporting psychological health and preventing psychosocial risks in the workplace (Potter et al., 2019). The EU currently has a system of occupational health and safety standards, covering legally binding norms (including EU directives, national legislation and ILO conventions) and "soft" or voluntary standards developed by recognised national, European and international organisations. These standards exist in specifications, guidelines or agreements with social partners. However, the absence of clear definitions of certain concepts, such as "stress", "psychological stress", and "mental health", and the lack of a clear system of indicators for assessing the social and psychological state of employees reduce the effectiveness of these standards (Leka et al., 2011).

Researchers have investigated the correlations between psychological health indices and organisational profitability by the Canadian National Occupational Safety and Health Standards (Botha et al., 2024). The study's results showed significant linear relationships between the mental health of employees and organisational profitability.

Sociological surveys and statistical studies of mental health and the factors that influence it are regularly conducted by international (Senior Labour Inspectors Committee, 2012) and domestic research groups (Gradus Research, 2024). Their research has confirmed the growth of socio-economic risks in today's unstable environment, the emergence of new factors (pandemics, wars, digitalisation, globalisation, etc.), and their increasing impact on the development of socio-economic systems.

The scientific literature presents numerous models of crisis communication within organizations, including the Situational Crisis Communication Theory (SCCT) (Marynissen, 2023), the Four-Phase Model by Steven Fink (Fink, 1986), and the Adaptive Leadership Model (Pujianto et al., 2023). These models focus on selecting communication strategies both within and outside the organization, depending on the crisis level and the degree of employee involvement in discussing and resolving crisis situations.

Social-psychological challenges and risks in personnel management during the war in Ukraine have been analyzed by researchers (Chornodid et al., 2022). The researchers highlight a significant increase in social-psychological issues within teams under wartime conditions and emphasize the need for the development of targeted support programs. Scientific studies (Turianskyi et al., 2024; Karamushka, 2024). emphasize the importance of training employees in self-defense and emergency response skills, as well as establishing an efficient communication and organizational system for promptly addressing threats. Social measures, including support and psychological assistance for staff, are highlighted as critical components in ensuring safety and psychological well-being.

Methodology

The research is based on the use of a wide range of methods for assessing social and psychological threats in the context of crisis communication, namely: the results of questionnaire surveys and sociological studies by consulting agencies, specialised research and international organisations (Nations around the globe,

2023; Gradus Research, 2024; Krasina, 2023; 4Service, 2024) to systematise and assess key socio-psychological risks at different levels of organisation of socio-economic systems; statistical analysis to identify the direction and dynamics of the main manifestations of mental health of the population; correlation analysis to assess the impact of employees' mental health on their labour productivity. The study was based on the results of surveys of employees of Ukrainian organisations for the period 2018-2023, which allowed us to determine the impact on their mental state of the biggest challenges of recent years, namely the Covid-19 pandemic and the war launched by the Russian Federation against Ukraine in February 2022.

The development of crisis communication models in wartime is based on the adaptation of classical crisis communication models: Situational Crisis Communication Theory (SCCT) (Marynissen, 2023); Four-Phase Model by Steven Fink (Fink, 1986), Adaptive Leadership Model (Pujianto et al., 2023). The method of matrix modelling was used to form a model for choosing crisis communications.

The study proposes a crisis communication selection matrix that integrates socio-psychological factors with potential crisis triggers in the organization. This matrix enables the identification of not only the degree of potential internal and external crises within the organization but also the development of a detailed plan for their prevention and corresponding communication models to influence employees effectively. The matrix consists of four sectors, each combining external and internal factors of a crisis situation within the organization. These factors are calculated as weighted aggregated indicators of internal and external threats. For each of the four sectors, a strategic communication model is proposed, tailored to the severity level of internal and external crises. This model can be applied to develop and optimize the organization's personnel policy during crises.

Results and Discussion

The impact of social and psychological risks and mental health on the efficiency of socio-economic systems

There is a high probability that humanity is facing a mental health crisis in the context of current economic, political and environmental upheavals. The results of various studies already evidence this. Managers of organisations are increasingly aware that human capital is their primary resource for economic and business development, and the consequences of this crisis could be dire. Ukrainians at war may face this problem sooner than others.

In wartime conditions, socio-psychological risks become significantly more acute, including heightened stress levels, emotional exhaustion, increased anxiety and fear, reduced team cohesion, and challenges in maintaining effective communication. These factors can lead to decreased employee productivity, impaired decision-making, and a decline in overall psychological well-being, emphasizing the need for targeted interventions and support systems (Chornodid et al., 2022; Turianskyi et al., 2024; Karamushka, 2024).

In August 2023, the Alligators Digital consulting group conducted a statistical study on the impact of factors on the psychological health of the population in 11 world countries representing different continents, different socio-economic statuses, and current or past war experiences. In each country, 1,000 people were surveyed, representing different age groups (13 years and older), social strata and gender. The study identified the most sensitive external factors that affected the general stress and emotional tension of the population in Ukraine in August 2023 (Figure 1).

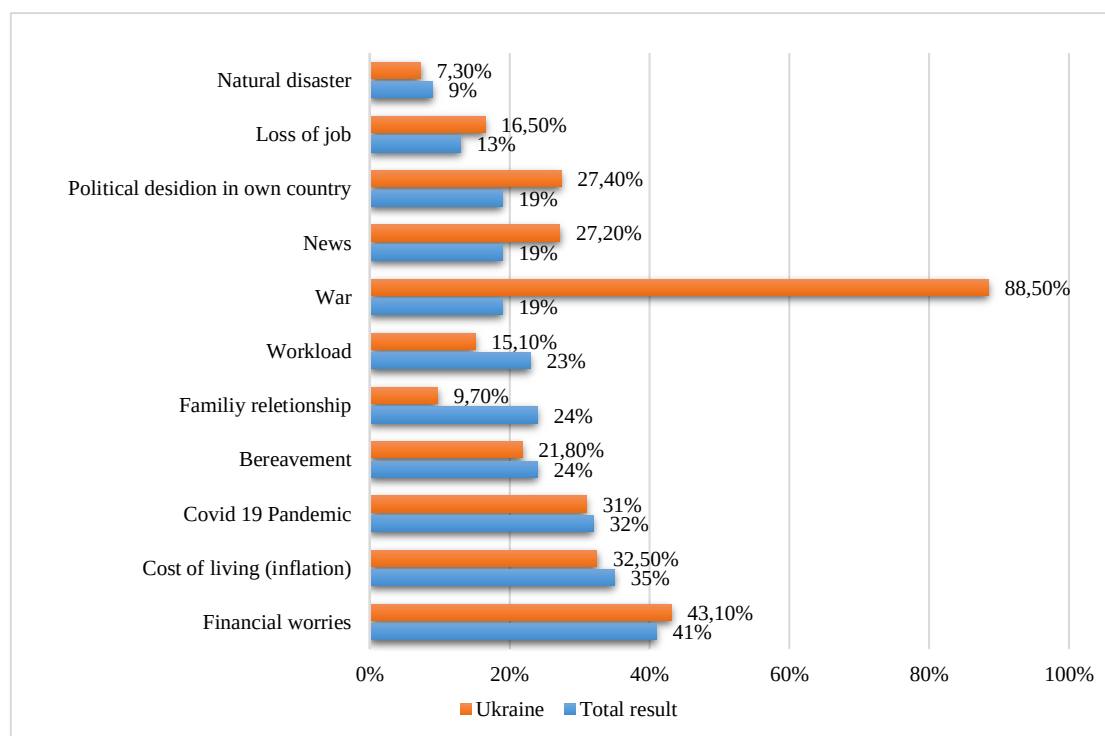


Figure 1. Influence of factors on the state of mental health of the population.

Source: The First Summit of First Ladies and Gentlemen, (Nations around the globe, 2023)

Thus, the surveys have shown that, in general, the main factors of tension and stress are primarily economic (financial situation, inflation, living standards). The Covid pandemic is also a relevant factor (19%), which was accompanied by severe restrictive measures and led to a deterioration in the psychological state and social communications of 32% of respondents. Political factors are essential; in most cases, they also affect future economic expectations (19%). The war is perceived as a factor of stress and emotional tension at 19%, but this figure varies depending on the country of residence. In particular, in Ukraine, where there is a war going on, the priority of this factor is 85%, and in Argentina, where there have been no full-scale wars for many years, this indicator affects only 3.3%. Other factors affecting mental health are family relationships, work and lack of work, climate and the environment. Studies have shown that in most cases, the psychological state of the population depends on the level of negative manifestation of these factors in a particular country and correlates with the motivational levels of Maslow's pyramid.

In Ukraine, the priorities regarding the impact of various factors in the context of war are distributed differently. The leading factor is the war (88.5% of respondents assess the war in the country as a potent stimulant of stress and constant tension), which in turn increases the impact of other factors at a level higher than the average for the countries studied, namely: financial challenges (43.1%), politics (27.4%) and news (27.2%), unemployment (16.5%). At the same time, Ukrainians pay less attention to family relationships, the state of the environment, and other factors that cause stress. Thus, in general, in times of war, Ukrainian citizens experience a higher level of stress and tension and deterioration of mental health than representatives of other countries. In crises and war, the priorities of perception shift to areas primarily dependent on survival, which should be considered when formulating enterprises' communication policy.

The conducted research shows a significant impact of psychosocial risks on the organisation and safety of work and the final results of the organisation's work, which are determined by such indicators as labour productivity, the level of achievement of goals and implementation of development strategies, the organisation's image in the market. In today's environment, characterised by significant changes in work organisation under the influence of digital and other technologies, increased dynamics of external and internal changes, and growing threats to life safety, psychosocial risks affecting mental health and occupational safety are increasing. With this in mind, social and psychological risk management is becoming one of the most critical functions of HR management.

The level of social and psychological risks depends on the field of activity. According to the European

Working Conditions Survey, some professions are particularly vulnerable to the risk of various forms of violence. In particular, in 2005, workers in such sectors as education and healthcare (14.8%), transport and communications (9.8%), and hotel and restaurant business (8.6%) reported the threat of physical violence (Senior Labour Inspectors Committee, 2012).

To assess psychosocial risks, the scientist Roussos P. L. proposed a tool for assessing social and psychological risks in an organisation called PRIWA. This tool includes 68 items to assess occupational psychosocial risks (organisational culture, job demands, job insecurity and presenteeism) and consequences (health and well-being, dysfunctional behaviour, job satisfaction and engagement), making it relatively short and easy to use. The research results based on data from 17 Greek organisations have shown that the factors of psychosocial risks, in most cases, interact with each other and, in aggregate, put pressure on employees, significantly affecting the internal climate and productivity (Roussos, 2023).

Given the importance of maintaining the psychological health of the population in times of war, Gradus Research conducted a study of the state of mental health of Ukrainians in 2022 and 2024 as part of the All-Ukrainian Mental Health Programme. The study was conducted by filling out questionnaires in the Gradus mobile application. The sample represents the population structure of cities with more than 50,000 residents aged 18 to 60 by gender, age, settlement size, and region, excluding temporarily occupied territories and active combat zones. The survey was conducted in three waves: the first wave in September 2022 (2,001 respondents), the second wave in October 2023 (2,000 respondents), and the third wave in January 2024 (2,423 respondents) (Gradus Research, 2024). According to this study, more than 77% of respondents have been experiencing constant stress and anxiety since the start of the full-scale invasion. As for the leading causes of stress, the answers were distributed as follows: a full-scale war with Russia (72%), financial difficulties (41%), the socio-political situation in the country (38%), and their health (30%). About 47% of women and 32% of men feel the need for professional psychological help, but only 8% of respondents have ever sought it. The main methods of coping with stress are surfing the Internet, watching films and TV series, and communicating with loved ones.

Thus, psychological and social risks are intensified in the context of war, which, if ignored and not paid sufficient attention to, can lead not only to a deterioration in the moral and psychological climate in social systems and a decrease in the efficiency of their development but also to threatening consequences.

In human resources management, social and psychological risks are becoming one of the leading aspects of monitoring, as they directly affect employees' efficiency, motivation and general well-being and, accordingly, affect their work efficiency. Among the main risks, scientists identify workplace stress caused by high workloads, tight deadlines and conflicts, which leads to chronic exhaustion and reduced productivity; emotional burnout, which, without proper support, can cause a sense of exhaustion and reduce engagement in work; conflicts in the team, which create a tense atmosphere and impair teamwork; insufficient social support from colleagues and management, which can cause feelings of isolation and loss of motivation, which underscores the importance of developing a corporate culture that promotes support and interaction within the team.

To assess the impact of social and psychological risks on corporate sector employees' mental health and performance, we conducted a correlation and regression analysis based on a study by the 4Service research holding. Since 2018, the company has been conducting annual surveys of employees of enterprises and organisations in Ukraine on their emotional state, cognitive symptoms experienced by employees, self-assessment of their work efficiency, and measures taken by companies to take care of employees' mental health (Krasina, 2023; 4Servis, 2024). Selected survey results from 2018 are shown in Table 1.

Table 1.

Selected results of surveys of employees of Ukrainian organisations on mental health and self-assessment of work performance

Signs of deterioration in mental health and performance, % of respondents	2018	2019	2020	2021	2022	2023	Increase
Employees who have reported problems with concentration recently x_1	31	34	46	35	51	49	18
Employees who felt passive in the performance of their duties, x_2	28	24	23	26	22	38	10
Employees who experienced depression, x_3	12	10	22	18	28	29	17
Employees who reported a deterioration in communication with colleagues, x_4	9	11	14	20	21	35	26
Employees who reported a decrease in their labour efficiency, x_5	5	8	22	13	26	23	28

Source: compiled by the authors based on data from (Krasina, 2023; 4 Servis, 2024).

The highest rates of self-assessment of stress, depression, and other mental health indicators were observed in 2020 during the Covid 19 pandemic. Administrative restrictions, the need to change formats and modes of work, and fear for their health and loved ones led to a significant deterioration in work efficiency. They negatively affected the mental health of the respondents. In 2023, there was a steady increase in symptoms indicating a deterioration in employees' work performance and mental health. Internal communications in the surveyed organisations have deteriorated during the war due to stress, tension, and divergent political opinions. Thus, the war has caused an unprecedentedly long and intense strain on the mental health of Ukrainians. In such circumstances, companies need to go beyond ad hoc support for employees and develop a systematic strategy to overcome the effects of the war on their psychological state. However, according to the survey, only 15% of companies are already taking appropriate measures, and some have plans for the future. At the same time, 45% of respondents said their organisations do not plan to implement any initiatives in this area.

The data presented in Table 2 was obtained using the MS Excel software package. The correlation between mental health and the state of internal communications in the organisation was assessed, provided that other factors are neutral.

Table 2.

Correlations between indicators of mental health deterioration, internal team communications and work efficiency

Indicators of deterioration in mental health	x_1	x_2	x_3	x_4	x_5
Employees who have reported problems with concentration recently x_1	1,00				
Employees who felt passive in the performance of their duties, x_2	0,14	1,00			
Employees who felt depressed, x_3	0,94	0,32	1,00		
Employees who reported a deterioration in communication with colleagues, x_4	0,67	0,71	0,82	1,00	
Employees who reported a decrease in their labour efficiency, x_5	0,98	0,07	0,95	0,66	1,00

Source: calculated by the author based on Table 1

The results of the analysis showed that there are close correlations between the factors studied, in particular: in particular, feelings of depression can be both a factor and a consequence of reduced concentration (0.94) and work efficiency (0.95); passivity in the performance of work duties causes conflicts in the team (0.77).

Problems with concentrating on work issues, which are most often caused by external stressful situations, lead to poor communication (0.67) and reduced performance (0.98). Thus, mental health and well-being issues significantly impact both the effectiveness of work performance and the internal climate of the team. Studies have confirmed that in times of war and crisis, social and psychological risks in society are exacerbated, affecting health, motivation, performance, and overall quality of life. In such conditions, the role of crisis communications in HR management is growing, as it is designed to prevent and reduce social and psychological risks, prevent conflicts, reduce stress among employees, and support their productivity.

Crisis communication models as a tool for HR management in the context of modern challenges

In the classical sense, human resource management encompasses a set of strategic and operational measures aimed at the effective use of the potential of employees in an organisation. The main goal of human resources management is to create conditions under which employees can fully realise their abilities and significantly contribute to achieving the organisation's strategic goals. In times of war, this aspect of management acquires additional importance, focusing on the rational formation and use of personnel and their physical preservation and adjustment to high productivity in complex social and psychological circumstances (Kramar & Baranov, 2024).

Employee mental health is a crucial resource for commercial organisations that requires constant attention and investment. Creating a supportive work environment and promoting mental well-being can increase productivity and foster professional growth. Investing in mental health support programmes not only improves the well-being of employees but also meets the company's strategic interests, ensuring its long-term success (Halahan & Raievska, 2024).

Human resource managers need to use all available resources to minimise the devastating consequences by predicting possible crisis scenarios, developing crisis communication plans and ensuring that they are as prepared as possible for a crisis. In such situations, it is essential to be aware of the available reactive strategies that can help a company communicate effectively, reducing the negative impact on the organisation's corporate image and internal environment (Jugo, 2013).

Organisations facing a crisis often choose sub-optimal response strategies, preferring those that help to avoid short-term losses to those that provide long-term benefits. The research conducted by the authors suggests that intuitive decisions and communications prevail in crises, but only in some cases does this approach yield a positive result (Claeys & Coombs, 2020). Effective crisis communications management requires a strategic approach combining proactive and reactive actions. It is essential to prepare for potential crises in advance, create a communications plan and ensure prompt interaction with all stakeholders during a crisis.

The choice of a specific crisis communication model depends on the type of crisis, its scale, the degree of responsibility of the organisation, and the expectations and reactions of stakeholders. The following factors must be taken into account: the nature of the crisis (man-made, financial, reputational, etc.), target audiences (staff, customers, investors, the public, the media), and the speed of information dissemination.

The scientific literature presents many models of crisis communication in the organisation, including Situational Crisis Communication Theory (SCCT) (Marynissen, 2023), the Four-Phase Model by Steven Fink (Fink, 1986), the Adaptive Leadership Model (Pujianto et al., 2023). These models aim to choose a strategy for direct communication both inside and outside the organisation, depending on the level of crisis and employee involvement in discussing and resolving crisis situations. However, approaches to choosing the optimal crisis communication model depending on the crisis's specific circumstances are not sufficiently substantiated.

Studies have shown that in times of war, one of the most sensitive threats to an organisation is the socio-psychological state of employees (who are under constant emotional stress and depression) and the moral and psychological climate of the team. In this context, an essential function of HR management is to form an anti-crisis model of internal communications based on monitoring the individual mental states of employees and the internal moral and psychological climate. It is also crucial to identify and predict external factors of the crisis, which will improve the information content of communications and targeted instructions. In this context, we propose a crisis communications model that considers external and internal factors and their combination (Figure 2).

The Crisis Communication Selection Matrix combines socio-psychological factors with possible crisis factors in an organisation. It allows not only to determine the degree of possible internal and external crises in an organisation but also to develop a detailed plan for their prevention and appropriate models of communication impact on employees. The model can also be used to develop and optimise an organisation's HR policy in times of crisis. The model development involves the following steps:

1. Development of norms and criteria for assessing the team's internal psychological state and external environment risks. For example, the criteria for assessing the moral and psychological climate may include the effectiveness of teamwork, the number of conflicts and stresses in the workplace, the

effectiveness of information exchange, the occurrence of strikes, and discipline violations. The factors that have the most significant impact on the organisation's performance are ranked to assess external risks and the probability of their occurrence.

2. Methods of calculating the criticality of factors that reduce quantitative and qualitative assessment indicators to a single measurement in percentage or points. In this context, the simplest is linear normalisation by the formula:

$$X_i = \frac{x_f}{x_n} \times 100 \quad (1)$$

Where, x_i is the value of the indicator at the time of assessment;

x_f - the value of the indicator at the time of assessment;

x_n - is the normatively permissible value.

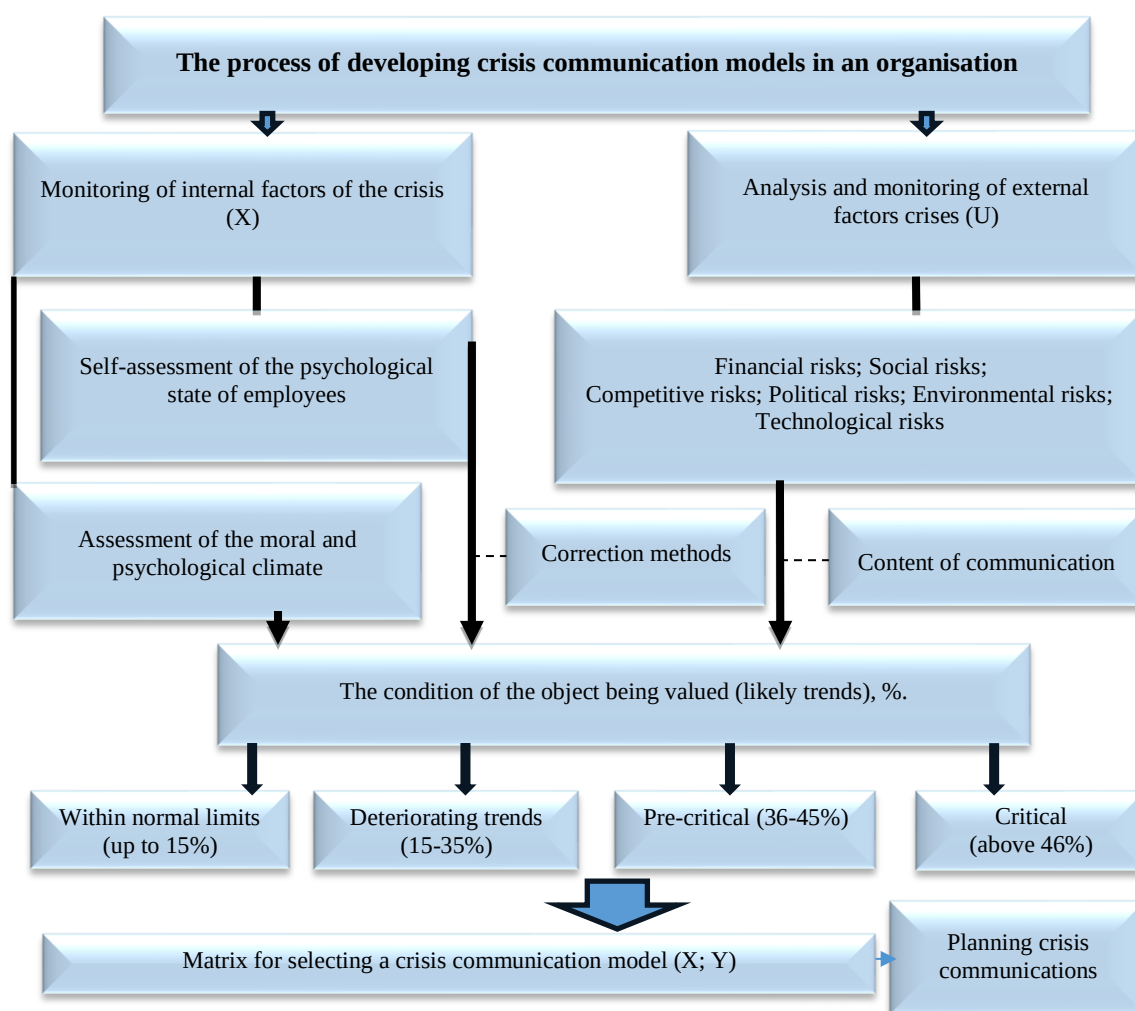
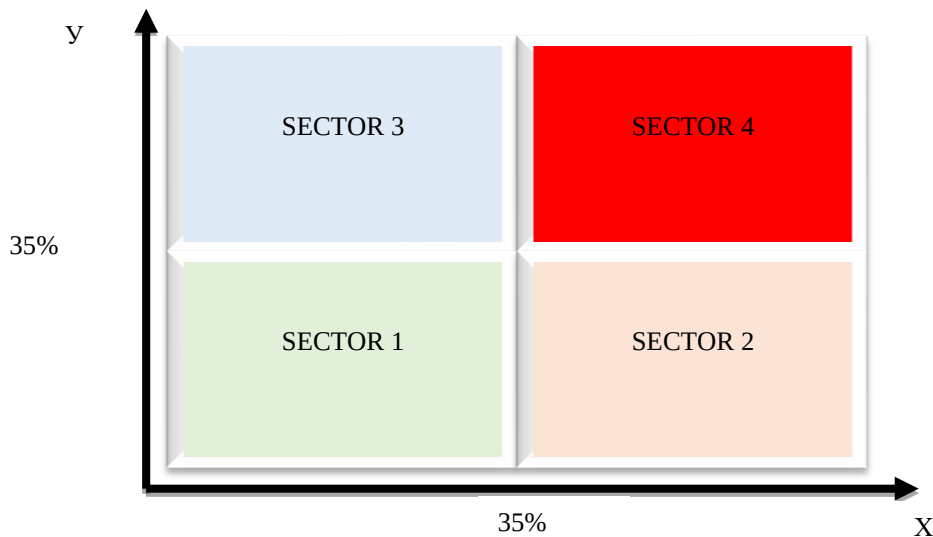


Figure 2. The process of choosing a crisis communication model.

Source: provided by the authors

3. Formation of a matrix for choosing a crisis communication model, which provides for the ratio of the assessment of the criticality of external factors of the probability of crises and internal social and psychological risks in the team. The matrix looks like this (Figure 3)



X - Internal social and psychological threats;
U- External threats of a crisis

Figure 3. Matrix for selecting a crisis communication model.

Source: provided by the authors

The matrix consists of four sectors, each of which combines external and internal factors of the crisis at the enterprise, assessed as a weighted average aggregate indicator of internal and external threats using the formula:

$$X = \sum X_i \times K \quad K \in (0,1;1) \quad (2)$$

where K is the importance coefficient of the factor.

A model of strategic communications is proposed for each sector, taking into account the level of aggravation of internal and external crises:

Sector 1. This sector is characterised by low social and psychological risks of crises shortly. For this sector, the most optimal model is preventive communication, which is focused on increasing the enterprise's productivity and preventing possible conflicts in the team and mental stress on employees. Potential crises are discussed at the highest level of management without involving staff.

Sector 2. The organisation has high social and psychological risks without significant pressure from external factors. The optimal communication model aims to resolve internal conflicts and stresses, active HR policy, provide psychological support, and improve the corporate climate.

Sector 3. High level of external pressure at the enterprise with a relatively stable internal psychological climate. Active crisis communication involves the creation of crisis management teams, active informing of the staff, and increased employee participation in decision-making.

Sector 4. There is high internal tension and social and psychological risks amid growing external threats. In such conditions, it is key to ensure ongoing dialogue, maintain trust and pay attention to the psychological state of employees. It is necessary to support staff through empathetic messages, reinforce a sense of security and trust, and encourage teamwork to overcome the crisis together. Leadership should demonstrate control over the situation by communicating the specific measures to protect the organisation. It is essential to organise anti-crisis training aimed at stress management and provide access to professional psychological support to prevent emotional burnout and maintain staff's mental health.

In Sector 2 and Sector 4, psychological counselling and emotional distress management are crucial elements of crisis communications. Psychological counselling plays a vital role in crisis communications by providing employees emotional support through individual and group counselling. Such sessions create a

safe space to discuss experiences and help reduce stress and anxiety by teaching self-regulation techniques (breathing techniques, cognitive restructuring, relaxation). Psychological training helps to improve interpersonal communication, develop conflict resolution skills, and increase the effectiveness of teamwork, even under stressful conditions.

The proposed model can be applied to shape personnel policies and manage crisis communications in Ukrainian enterprises, both during the war to alleviate the social-emotional and psychological burdens on employees, and in the post-war period to develop crisis communications aimed at supporting the adaptation of individuals who participated in the country's defense.

Conclusions

Based on the research, crisis communications are an important tool in managing an organisation's personnel. They are designed to prepare for, respond to, and eliminate the consequences of crisis situations by building effective internal and external communication models.

In the context of war and other socio-economic shocks, psychological and social risks are increasing. If ignored and not paid sufficient attention to, these risks can lead not only to a deterioration in the moral and psychological climate in social systems and a decrease in their development efficiency but also to threatening consequences. The correlation analysis has shown a high level of influence of employees' social and psychological risks and mental health on their labour efficiency and moral and psychological climate.

To optimise the process of selecting models of crisis communications at enterprises, the article offered a matrix that combines socio-psychological factors with possible factors of occurrence of crises in an organisation and allows determining not only the degree of possible internal and external crisis of an organisation but also developing a detailed plan of their prevention and corresponding models of communication impact on employees. This matrix can also be used to develop and optimise an organisation's HR policy in times of crisis. The matrix consists of four sectors, each combining external risks and internal (social and psychological) factors of the crisis at the enterprise. For each sector, a strategic communications model is proposed, which considers the level of aggravation of internal and external crises. Ukrainian organisations, under increased pressure from external threats and in the context of escalating internal social and psychological risks, are in Sector 4 and need an active HR policy aimed at supporting and providing psychological support to staff and developing effective anti-crisis adaptation strategies.

The limitations of the study primarily include the general reluctance of individuals to participate in social surveys, the lack of effective methods for assessing the socio-psychological state within teams, and the limited availability of psychological services in enterprises and organizations.

Future research will focus on developing effective models of socio-psychological adaptation for employees in the workplace who have suffered physical and psychological trauma during the war. This is a crucial condition for rebuilding the economy and improving the socio-psychological climate in the social environment.

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Musical art as a facilitator of cultural diplomacy and international relations

Музичне мистецтво як фасилітатор культурної дипломатії та міжнародних відносин

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Abstract

The article is devoted to the study of the impact of cultural diplomacy on international relations and the role of musical art in building diplomatic ties between countries. The topic's relevance is due to the growing interest in cultural diplomacy to reduce tensions and strengthen international cooperation. The article utilises comparison, synthesis, generalisation, and induction methods to analyse specific cases of musical events that have influenced the formation of positive relations between states. Using the comparison method, the article analyses various international initiatives in music diplomacy, including examples of interactions between the United States and Iran, North and South Korea, Israel, and Palestine. As a result of the study, the article identifies critical aspects of music diplomacy. The main trends and prospects of using music for cultural exchange and peacekeeping initiatives are outlined. The article examines how musical events

Анотація

Стаття присвячена дослідженню впливу культурної дипломатії на міжнародні відносини та ролі музичного мистецтва у розбудові дипломатичних зв'язків між країнами. Актуальність теми зумовлена зростаючим інтересом до культурної дипломатії як засобу зменшення напруженості та зміцнення міжнародного співробітництва. У статті використано методи порівняння, синтезу, узагальнення та індукції для аналізу конкретних випадків музичних подій, які вплинули на формування позитивних відносин між державами. За допомогою методу порівняння проаналізовано різні міжнародні ініціативи у сфері музичної дипломатії, зокрема приклади взаємодії між США та Іраном, Північною та Південною Кореєю, Ізраїлем та Палестиною. У результаті дослідження визначено критичні аспекти музичної дипломатії. Окреслено основні тенденції та перспективи

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strengthen cultural and diplomatic ties, ensuring integration and interaction at the level of the state and society. Particular attention is paid to the prospects for further use of music to resolve contemporary conflicts and potential directions for the development of cultural diplomacy on a global scale. Further research could explore new approaches to music diplomacy, developing innovative cooperation models to increase the effectiveness of international cultural initiatives.

Keywords: diplomacy, international relations, cultural interaction, musical art, national interests.

використання музики для культурного обміну та миротворчих ініціатив. Розглянуто, як музичні події зміцнюють культурні та дипломатичні зв'язки, забезпечуючи інтеграцію та взаємодію на рівні держави і суспільства. Особливу увагу приділено перспективам подальшого використання музики для вирішення сучасних конфліктів та потенційним напрямкам розвитку культурної дипломатії у глобальному масштабі. Подальші дослідження можуть бути спрямовані на вивчення нових підходів до музичної дипломатії, розробку інноваційних моделей співпраці для підвищення ефективності міжнародних культурних ініціатив.

Ключові слова: дипломатія, міжнародні відносини, культурна взаємодія, музичне мистецтво, національні інтереси.

Introduction

Music has long been recognized as a universal language capable of transcending linguistic and cultural barriers, making it a cornerstone of cultural diplomacy. As a potent tool of soft power, music fosters connections between nations by evoking shared emotional experiences, communicating symbolic meanings, and reflecting collective values. In a world marked by geopolitical tensions and socio-political complexities, music has emerged as a non-invasive yet profoundly effective means of promoting intercultural understanding and peace.

Cultural diplomacy, which encompasses the use of cultural assets like music and dance, serves as a bridge between nations, facilitating dialogue and collaboration. Its universal appeal lies in its ability to integrate diverse cultural perspectives while dissolving controversies often fueled by political and nationalistic agendas. From historical instances like the Cold War-era jazz diplomacy of the United States to contemporary events such as Eurovision, music has played a pivotal role in shaping perceptions and fostering goodwill across borders.

In artistic diplomacy, music serves not only as a means of cultural preservation but also as a strategic tool for nation branding. Festivals, concerts, and orchestral performances act as cultural showcases, highlighting a nation's heritage while fostering international connections. For instance, the Vienna Philharmonic's annual New Year's Concert garners worldwide audiences, symbolizing harmony and cultural excellence. Similarly, large-scale festivals like Glastonbury or the Montreux Jazz Festival attract global participants, offering platforms for cultural exchange and dialogue. These events promote mutual appreciation and understanding, enhancing the potential for cooperative international relations.

Cultural initiatives leveraging music have also demonstrated their efficacy in conflict resolution and post-conflict rebuilding. Programmes such as Daniel Barenboim's West-Eastern Divan Orchestra, which brings together musicians from Israel, Palestine, and other Middle Eastern countries, exemplify how music fosters dialogue, calms tensions, and lays the groundwork for long-term cooperation. These initiatives highlight music's role as a peacebuilding mechanism, capable of transforming adversarial relationships into collaborative opportunities.

The economic implications of music-based cultural diplomacy are equally significant. International music events generate employment opportunities for artists, encourage cultural investment, and boost tourism by attracting foreign audiences. For example, large-scale festivals like Tomorrowland in Belgium not only serve as cultural gatherings but also significantly contribute to local economies.

Technological advancements have further amplified the role of music in cultural diplomacy. Digital platforms now enable virtual concerts and global music festivals, extending the reach of cultural initiatives to remote regions. Initiatives like Global Citizen's virtual concert series illustrate how technology bridges physical divides, making cultural diplomacy more inclusive and accessible in an interconnected world.

This research aims to explore the role of music as a facilitator of cultural diplomacy and international relations. By analyzing historical and contemporary examples, it seeks to elucidate how music serves as a medium for intercultural dialogue, peacebuilding, and nation branding. Additionally, the study will examine the economic and technological dimensions of music's influence, providing a comprehensive understanding of its impact in the modern global context.

Literature Review

Music as a Catalyst for National Identity and Cultural Exchange

Modern scientific studies demonstrate that music plays a decisive role in shaping national identity, fostering international solidarity, and promoting shared values. Dunkel & Schiller (2022) highlighted the influence of popular music on national identity formation, emphasizing its integration into political processes essential for understanding cultural diplomacy. Similarly, Davies (2023) explored the temporal aspects of music within the international political economy, demonstrating its role in fostering empathy and facilitating rapprochement among states. Bannerman (2023) examined the "Music for Uniting the Americas" programme, illustrating its significance in promoting cultural convergence within the Western Hemisphere. Kiel's (2020) analysis of musical rivalry during the 2019 Eurovision Song Contest underscored how cultural diplomacy can strengthen international ties. Additionally, Pasler (2021) shed light on African diplomacy at the Dakar Music Festival, illustrating music's role as a medium for cultural dialogue. Prima et al. (2024) emphasized the significance of information influence in fostering social competencies, which aligns with the role of music in promoting intercultural dialogue. Similarly, Tkach et al. (2024) highlighted the importance of innovative approaches in management, reflecting how adaptive strategies in music diplomacy enhance international cooperation.

Music's importance in diplomatic initiatives has been widely noted (Idowu & Ogunnubi, 2021; Kelly, 2019; Ma'arif et al., 2022; Panasiuk et al., 2022). Liu (2021) detailed the Philadelphia Orchestra's visit to China, a landmark cultural exchange, while Kumalaningrum (2021) analyzed Korean music's influence in fostering diplomatic relations with Indonesia through the "Hallyu" phenomenon. Herrera (2021) emphasized Latin America's contributions to shaping transnational musical identities, and Karamy & Baynus (2020) identified the West-East Diwan Orchestra as a harmonious symbol in the Middle East. Fillion (2023) explored Canada's strategic cultural influence through participation in international music festivals, while Jamnongsarn (2017) highlighted the cross-cultural musical exchanges between Indonesia and Thailand, showcasing music's integration into soft power strategies.

Music as a Tool for Reconciliation and Peacebuilding

A growing body of literature addresses music's transformative role in resolving conflicts and fostering peaceful coexistence. Zhu (2023) analyzed educational initiatives centered around music within the framework of the "Chinese Dream," demonstrating its dual cultural and diplomatic roles. Criss (2019) emphasized music's function as a channel for exchanging ideas and asserting global values, while Novitasafitri and Hartati (2022) examined the cultural-ethical influence of American pop music in Indonesia, illustrating its role in cross-cultural integration. Everist (2021) highlighted the Paris Opera's contributions to French diplomacy, and Ogunnubi & Idowu (2022) explored the religious dimensions of music, underscoring its ability to amplify cultural influence through spiritual practices.

Musical diplomacy has been instrumental in conflict resolution and peacebuilding, fostering dialogue between opposing parties. For example, the West-Eastern Divan Orchestra, as analyzed by Karamy & Baynus (2020), brings together musicians from conflicted regions, promoting communication and mutual understanding. Such initiatives demonstrate how music can transcend political divides, enabling cooperation and peaceful coexistence. These studies affirm music's profound potential as a diplomatic tool for resolving disputes and building bridges between societies.

Methodology

The research procedure included several stages aimed at a comprehensive study of the impact of music on international diplomatic relations. The first step was to define the essence of music diplomacy as a tool of cultural influence that can help strengthen international relations. The next step was analysing the music market, which included statistics on global music industry revenues to assess the economic potential of

music initiatives in cultural diplomacy. The final part of the procedure involved researching real-life cases of international music events that contributed to reducing political tensions and improving relations between countries, including the data in the table to better understand the different contexts of music diplomacy.

The methodological approach employed methods that complemented each other and comprehensively analysed the topic. The comparison method allowed us to compare different cases of music diplomacy to identify similarities and differences between music initiatives in different countries, such as the United States, Iran, Israel, and Palestine. The synthesis method combined data on music's economic and cultural impact. This allowed us to summarise the results and outline the role of music initiatives in international relations.

An inductive approach helped to highlight key trends in the field of musical diplomacy. At the same time, a generalisation method contributed to the development of frameworks and recommendations for the further development of cultural exchange. By academic standards, the study applied a systemic analytical approach that critically analysed cultural, economic and political factors. The applied methodological approach made it possible to comprehensively highlight how musical events can shape international relations due to their influence on social and political processes. The author's approach revealed the possibilities of using musical measures to resolve modern conflicts, opening new perspectives for the study of the role of music as a diplomatic tool.

Justification of Selected Methods

The methods of comparison, synthesis, generalization, and induction were chosen to provide a multidimensional approach to understanding the role of music in international diplomatic relations. The comparison method was instrumental in evaluating diverse cases of music diplomacy across different geopolitical contexts, such as the United States, Iran, Israel, and Palestine. This method ensured the identification of both shared patterns and unique characteristics of musical initiatives globally, providing valuable insights into their effectiveness. The synthesis method was employed to merge quantitative and qualitative data, allowing for a holistic understanding of music's cultural and economic impact. By integrating these perspectives, the study highlighted how music diplomacy serves as a bridge between diverse social and political landscapes.

The inductive approach was pivotal in identifying trends and patterns within music diplomacy, enabling the extraction of general principles from specific instances. For example, the study uncovered common themes, such as fostering mutual understanding and reducing political tensions through musical events. Finally, the generalization method facilitated the development of broader frameworks and actionable recommendations, making the findings applicable to future cultural diplomacy initiatives.

Ethical Considerations

This study adhered to strict ethical standards, especially in the analysis of potentially sensitive data. The research focused on publicly available information, such as statistics, documented events, and case studies, ensuring transparency and accessibility. Care was taken to avoid misrepresentation or exploitation of cultural contexts, particularly when discussing sensitive geopolitical situations involving countries with ongoing conflicts.

Special attention was given to ensuring cultural sensitivity, respecting the values and traditions represented in the musical initiatives analysed. Ethical practices extended to maintaining objectivity and avoiding bias in interpreting the data, particularly when discussing political tensions and their resolution through cultural diplomacy. These ethical considerations were crucial in ensuring the integrity of the study and its applicability to real-world scenarios.

Results

The findings of this study align closely with the existing body of literature, affirming music's transformative role in cultural diplomacy as a bridge between nations and cultures. Building on Dunkel & Schiller's exploration of music's influence on national identity and Davies' insights into its empathetic potential, the results underscore the practical and symbolic significance of musical initiatives in fostering mutual

understanding and resolving political tensions. By highlighting case studies where music diplomacy reduced conflicts and strengthened international bonds, this research deepens theoretical frameworks, showcasing music as a dynamic agent in both cultural integration and global political strategy. These implications not only validate prior academic perspectives but also provide actionable insights for leveraging music in modern cultural diplomacy to address contemporary geopolitical challenges.

Over the centuries, the art of music has had a considerable influence on the negotiation processes in various empires and states. Numerous examples highlight the vital role of music as a means of communication that unites civilisations and promotes positive international relations. As shown in Figure 1, there are three areas of music in diplomacy.

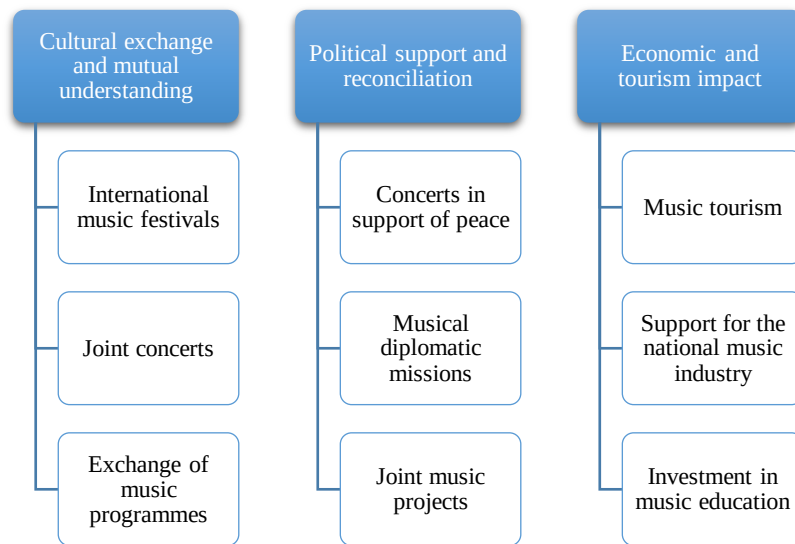


Figure 1. The role of music in strengthening international diplomatic relations.

Source: developed by the authors

Cultural exchange and mutual understanding are actively promoted through international music festivals such as Glastonbury in the UK, which has brought together musicians from different countries every year since 1970 (Lytvynov, 2014). Joint concerts, such as the 2018 South and North Korean concert at the Pyeongchang Winter Olympics, have become a symbol of peace and understanding between the two countries. Political support and reconciliation are realised through musical diplomatic missions, as in 1956, US jazz musicians, including Louis Armstrong, took part in international tours as part of the Jazz Diplomacy programme to strengthen relations with European and Asian countries. Music's economic and tourism impact is evident in the case of music tourism in Vienna, Austria, where annual classical music concerts attract tourists worldwide and support the local economy.

One example of this strategy is international music festivals, which are held to strengthen friendly relations and mutual understanding between nations. These events provide cultural exchange and help reduce tensions in relations, which is especially important for countries with different political interests.

The music market is showing a steady development, as it underlines the growing importance of music in the world. According to Statisticians 2024, global music industry revenue increased from \$13.7 billion in 2010 to \$28.6 billion in 2023, indicating a significant increase in the popularity of music. After a stable period in 2010-2014, when the market remained at 13-14 billion, the industry began to proliferate in 2016. This growth is driven by the development of digital platforms that have facilitated access to music and contributed to its global popularisation. The steady growth in music revenues reflects the growing interest in music as a tool for cultural diplomacy, as music becomes more accessible to a broader audience and provides a platform for interaction between countries (Figure 2).

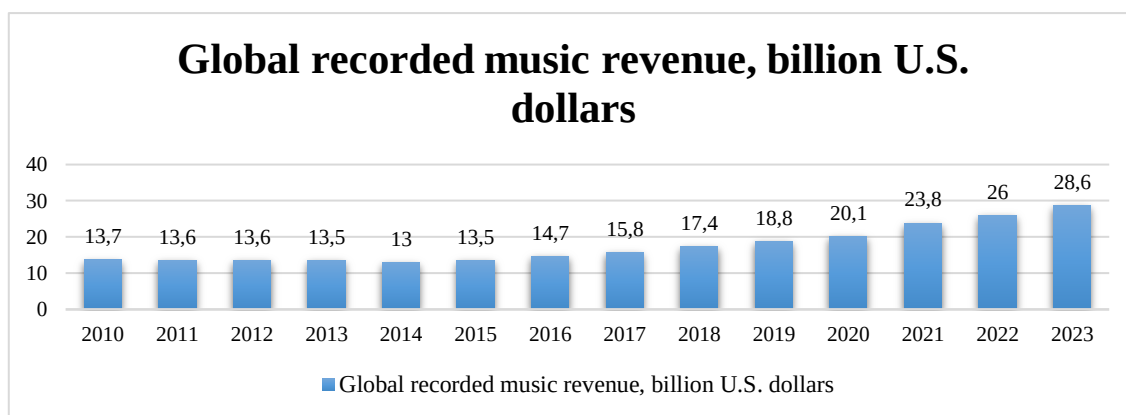


Figure 2. Global recorded music revenue from 1999 to 2023 (in billion US dollars)

Source: Statista (2024)

Studies of traditional music from Africa and Asia at leading European universities provide a deeper understanding of these regions' historical and socio-cultural contexts. Scientific symposiums and conferences dedicated to the intercultural analysis of musical forms contribute to the development of music diplomacy. International music therapy seminars help expand the application of scientific knowledge in practical areas. Scientific and cultural exchange in music is becoming a research and practical tool that enriches cultural experience and opens new horizons for interdisciplinary cooperation.

Music has proven to be an effective tool for resolving military conflicts and reducing tensions in different parts of the world. During the Cold War, joint musical projects between the United States and the Soviet Union, such as jazz tours, promoted cultural rapprochement between peoples and highlighted the importance of dialogue. More recently, music has also been used for peacemaking initiatives in the Middle East: the West-Eastern Divan Orchestra, founded by conductor Daniel Barenboim, brought together musicians from Israel, Palestine and other Arab countries to promote dialogue between nations in conflict. Such initiatives demonstrate the power of music to create an atmosphere of understanding and cooperation, even in regions where traditional diplomatic efforts may not be practical.

Table 1.

International diplomatic events related to music

Country	Year/Date	Event	Content of the diplomatic meeting
South Korea and North Korea	2018/April 27	Spring is Coming concert in Pyongyang	A concert featuring South Korean musicians symbolises the rapprochement between the two Koreas and promotes cultural exchange.
Cuba and the United States	2019/October 15	Concert by the Minnesota Symphony Orchestra in Havana	The orchestra's performance is aimed at improving US-Cuban relations through cultural exchange.
Austria and Iran	2020/February 12	Music evening "Bridges of Friendship"	A joint concert by the Vienna Philharmonic Orchestra and Iranian musicians to demonstrate cultural respect.
China and Germany	2017/9 July	German-Chinese music festival	A classical music concert in Berlin highlights the two countries' cultural partnership.
The United States and Iraq	2014/August 30	Concert of the orchestra "In Support of Peace"	An Iraqi youth orchestra performs in Washington, DC, supporting peace initiatives and cultural understanding.
Ukraine and Poland	2021/August 24	Concert "Ukrainian Independence" in Warsaw	A joint concert honouring the 30th anniversary of Ukraine's independence to support cultural dialogue.
Israel and France	2013/November 20	Music Without Borders Festival	A classical music concert in Paris to strengthen cultural ties between the Israeli and French communities.
The United States and Iran	2015/April 27	Jazz evening "Sounds of Peace"	American jazz musicians performed in Tehran for cultural exchange and tension reduction.
India and Japan	2022/March 23	Concert "Musical Dialogue" in Tokyo	A joint concert honouring the 70th anniversary of diplomatic relations aimed at strengthening cultural cooperation.

Source: developed by the authors

The musical diplomatic events presented in Table 1 have played a key role in strengthening cultural ties between states, promoting deeper mutual understanding and spreading respect. The 2018 Spring Has Come concert symbolised improved relations between South and North Korea and highlighted the unifying power of music. Likewise, the performance of the Minnesota Orchestra in Havana and the "Bridges of Friendship" concert between Austria and Iran demonstrate how artistic initiatives can bridge cultural and political divides, providing neutral platforms for cross-border dialogue and mutual respect.

The notebooks used in this project can be used as compelling evidence in presenting artistic encounters as an approach to diplomacy relations for countries such as Ukraine and Israel that have been at war with each other. Music used in conflict resolution strategies often depicted in the art of children can serve beyond the imagination of the present socio-political calamitous polemics. Specific initiatives, particularly those embracing music, will enhance the existing ties between the nations. The prospects for peace-building through music in today's divergent themes of development cooperation are very bright, if not the brightest, bar the current politics of the day. Seeking examples in the past, regional music projects involving local countries in Europe could play a more positive role than aggravating the conflicts. In this line, musical-based exchanges will likely promote peace-building efforts within conflict-zoned territories.

Discussion

The study we present here shows that cultural events such as concerts or festivals play a crucial role in bridging the gap within the G7 countries and in their external relations, to the extent that even Choudhary (2022) and Marc (2020) agree. Choudhary (2022) studies music's utility in safeguarding one's ethnic culture in the twentieth century.

Marc (2020) demonstrates the synergy between music and national interests by discussing how French music is diffused as a means of cultural diplomacy to support one's nation's image abroad. Mishra (2022), while emphasising the political dynamics of music diplomacy, evaluates the usefulness of music in the reconciliation process between India and Pakistan, which have always been at war.

Tallis (2022) studies the reception of the musical group Kraftwerk about the German nation's image, particularly after World War II, and explains how music can restore a country's pride again. They have searched for existing theories that would allow looking at music.

De Oliveira et al. (2021) argue that it can be implemented in education and add that it is useful in overcoming cultural attitudes. Quevedo-Redondo et al. (2023) note the importance of access to digital services such as Spotify and other music platforms in pursuing music diplomacy.

O'Keeffe (2024) shows the importance of military music in France to sustain the national spirit and unity, particularly in war times. Rijo Lopes da Cunha (2024), regarding the transfer of musical practices from the Arab Levant to the Gulf region, suggests that music is a regional uniter and helps communication in the sense that its practice is intercultural, thus supporting our claims regarding the purpose of cultural exchange which is global solidarity. Paczkowski (2020) focuses on the various facets of 'music diplomacy' since the 18th century when music became essential in aristocracy communication to reaffirm influence.

Conclusions

Music is one art that can be used in cultural diplomacy and stands above all because of her ability to reach out and captivate emotional spaces. Studies on how nations have tried to resolve issues through music events show how, in some cases, music promotes peace even where there is apprehension and conflict. Opportunities for interacting through musical performances such as joint concerts, international music festivals, and other cultural activities help in projecting a good image and creating respect for different peoples' cultures. Music as a diplomatic communication medium allows countries to lobby tendencies, defend borders and cultures and promote regional goodwill on a broader scale.

This study provides a novel contribution to the field of cultural diplomacy by emphasizing the multifaceted role of music as a bridge between cultures and a tool for fostering peaceful international relations. By integrating insights from global case studies, it underscores how musical initiatives transcend political boundaries, promoting empathy, cultural exchange, and long-term cooperation. The research highlights the

amplified impact of digital technologies in enhancing music's reach, presenting innovative pathways for leveraging music as a transformative diplomatic instrument in contemporary global politics.

These developments help the countries retain their music and share that music with the world, thus promoting cultural diversity. In these instances, music begins to be viewed as a powerful weapon in global politics, assisting in maintaining world peace and preserving common civilisation. The positive aspects of musical performances in foreign policy are necessary for mitigating tensions between states with different, often contradictory goals and achieving long-term cooperation. Music diplomacy can be further researched regarding its political aspects and the effectiveness of such approaches in conflicts. Understanding music as quite an integral component of cultural diplomacy, it is easy to agree that this will promote international relations, create and develop a shared cultural sphere and ensure practical international cooperation in the future.

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Personality adaptation in young Ukrainians during the war

Адаптація особистості молодих українців під час війни

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Abstract

The article discusses the problem of personality adjustment among young people in the context of Russia's war against Ukraine and social upheavals in the early 21st century. It also describes social environment conditions as frustrating factors that affect the mass consciousness of the population, especially young people. The article reveals the features of personality adjustment in the context of its type, the impact on one's self-esteem and social activity, as well as the resilience of young people to psychologically traumatic events in the context of Russia's war against Ukraine. Consequently, according to their content, the article specifies the components of personality adjustment (cognitive, conative, emotional). The correlation analysis demonstrates that a reverse statistical correlation

Анотація

У статті розглядається проблема особистісної адаптації молоді в умовах війни Росії проти України та соціальних потрясінь на початку 21 століття. Охарактеризовано умови соціального середовища як фруструючі фактори, що впливають на масову свідомість населення, особливо молоді. У статті розкриваються особливості адаптації особистості в контексті її типу, вплив на самооцінку та соціальну активність, а також стійкість молоді до психологічно психотравмуючих подій в умовах війни Росії проти України. Отже, відповідно до їхнього змісту, у статті виокремлено компоненти особистісної адаптації (когнітивний, конативний, емоційний). Проведений

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exists between playful problem-solving and problem-solving ability ($r=286$, $p<0.01$), positive reappraisal and the desire for dominance ($r=-376$, $p<0.05$), internality and seeking social support ($r=-264$, $p<0.01$), while a significant correlation is observed between self-acceptance and problem-solving ($r=262$, $p<0.05$), highlighting the interplay of planning, self-evaluation, responsibility, and independence in shaping young people's problem-solving and interpersonal dynamics. It highlights the need to develop new concepts for regulating the state of the mass consciousness via mass communication tools to maintain mental health and stability under wartime conditions in Ukraine. The article proposes a new approach to developing personality adjustment programmes to prevent frustration, neuroses and psychological traumas among young people in the conditions of Russia's war against Ukraine. It defines the concept of personality adjustment among young people under wartime conditions in Ukraine, identifies frustrating factors affecting them and explores young people's personality adjustment and attitudes towards Russia's war against Ukraine.

Keywords: frustrating factors, psychological traumas, young people, destructive life attitudes, personality adjustment.

кореляційний аналіз показує, що існує зворотна статистична кореляція між плановим розв'язанням проблем і здатністю розв'язувати проблеми ($r=286$, $p<0,01$), позитивною переоцінкою та бажанням домінування ($r=-376$, $p<0,05$), інтернальністю та пошук соціальної підтримки ($r=-264$, $p<0,01$), тоді як між самоприйняттям і вирішенням проблем спостерігається значуща кореляція ($r=262$, $p<0,05$), підкреслюючи взаємодію планування, самооцінки, відповідальності та незалежності у формуванні способів вирішення проблем молодими людьми та міжособистісної динаміки. Наголошено на необхідності розробки нових концепцій регулювання стану масової свідомості засобами масової комунікації для підтримки психічного здоров'я та стабільності в умовах воєнного часу в Україні. Запропоновано новий підхід до розробки особистісних корекційних програм для профілактики фрустрації, неврозів і психологічних травм серед молоді в умовах війни Росії проти України. Визначено поняття особистісної адаптації молоді в умовах воєнних дій в Україні, визначено фрустраційні чинники, що впливають на них, досліджено особистісну адаптацію молодих людей та їхнє ставлення до війни Росії проти України.

Ключові слова: фруструючі чинники, психологічні травми, молодь, деструктивні життєві установки, особистісна адаптація.

Introduction

Nowadays, it is crucial to study the mental states of young people during adjustment to the shock of Russia's war against Ukraine in the context of psychological theory and practice. In this regard, the problem of personality adjustment under wartime conditions in Ukraine is indeed relevant.

Current conditions of the social environment experience significant changes, which assume one's capacity for personality adjustment in the conditions of Russia's war against Ukraine. The traditional ways of achieving adaptability are no longer suitable for the current social space, and certain transformations have been witnessed in the form of different behavioural strategies under wartime conditions, contributing to one's self-conceptual satisfaction. In turn, personality adjustment ensures a stable mental state of normalcy, which protects one from psychologically traumatic events, forms personal experience in social relations, establishes one's status in group hierarchy and maintains one's activity in a dynamic social space.

There are numerous studies on the problem in foreign and Ukrainian discourse. Varii (2008) and Zavatska (2010) confirm the variety of discrete psychological adjustments from the perspective of an evolutionary approach. One area for studying human behaviour and young people's personality adjustment in the context of Russia's war against Ukraine is an attitude seen as readiness for action, determined by one's needs and the corresponding environmental situation. It is important to note that personality adjustment also focuses on attitudes in learning and professional acquisition. Some scholars believe that, from the perspective of economic processes, frustrating factors for young people in the context of Russia's war against Ukraine are as follows: a decline in employment rates; an increase in unemployment rates; mass migration; a decrease in the well-being of the masses; the backdrop of reduced solvency and budget revenues for social processes (Shportun et al., 2020; Grossman et al., 2015; Braun-Lewensohn et al., 2015; Dupuis & Cohn, 2011). Altogether, they pose a danger of psychological traumas and lead to the formation of a defensive attitude

in social interactions for most people. In turn, this affects the stability of attitudes towards historically formed traditions, values and moral guidance.

In this particular context, it is noteworthy that there is a growing tendency towards impaired adaptation resulting from military events in Ukraine. One of the modern studies by Sodolevska (2024), covering a sample of 50 people aged 18 to 35 years, was aimed at assessing the mental state of the participants, in particular, the PHQ-9 scale was used to determine the level of depression. According to the results of the analysis, there was a significant improvement in the mental state of the participants of the study group after 35 days of psychological intervention (Fig. 1). Thus, a significant decrease in the level of depression and anxiety was observed on the PHQ-9 scale ($p < 0.001$).

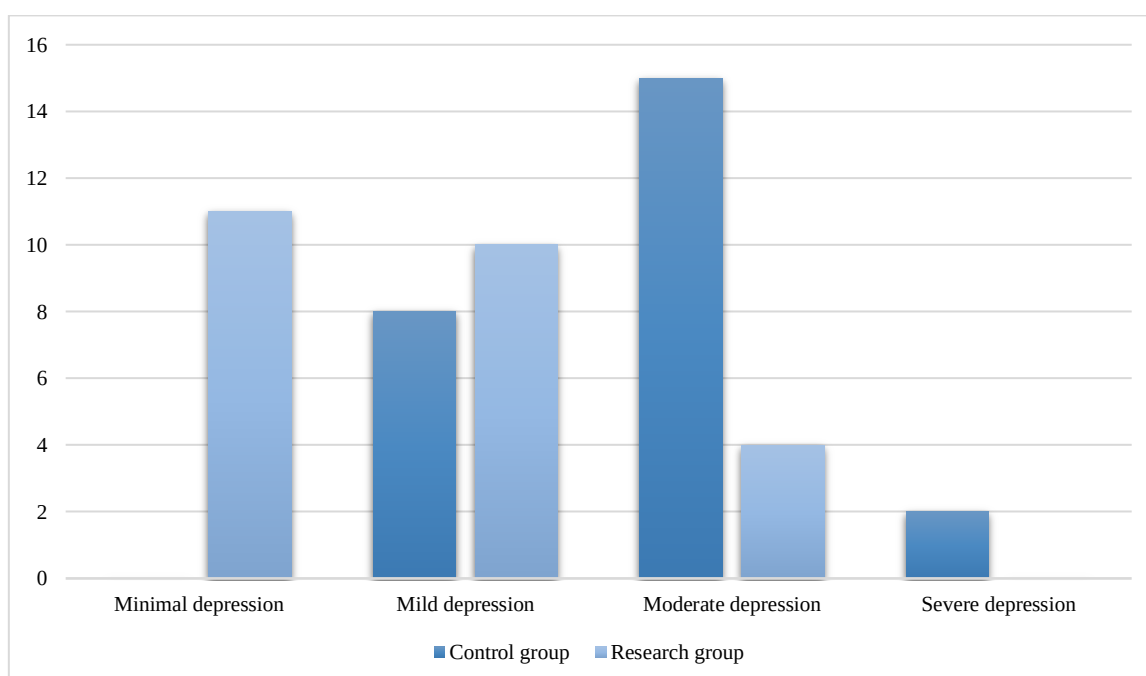


Figure 1. Comparison of qualitative values of the health questionnaire.

Source: The authors' conception based on Sodolevska (2024).

This article considers the concept of young people's personality adjustment in the conditions of Russia's war against Ukraine as the most complex psychological phenomenon associated with the functioning of cognitive, conative and emotional components. During personality development, personality adjustment forms individually. At the same time, one can observe how the essential strategies characteristic of this particular individual are being established.

Importantly, this article contains experimental results on the types of personality adjustment, the main ones being defined as constructive and destructive. The type of young people's personality adjustment in the conditions of Russia's war against Ukraine results from ontogenetic personality development. The latter is characterised by the features of mental states when implementing adjustment strategies, an area of activity, perception of social space and interpretation of information about environmental events. Thus, the type of personality adjustment forms from the early period of human life.

This article aims to a) identify the correlation between the type of one's personality adjustment and his/her attitude towards societal changes caused by Russia's war against Ukraine, b) specify the concept of young people's personality adjustment under wartime conditions in Ukraine, c) identify frustrating factors affecting young people and d) study young people's personality adjustment and attitudes towards Russia's war against Ukraine.

Literature Review

Many scientific fields view adjustment as a prerequisite for survival in the environment. Given the wartime conditions in Ukraine, psychology considers the personality adjustment of young people from different

perspectives. Internal adjustment occurs through a change in the operation of personal functional systems and structures, when one's behaviour and external forms of communication are completely transformed and integrated into existing conditions in the form in which they are expected by the environment, without affecting its established norms and dynamics of development (Maksymenko et al., 2019). External adjustment does not fundamentally change the internal content of personality; it only contributes to learning new forms of behaviour and expression of emotions without internalising these principles as internal personality traits (Spytska, 2023). Preserving fundamental interests and values, mixed adjustment is implemented through a partial restructuring of internal and external characteristics of personality manifestation to correspond to the environment (Sliusarevskyi, 2018).

In addition, external-external passive adaptation for difficult life situations is a strategy for avoiding the situation and changing the social environment. This type of adaptation is practically not characteristic of the studied sample since it is usually inherent in individuals with low activity in adaptive processes (Nazarov & Levchenko, 2024). Internal-external passive adaptation is also a strategy of the fugitive, but the content of this strategy is different (Volodarska & Karabaieva, 2023). Thus, a person may experience problems in social relationships due to the peculiarities of his communicative or other qualities – these characteristics do not change when the environment changes.

Progressive adjustment ultimately implies compliance with the interests and goals of the individual and society. Being relatively formalised, regressive adjustment corresponds to neither the group's interests nor the individual's and might even cause significant damage to both sides of social interaction (Kistersky & Zadoia, 2024). In terms of adjustment mechanisms, there is a distinction between voluntary and forced adjustment in the context of Russia's war against Ukraine. Voluntary adjustment presupposes one's desire to meet the demands of the environment, while forced adjustment arises under insurmountable external influences, leading to one's deformation (Krasilova et al., 2024; Kuzminov & Linskiy, 2023).

From the perspective of an evolutionary approach, there are many discrete psychological adjustments. One area for studying human behaviour and young people's adjustment to Russia's war against Ukraine is an attitude seen as readiness for action, determined by one's needs and the corresponding environmental situation. It is important to note that personality adjustment also focuses on attitudes in learning and professional acquisition (Fedorchuk, 2014).

Psychology has explored various manifestations of human adjustment and identified cause-and-effect relationships between its effectiveness and diagnostics principles (Khallo et al., 2023). At the same time, insufficient emphasis is placed on the internal content of young people's mental states under wartime conditions in Ukraine, both in the process of adjustment and in a state of adaptability (Orban-Lembryk, 2005).

Given Russia's war against Ukraine, adjustment is becoming increasingly relevant as a prerequisite for the effective functioning of personality whenever problematic situations arise due to internal or external factors. In this context, the article by Predko et al. (2023) considers global transformations under such conditions as a factor of frustrating influence on personality, which represents a problematic situation. Moreover, globalization alters social norms and values, complicating individual adaptation and potentially leading to identity crises (Shormanbayeva et al., 2022). Individuals may experience a dual existence of extreme individualism and depersonalization, resulting in apathy and disorientation (Zolotukhin, 2018).

War as a background of social and psychological adaptation is determined by dynamic changes in the perception of prospects, values, and priorities of young people (Krasilova et al., 2024). According to Trofimov & Zabolotna (2023), special attention should be paid to the impact of war on the psycho-emotional state, which manifests itself through increased levels of anxiety, depression, and a sense of uncertainty. At the same time, the studies by Dekusar, & Davydova (2024), Petrochko et al. (2022), and Predko et al. (2023) emphasise the role of positive adaptation mechanisms, such as the development of a sense of community, mutual assistance, and the desire for self-realisation even in crisis conditions. In addition, modern approaches to youth adaptation include the concepts of cognitive behavioural therapy aimed at developing emotional self-regulation skills (Dekusar, & Davydova, 2024).

Thus, the socio-psychological adaptation of young people under martial law is a multidimensional process that requires a systematic approach. Therefore, the combination of individual psychological resources,

social support, and external institutional factors forms the basis for maintaining mental health and developing the resilience of the younger generation in times of crisis.

Methodology

1. The sample for this study consisted of 60 respondents representing five social groups: education workers, health workers, youth (students and employees of budgetary organizations aged 18–25), war veterans, and pensioners. These groups were selected because of their socio-economic vulnerability and dependence on state support, which was significantly affected by the war conditions in Ukraine. Inclusion criteria required that participants be members of one of the specified social groups, residents of regions impacted by the socio-economic consequences of the war, and voluntarily participated in the study.
2. Standardized psychological techniques, including methods developed by Rogers (1931) and Dymond (1955), were used to assess levels of personal adaptation, while Eysenck's methods (2006) were applied to diagnose mental states such as rigidity, anxiety, and frustration.

Instead, the analysis of coping strategies, which includes research on the Holmes & Rahe (1967) to assess stress resistance and coping strategies according to the methods of Amirkhan (1990), Lazarus, & Folkman (1984; 1991).

Statistical data analysis was used to determine the distribution of levels of adaptation and coping strategies among different social groups.

The method of synthesis was also applied to the scientific literature to form a holistic view of the impact of the studied factors on the adaptation of young people to war conditions and to develop a comprehensive approach to assessing adaptation processes.

The method of systematisation was employed to classify and organise the data obtained according to specific criteria, which allowed the information to be structured and the main trends and patterns in the behaviour of young people in war conditions to be identified. Then, the generalisation method was used to formulate general conclusions and recommendations based on the analysed results.

Results

Frustrating Factors that Impact Young People under Wartime Conditions in Ukraine.

As already mentioned, frustrating factors that impact young people in Russia's war against Ukraine from an economic perspective are a decline in employment rates, an increase in unemployment rates, mass migration, a decrease in the well-being of the masses, and the backdrop of reduced solvency and budget revenues for social processes. These factors threaten historically formed traditions and values (Grossman et al., 2015).

Despite Ukraine's rapid development as a coherent, independent state and a significant actor in world political processes in the early 21st century, another frustrating factor is the lack of stability within the country under wartime conditions: the foreign-policy situation remains dangerous; military actions continue in many regions; state coups are being organised; terrorist acts are being carried out. This does not create an impression of security among the population since conflicts in neighbouring regions directly or indirectly affect the lives of Ukrainians, including young people (Lewicka, 2012).

The residents of different regions of the country, characterised by differentiated educational, economic, geographic, and climatic conditions and varying by national, cultural, religious, and traditional aspects, are not homogeneous in terms of their content. Consequently, mass migration in search of employment within the country creates an additional threat to the psychological stability of the population, which eventually necessitates constant correction of personality adjustment strategies in the context of Russia's war against Ukraine, both for migrants and indigenous residents of the regions (Anderson & McLachlan, 2016).

The pronounced difference in incomes of various population strata and the inability to solve economic balance problems at this historical development stage increase social tension among the masses. The political and economic instability increases the frustration among the population and intensifies the risk of

psychological traumas. Global transformations of socio-economic, political, and cultural processes worldwide affect the stability of moral and ethical traditions in society and ultimately lead to a change in goals, evaluative judgments, and behavioural attitudes. In these conditions, an essential aspect of life is one's capacity for personality adjustment (Shportun et al., 2020).

Psychology offers two basic approaches to adjustment: 1) an ascertaining approach that determines the levels of adjustment indicators without considering its content characteristics; 2) a systemic approach that deals with the content structure of young people's adjustment in the conditions of Russia's war against Ukraine.

Structural Components of Young People's Personality Adjustment in the Conditions of Russia's War against Ukraine.

In Russia's war against Ukraine, cognitive, conative and emotional components constitute the structure of young people's personality adjustment. They play a decisive role in assuring quality and contributing to one's self-conceptual satisfaction without conflict with the social environment under wartime conditions in Ukraine (Bizumic et al., 2013).

The authors' analysis of adjustment has made it possible to identify the content of structural components of young people's personality adjustment in the context of wartime conditions in Ukraine. *The cognitive component* includes assimilation and accommodation in the social space at the perceptual level, thus determining the presence or absence of young people's satisfaction with the interaction with the social environment. This forms unconscious attitudes towards the perception of all social processes directed at the individual and the groups interacting with him/her (Lunov et al., 2023; Melnychuk et al., 2022).

The emotional component is an evaluative system of perceiving values, self-conceptual integrity and emotional maturity. It consists of the following elements: anxiety (in the context of self-esteem perception), frustration (determining one's motivation to form aspirations and the presence of internal personal conflicts), rigidity (depending on a level of the indicator that affects the formation of new adaptive structures and systems, the elaboration of new behavioural strategies, the variability of thinking, the ability to empathise, flexibility in transmitting their emotional experiences and resilience to stress); aggression (in the context of choosing or striving to achieve something or diminish others' achievements to establish superiority through denigration) (Sannikov & Kyrychenko, 2024; Spytska, 2024).

The conative component is a set of knowledge about the patterns of social events, behaviour according to social roles, the influence of socio-cultural traditions of society and norms and practices of social experience. Altogether, they directly affect one's choice of behavioural variations, the actualisation of abilities to regulate interpersonal relationships, and the rationality of youth activity in Russia's war against Ukraine.

The ratio of these elements determines the type of personality adjustment (constructive or destructive). At the same time, the nature of aggression's influence on personality adjustment type cannot be established due to the ambiguity of one's aggression motives.

Research on Young People's Personality Adjustment and Attitudes towards Russia's War against Ukraine.

This article researches young people's personality adjustment, attitudes towards Russia's war against Ukraine, and the current economic reality. The experiment involves representatives from five social groups: education workers, healthcare workers, young people (students and employees of budgetary organisations aged 18 and 25), veterans of military action and retirees. Thus, emphasis is placed on the least protected social groups, predominantly dependent on state support. It is their incomes that have been affected by wartime conditions in Ukraine, generating high variability of problematic situations in the lives of each of them.

Importantly, this comprehensive psychological study includes a series of tests, interviews, observations, and statistical data analysis. Rogers (1931) and Dymond (1955) decided to apply psychological methods to identify levels of personality adjustment. Eysenck's methods (2006) were used to diagnose mental states

following the levels of rigidity, anxiety, and frustration. The authors' previously developed methods were employed to determine the type of personality adjustment (Harasymiv, 2009).

Below are the research results on young people's personality adjustment during the socio-political crisis in Ukraine (Figure 1).

In particular, psychological methods by Rogers (1931) and Dymond (1955) have shown that personality adjustment is within the norm for 40% of the respondents. This process leads to stable adaptability in typical problematic situations without pathological changes in the structure of one's personality or violating the norms of the social group in which one's activity takes place (Skrypnyk, 2005).

At the same time, a low level of personality adjustment is characteristic for 60% of the respondents. For them, this process manifests in a negative attitude towards society, a prevalence of negative moods, a lack of interest in academic activities, careless performance of tasks and unwillingness to work. There are no records of high-level personality adjustment, which confirms young people's no interest in self-assertion during the social-political crisis.

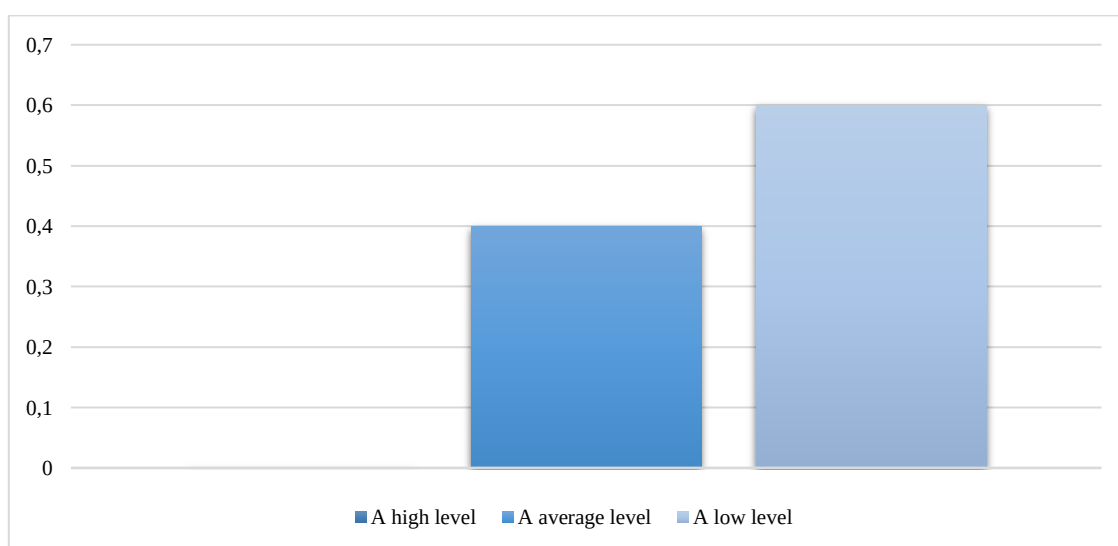


Figure 1. Levels of personality adjustment among young people (by percentage).

Source: The authors' conception based on Rogers (1931) and Dymond (1955).

According to the self-perception scale, 28% of the respondents demonstrate a low level of personality adjustment. They are prone to a negative attitude towards themselves, self-criticism of their thoughts and actions, and feelings of discomfort and insecurity. Only 14% of the respondents show a high level of self-perception, which means a positive attitude towards oneself and unconditional acceptance while maintaining a critical attitude. Finally, 58% of the respondents have an average level of self-perception and accept themselves as a whole, regardless of personal qualities.

Regarding the "acceptance of others" scale, 34% of the respondents demonstrate a low level, 63%—a normal level, and only 3%—a high level. Those with a low-level acceptance of others cannot perceive people around them as they are; those with a normal level may accept some people in certain situations and not others due to certain reasons; and those with a high level can accept others and allow them to be who they are.

The emotional comfort scale demonstrates that 43% of the respondents are at a low level, 42% at an average level and 15% at a high level. A low level indicates emotional discomfort, which may reflect emotional disorders, such as a lowered emotional background, dissatisfaction with life circumstances and emotional tension. A high level of emotional comfort is characterised by emotional well-being, which ensures high self-esteem, self-control and an orientation towards success in achieving goals.

The internality scale shows that most respondents (56%) are at a low level. This means that such individuals fail to take responsibility for the events happening in their lives. At the same time, 42% of the respondents

demonstrate a normal level, and only 2%—a high level. A high level of internality implies a high willingness to take responsibility for one's life.

Concerning the desire for dominance scale, 18% of the respondents show a low level. They cannot assert their interests and quite frequently experience a feeling of anxiety. Meanwhile, 69% of the respondents are at an average level, and only 13% are at a high level. In particular, the desire for dominance implies striving for attention and asserting one's interests.

Figure 2 presents percentage values for the scales of determining personality adjustment levels by Rogers (1931) and Dymond (1955).

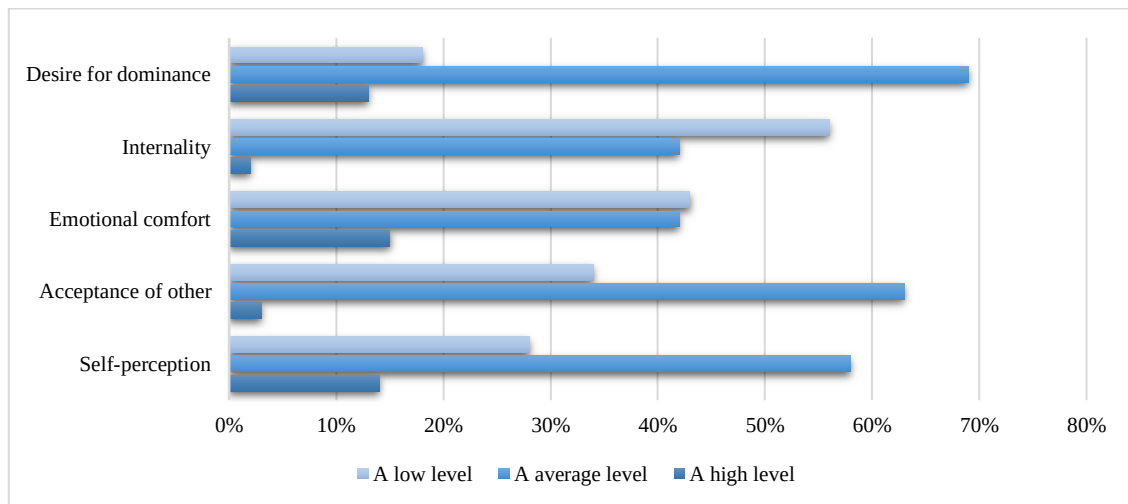


Figure 2. Percentage values for the scales of determining personality adjustment levels.

Source: The authors' conception based on Rogers (1931) and Dymond (1955).

Therefore, according to Holmes & Rahe, (1967), 20 respondents (34%) demonstrate low vulnerability to stress. This indicates a typically high-stress load, manifested by low-stress resistance. However, 12 respondents (20%) are at a high level of stress resistance. A low-level stress load is characteristic of such people as they are also prone to high-stress resistance. At the same time, 11 respondents (18%) show a reasonably high-stress resistance level, indicating a relatively high degree of stress resilience. They experience a minimal level of stress load. It is important to note that the higher one's level of stress resistance, the more effectively one's performance.

Meanwhile, 17 respondents (28%) have a threshold level of stress resistance, characterised by an average stress load and a normal level of stress resistance, respectively. Therefore, stress resistance decreases with an increase in stressful situations. The corresponding percentage values are presented in Figure 3.

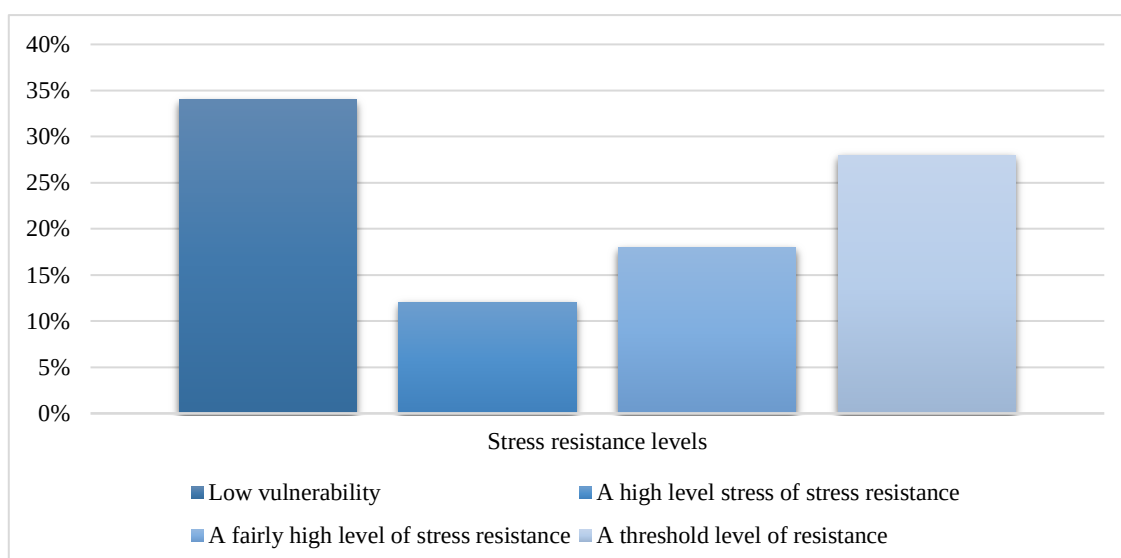


Figure 3. Percentage values for stress resistance levels among young people.

Source: The authors' conception based on Holmes & Rahe (1967)

As shown by the coping strategy indicator (Amirkhan, 1990), particularly by the problem-solving strategy, 63% of the respondents are at an average level, 17% at a high level and 20% at a low level. This scale can be characterised by an active behavioural strategy, wherein one attempts to use all available personal resources to find ways to solve problematic situations effectively. Regarding the seeking social support strategy, 62% of the respondents demonstrate an average level, 13% of them – a high level and 25% – a low level. It implies seeking help and support from their environment, namely, family, friends and other significant people, to solve a problem effectively. The avoidance strategy scale shows that 71% of the respondents are at a low level, given that they tend to avoid contact with their reality and problem-solving; 7% are at a high level, and 22% are at an average level. Percentage values for the coping strategy indicator are presented in Figure 4.

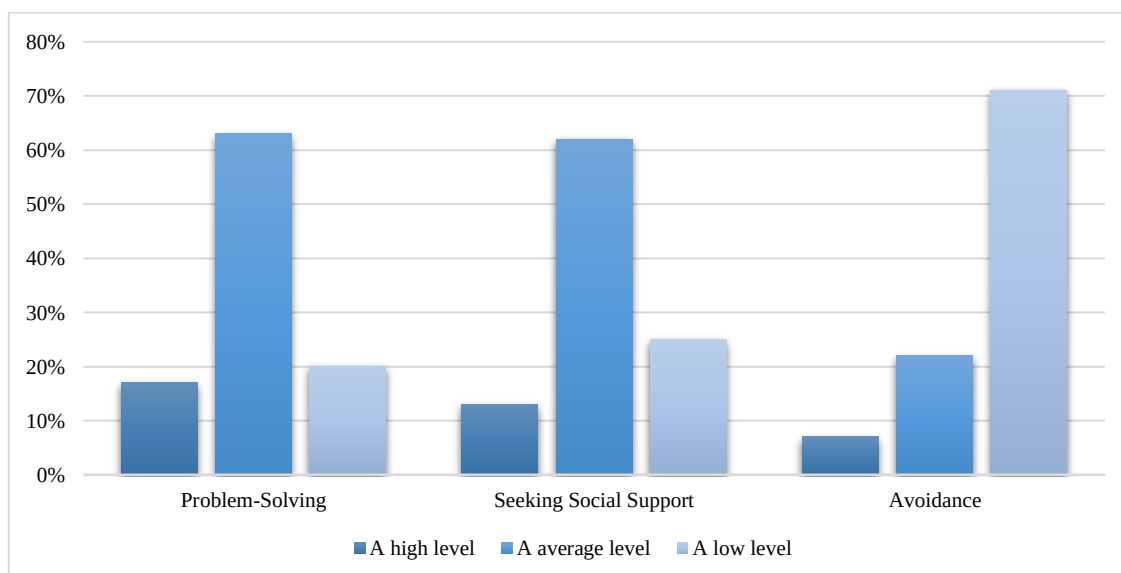


Figure 4. Percentage values for the coping strategy indicator.

Source: The authors' conception based on Amirkhan (1990).

The following conclusions can be drawn based on coping strategies by Lazarus and Folkman (1984; 1991). According to *confrontive coping*, 38 respondents (63%) show an average level, 9 respondents (15%) – a high level and 13 respondents (22%) – a low level. It follows that young people do not always actively defend their interests when solving problematic situations. As demonstrated by *distancing*, out of 60 respondents, 40 individuals (67%) are at an average level, 12 individuals (20%) are at a high level, and

eight individuals (13%) are at a low level. To cope with negative emotions related to a problematic situation, young people should subjectively reduce their significance and, as a result, their emotional intensity. Regarding *self-controlling*, 23 respondents (53%) demonstrate an average level and 28 respondents (47%) – a high level. Accordingly, most young people find it quite challenging to cope with personal problems in today's society. Concerning *seeking social support*, 35 respondents (58%) show an average level, 22 respondents (37%) – a high level and 3 respondents (5%) – a low level. This means most people solve their problems using external (social) resources. The *escape-avoidance scale* demonstrates that 25 respondents (42%) are at an average level, 30 respondents (50%) are at a high level and 5 respondents (8%) are at a low level. Thus, one cope with negative experiences associated with difficulties by responding with denial of the problem or fantasising. *Planful problem-solving* presents the following results: 33 respondents (55%) are at an average level, and 27 respondents (45%) are at a high level. Interestingly, there are no records of a low level, which confirms young people's ability to cope with their problems. Figure 5 presents percentage values for coping strategies by Lazarus & Folkman (1984; 1991).

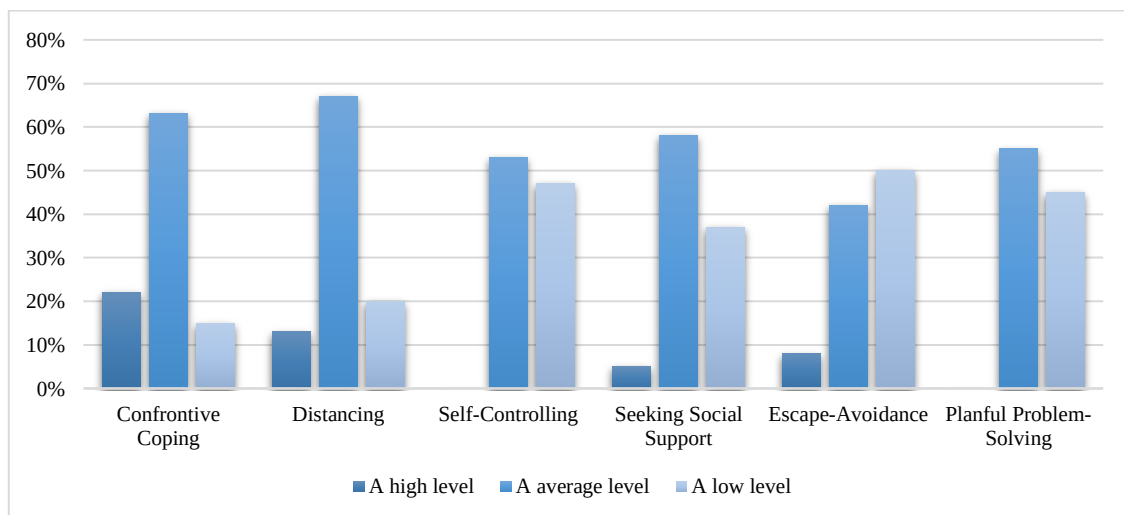


Figure 5. Percentage values for coping strategies.

Source: The authors' conception based on Lazarus & Folkman (1984; 1991).

It was decided to conduct a statistical analysis of the obtained results through MS Excel and SPSS Statistics 17.0. To confirm the effectiveness of empirical research, Pearson's correlation coefficient (3.3): (3.3) was applied to find the magnitude of the normalised deviation r with the formula below:

$$r_{xy} = \frac{\sum(x_i - \bar{x}) * \sum(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 * \sum(y_i - \bar{y})^2}} \quad (1)$$

where n – the number of respondents; x – the results of sample 1; y – sample 2.

Correlation analysis showed the following results.

In particular, social support correlates with the problem-solving scale ($r=447$ at $p<0.05$), which is quite natural since higher social support is likely to result in higher levels of problem-solving ability.

A statistically significant correlation is established between social support and the problem avoidance scale ($r=439$ at $p<0.05$). It means that as social support increases, individuals are more likely to use external resources to solve problematic situations and avoid problems.

Besides, a statistically significant correlation exists between taking responsibility and seeking social support ($r=418$ at $p<0.05$). This can be explained by the fact that when young people face personal problems, they take responsibility for their actions and often seek social support from friends and family.

A statistically significant correlation exists between the desire for dominance and positive reappraisal ($r=376$ at $p<0.05$). This indicates that young people strive to be above others and occupy a leadership position while overestimating their behaviour and attitude towards others.

A reverse statistical correlation is found between planful problem-solving and problem-solving ability ($r=286$ at $p<0.01$). Young people often plan how to solve a problem, and planning itself helps one solve the current problem quickly and without negative consequences.

Also, a significant inverse statistical correlation is established between positive reappraisal and the desire for dominance ($r=-376$ at $p<0.05$). This may indicate that young people who constantly positively evaluate their achievements do not strive to occupy a leadership position in the group and influence others, that is, dictate their will to others. Thus, if the level of positive reappraisal decreases, the desire for dominance increases.

A significant inverse statistical correlation exists between internality and seeking social support ($r=-264$ at $p<0.01$). It follows that young people with a high level of internality tend to show a high degree of readiness to take responsibility for what happens to them and around them. At the same time, the search for social support is significantly reduced because they solve difficulties independently.

Finally, one can observe a statistical correlation between self-acceptance and problem-solving ($r=262$ at $p<0.05$). This indicates that those who have a positive attitude towards themselves and accept themselves as they are while still being critical can effectively solve their problems.

The results of empirical research confirm a relatively low level of personality adjustment among young people during the socio-political crisis. This fact has prompted the authors to elaborate on a corresponding training programme aimed at increasing this level.

Therefore, research on the peculiarities of personality adjustment among young people during the socio-political crisis has presented various results. The majority of the respondents (60%) demonstrate low levels based on the personality adjustment test by Rogers (1931) and Dymond (1955). According to Holmes & Rahe (1967), most respondents (34%) are at a low level of stress resistance. It follows that young people are forced to spend part of their energy and resources to combat negative psychological states that arise during stress associated with the current situation in the country.

As shown by the coping strategy indicator (Amirkhan, 1990), 63% of the respondents have an average level on the "problem-solving strategy" scale and 62% of them on the "seeking social support strategy" scale. This proves a proactive behavioural strategy in which individuals seek help and support from family, friends, and significant others to address their problems effectively.

Coping strategies by Lazarus and Folkman (1984; 1991) confirm that most young people actively use them to overcome difficulties. According to confronting coping, an average level is characteristic for 63% of the respondents; according to distancing – for 67% of the respondents, and seeking social support – for 58%.

Programmes such as MS Excel and SPSS Statistics 17.0 were used to analyse the statistically obtained data. Correlation analysis reveals the following results. A reverse statistical correlation exists between planful problem-solving and problem-solving ability ($r=286$ at $p<0.01$). This could be because young people plan how to solve a problem promptly, while planning helps them solve the current problem quickly and without any unpleasant consequences. Also, a significant inverse statistical correlation is established between positive reappraisal and the desire for dominance ($r=-376$ at $p<0.05$). This indicates that those young people who evaluate their achievements positively do not seek to occupy a leadership position in the group and influence others, that is, dictate their will to others. Accordingly, if the level of positive reappraisal decreases, the desire for dominance increases.

Meanwhile, a significant inverse statistical correlation exists between internality and seeking social support ($r=-264$ at $p<0.01$). Young people with high levels of inequality are much more willing to take responsibility for what is happening to them or around them. At the same time, one can observe how one's striving for social support significantly decreases as one can solve difficulties independently. Finally, a statistical correlation exists between self-acceptance and problem-solving ($r=262$ at $p<0.05$). It means that those with

a positive attitude towards themselves are still critical of themselves, enabling them to solve their problems rather effectively.

Discussion

The results of the study showed a low level of personality adaptation (60% of respondents), reflecting the impact of the ongoing crisis on the ability of young people to adapt to problematic situations. This is especially relevant when considering theories of resilience and psychological adaptability. According to these theories, external stressors, such as economic instability and geopolitical conflict, increase individual vulnerability, which leads to a decrease in psychological well-being and adaptive capacity. This is consistent with the conclusions of many authors, which indicate the dependence of adaptation efficiency on the balance of internal and external mechanisms. According to the works of Maksymenko et al. (2019), internal adaptation requires changes in the functional systems of the personality, which coincides with our conclusions regarding the importance of integrating behaviour into new conditions. At the same time, Spyt'ska's (2023) and Sliusarevskyi's (2018) approaches to external and mixed adaptation confirm the role of gradual adaptation, which was also revealed in our study.

However, specific differences can be traced in the assessment of passive adaptation. For example, Nazarov & Levchenko (2024) indicate the rare use of external-passive strategies under challenging conditions, while we found that such strategies can manifest themselves among individuals with low activity in adaptation processes. This result indicates the need to clarify the conditions under which passive mechanisms dominate. Regarding regressive and progressive adaptation, our results confirm the findings of Kistersky & Zadoia (2024) about their impact on social relations. However, we emphasise the greater flexibility of progressive adaptation in the context of war conditions. In addition, the analysis of the differences between voluntary and forced adaptation described by Krasilova et al. (2024) is consistent with our data on the impact of external pressure on personality deformation.

The results also highlight a pronounced deficit in emotional comfort (43% at low levels) and internal level (56% at low levels). These findings resonate with Eysenck's personality trait theory, which states that increased levels of anxiety and frustration during periods of instability can lead to reduced self-regulation and emotional resilience. Correlation analysis further supports this, establishing statistically significant relationships between self-perception, problem-solving ability, and reliance on social support. For example, the positive correlation between social support and problem-solving ($r = .447, p < 0.05$) emphasizes the critical role of external resources in alleviating psychological distress. Therefore, Spyt'ska (2023) emphasizes that social support mechanisms often compensate for deficits in emotional resilience, highlighting their importance in transitional or crisis periods, especially among young people.

The results of the study contribute to a deeper understanding of the Lazarus and Folkman model of stress coping. The prevalence of avoidance strategies (71% at low levels) and moderate levels of problem solving (63%) suggest that young people predominantly rely on adaptive coping mechanisms. However, the reliance on external social support highlights a potential area for improving the development of internal coping strategies. This is consistent with the theoretical proposition that self-efficacy and internal locus of control are key to effective stress management. The inverse correlation between internality and seeking social support ($r = -.264, p < 0.01$) further supports this, suggesting that interventions aimed at strengthening internality may reduce overreliance on external help. Khallo et al. (2023) emphasize that psychological interventions aimed at strengthening internal self-regulation mechanisms are crucial for promoting resilience and reducing dependence on external coping strategies.

Conclusions

The value of this particular article lies in clarifying the types of personality adjustment among young people under wartime conditions in Ukraine from the perspective of various approaches (internal adjustment, external adjustment, mixed adjustment, progressive adjustment, regressive adjustment, voluntary adjustment, forced adjustment). Notably, the article considers the areas of studying human behaviour and young people's personality adjustment in the conditions of Russia's war against Ukraine, which are seen as an attitude involving readiness for action determined by one's needs and the corresponding environmental situation.

Moreover, the article identifies frustrating factors affecting young people, such as a decline in employment rates, an increase in unemployment rates, mass migration, a decrease in the well-being of the masses, and the backdrop of reduced solvency and budget revenues for social processes. When influencing the consciousness of young people in the context of Russia's war against Ukraine, these factors pose a danger of psychological traumas and lead to the formation of a defensive attitude in social interactions for the majority of people. In turn, this affects the stability of attitudes towards historically formed traditions, values and moral guidance.

In particular, the article investigates the concept of young people's personality adjustment and attitudes towards Russia's war against Ukraine. The experiment involves representatives from five social groups: education workers, healthcare workers, young people (students and employees of budgetary organisations aged 18 and 25), veterans of military action and retirees. Thus, emphasis is placed on the least protected social groups, predominantly dependent on state support. It is their incomes that have been affected by wartime conditions in Ukraine, generating high variability of problematic situations in the lives of each of them. This comprehensive psychological study includes a series of tests, interviews, observations, and analysis of the statistical data obtained. Psychological methods by Rogers (1931) and Dymond (1955) were used to identify the levels of personality adjustment. Eysenck's methods (2006) were employed to diagnose mental states following the levels of rigidity, anxiety and frustration. The authors' previously developed methods were applied to determine the type of personality adjustment.

Further research should focus on elaborating and validating a corresponding training programme aimed at increasing the level of personality adjustment among young people under wartime conditions. It is still essential to conduct a long-term study that fully analyses and diagnoses all the problems associated with personality adjustment among young people, including psychological aspects of the socio-political crisis.

Finally, the article has defined the concept of personality adjustment among young people under wartime conditions in Ukraine. It has identified frustrating factors affecting them, and has explored personality adjustment and young people's attitudes towards Russia's war against Ukraine.

The research's practical implications encompass the development of psychological programs aimed at enhancing emotional resilience and self-regulation among youth. Developing community networks and peer support is essential for improving problem-solving capacities, while interventions focused on fostering proactive coping strategies and an internal locus of control are critical. Policymakers should prioritize accessible psychological resources, such as crisis centers and counseling services, to support young people during crises.

Acknowledgement

Author 1 expanded the concept of personality adjustment among young people in the conditions of Russia's war against Ukraine. Authors 2 and 3 identified frustrating factors affecting young people. Author 4 analysed and suggested methods for studying young people's personality adjustment and attitudes towards Russia's war against Ukraine. Author 5 researched young people's personality adjustment and attitudes towards Russia's war against Ukraine. Author 6 selected relevant scientific studies of Ukrainian and foreign researchers and compiled a list of references.

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Impact of media space design on audience engagement in the digital age: A scoping review

Impacto del diseño del espacio mediático en la participación de la audiencia en la era digital: estudio de alcance

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Abstract

In the digital era, media space is critical for disseminating information and communication. Accordingly, audience interaction largely depends on media design, which affects users' attention and emotional reactions. The study aims to determine how various components of media space (visual elements, interactive features and content adaptability) affect audience interaction with media and to describe how these features can enhance audience engagement. The type of this study is a scoping review. For this purpose, the PRISMA approach was used to collect relevant data, classify it (screening) and further analyse it. The results indicate that effective design can attract attention and retain the audience, stimulating them to interact actively. The impact of interactive design elements

Resumen

En la era digital, el espacio mediático es fundamental para la difusión de información y comunicación. En consecuencia, la interacción de la audiencia depende en gran medida del diseño de los medios, que afecta a la atención y las reacciones emocionales de los usuarios. El estudio tiene como objetivo determinar cómo los diversos componentes del espacio mediático (elementos visuales, funciones interactivas y adaptabilidad del contenido) afectan a la interacción de la audiencia con los medios y describir cómo estas funciones pueden mejorar la participación de la audiencia. El tipo de estudio es una revisión de alcance. Para ello, se utilizó el enfoque PRISMA para recopilar datos relevantes, clasificarlos (filtración) y analizarlos en profundidad. Los resultados indican que un diseño eficaz puede atraer la atención y retener a la

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on audience engagement and their interest in participating in content creation is also studied. The study demonstrated that the design of the media space plays a key role in shaping audience engagement, as it allows for the combination of visual hierarchy, intuitive navigation and branding integrity. The integration of adaptive and interactive technologies is important for promoting a dynamic and user-centered experience, which is especially important in today's digital era. The conclusions emphasise the importance of using adaptive and interactive design technologies, which generally increase audience engagement and positively impact the user experience.

Keywords: digital age, media, communication, design, interactivity, engagement, information architecture.

audiencia, estimulándola a interactuar activamente. También se estudia el impacto de los elementos de diseño interactivos en la participación de la audiencia y su interés en participar en la creación de contenido. El estudio demostró que el diseño del espacio mediático desempeña un papel clave en la configuración de la participación de la audiencia, ya que permite la combinación de jerarquía visual, navegación intuitiva e integridad de marca. La integración de tecnologías adaptativas e interactivas es importante para promover una experiencia dinámica y centrada en el usuario, lo que es especialmente importante en la era digital actual. Las conclusiones destacan la importancia de utilizar tecnologías de diseño adaptativo e interactivo, que generalmente aumentan la participación de la audiencia e inciden positivamente en la experiencia del usuario.

Palabras clave: era digital, medios, comunicación, diseño, interactividad, engagement, arquitectura de la información.

Introduction

Importance of media space design

The media space's design, consisting of visual and interactive components, significantly affects the interaction and shapes its perception and engagement. Human interaction with the new phenomenon of information space - media visuals - is usually presented as interaction and communication between a person and the media. It is an essential research object in various sciences: technical, humanitarian, social, etc. In the modern space, which is often oversaturated with media and visual information, it has become essential to study the potential of media communications actively, their impact on humans, as well as the idea of the need for "visual literacy" or media literacy based on a system of adequate media perception and understanding of media visual images (Jiang et al., 2022). The process of human interaction with the media-visual information space is ensured by visual reception as the primary form of this new internal communication.

Research problem

The research of contemporary scholars indicates that the transformation and development of each culture influence the emergence of a new type of visual perception and evolving vision. Initially, the artistic vision changes, which systematically determines changes in the perception of certain groups and society as a whole (Al-Rahmi et al., 2023). However, the current evolution of perception-seeing is determined by changes in art and by transformation in all subsystems of visual culture - technology, tool design, etc. Accordingly, the post-industrial digital era has influenced the formation of specific, mediated media and the latest technologies (Mills & Brown, 2021). The latter serve as prerequisites for forming a new visual perception of artificial images and visual media texts - visual media perception. Thus, the research problem is how the design of the modern media space, as well as its primary visual and interactive elements, affects the process of audience perception and interaction with information. Therefore, thoughtful design is paramount in the information overload age, where users face vast amounts of content daily. The current media space is not just about transmitting or broadcasting certain information but also shapes the environment in which interaction occurs between the media and the audience. Accordingly, in the context of the rapid development of digital technologies, virtual and augmented reality, the study of media space design is relevant and essential, as it will demonstrate the role of modern technologies and tools in improving user experience and interaction with the audience.

Objective of the study

Therefore, the study's purpose is to determine the impact of various components of the media space (visual elements, interactive features, and content adaptability) on audience interaction with the media. Thus, this

paper will demonstrate how modern digital tools affect user engagement and their ability to participate actively in the media environment.

The main objectives of the study are as follows:

1. To determine the impact of modern digital technologies on the formation of effective media space design.
2. Describe the main trends in the study of the peculiarities of media space formation.
3. Identify effective technologies that influence audience engagement.

The structure of the article

The structure of this study consists of an introduction, which outlines the main research problem and purpose, and a theoretical framework, which describes the theoretical foundations of the study. The study's results consist of an analysis of modern scientific research, which describes the main trends in forming media space design. The discussion compares the data obtained with the results presented in other scientific studies. The conclusions summarise the findings and state the importance of using various digital tools in the media to engage the audience. The conclusions also describe future directions for research.

Theoretical Framework or Literature Review

The impact of trust in the media

The digital media space plays a crucial role in shaping communication processes and requires interdisciplinary understanding. According to Devterov et al. (2024), digital transformation requires a comprehensive worldview from the standpoint of science, philosophy and culture, including epistemological, axiological, ethical and anthropological justifications, which allows us to assess the impact of interactive design on audience engagement. The transformation of the culture of the media space is greatly influenced by factors such as consumer confidence in the source of information. Traditionally, it was believed that columnists, writers, artists, and journalists performed critical social functions, such as mediating between society and individuals, government and individuals, etc. This delegation gave rise to the notion of the “fourth estate”, which quickly depreciated as the media space developed technologically (Chellig et al., 2024; Granic et al., 2020). The emergence and development of Internet technologies and communication channels have made it possible to create and disseminate digital content, present it on various digital platforms, interact quickly with the interested audience, and make real-time changes and adjustments. Researchers note that a characteristic feature of the former traditional information resources was the presentation of concentrated extracts according to specific unofficially approved stencils. However, this approach has become a thing of the past (Pichkur et al., 2023). In digital media, built-in search algorithms create a new look for information material and its “presentation”. In addition, as presented in several works, many sources of information are being digitised due to global digital changes. Moriuchi (2021) described modern tools for forming innovative social media as essential communication channels. The authors also described the role of social media in intercultural marketing to overcome cultural differences

Visual elements and interactivity

The current scientific literature indicates that visual elements are important for the formation of modern interactive media discourse. However, there is a certain debate in modern academic circles. In particular, some authors point out that visualisation is important in the modern digital space because the audience pays attention to this content. Other scholars point out that it is important not to oversaturate information with visuals, as this affects the quality of the information presented (Moore, 2022; Zhang et al., 2022). Contemporary scholars have also described immersive virtual technologies for news delivery. Wu et al., (2021) also analysed users' experiences in using different media effects. Yang (2021) identified vital innovations to enable visual communication based on the potential of digital media. Ye and Li (2022) described the features of digital media art based on augmented and virtual reality. Liu et al. (2024) investigated the user interface transformation based on the introduction of artificial intelligence in interactive media design. Zhang et al. (2022) described visual communication design in the environment of the modern media space. At the same time, Zheng and Yan (2022) analysed the key features of the use of visual technologies and digital images in contemporary media discourse. The digital transformation has

reached a significant scale and requires a comprehensive worldview from the standpoint of science, philosophy and culture, including epistemological, axiological, ethical and anthropological justifications (Devterov et al., 2024, p. 16). Wu et al. (2021) described immersive virtual technologies for news delivery. The authors also analysed the user experience in using different media effects. Although these studies focus on using various modern technologies, their approaches to studying the problem and attitudes towards modern technological innovations differ. While most studies highlight the positive impact of technology, some studies show researchers' concerns about over-analysing personal data for content creation (Ye & Li, 2022; Moriuchi, 2021). In addition, current research needs to explore the role of visual aspects in modern digital media discourse.

Adaptability and automation

Modern scientific literature presents various digital tools used to develop media space design. Parker and Grote (2020) identified the importance of implementing algorithms and automation for practical design. These authors proved that automation and the use of algorithms are essential strategies in the modern media space. Algorithms allow media platforms to optimise the way content looks on different devices. New directions based on the use of AI and adaptive design technologies have significantly influenced approaches to the design of media space, and their active use has changed the understanding of the interaction between the user and media content. Prieto et al. (2022) identified the importance of using a simple interface in modern media. In addition, these authors also described the importance of implementing mixed reality interfaces on youth media platforms. However, there is also a debate in academic circles about the introduction of automation. Some scholars consider this tool to be important, while others point out that it has a negative impact on the quality of information. Accordingly, this aspect should be studied more.

Thus, modern scholars have characterised various technologies to ensure effective visualisation of media resources, but there are not many systematic reviews to date. Despite significant progress in studying the impact of media space design on audience interaction, significant issues still need to be solved or further research. In particular, based on the analysis of current works, the problem of using visual hierarchy and its impact on the perception of information in the digital media environment needs to be sufficiently studied. Another important aspect is the study of the role of algorithmic recommendations. Even though the personalisation of content using algorithms has been used for a long time, this problem still needs to be fully covered in the scientific literature and requires a deeper analysis. It is essential to determine the impact of algorithmic recommendations on user engagement. This study will address these gaps. Therefore, this paper will conduct a comprehensive systematic analysis of current scientific works and analyse the impact of visualisation and algorithmic recommendations on the formation of active interaction.

Methodology

Research Design

This paper is a qualitative study. This study is based on selecting modern scientific sources and their systematic analysis. The approach to the selection of sources was based on several important aspects. Scientific credibility (peer-reviewed works were prioritised), relevance (studies published within the last 4 years), thematic relevance (sources were selected based on content analysis), and geographical diversity (works by the authors were used for the analysis) were taken into account. This approach made it possible to form a professional, balanced sample of scientific materials that are representative and relevant to the research topic.

Materials and Equipment

The sample of this study included different types of scientific materials: monographs, book chapters, scientific articles, and conference materials. The study has no geographical focus, i.e., articles by authors from different regions were included. However, the main focus is on analysing exclusively English-language professional literature. This is done from the point of view that English is the primary language used in scientific publications in many international journals. Accordingly, this makes it an essential source of the most relevant works. A date range has been outlined for selecting sources: from 2020 to 2024. This was done to include relevant and up-to-date scientific literature on the selected topic. The criteria for including the literature were based on the analysis of such aspects as the language of writing (English),

content relevance to the topic, and the presence of a clearly stated research methodology. Both theoretical and empirical works were analysed.

Procedures

Data collection was carried out in stages using the Prisma approach. This scientific approach was chosen to screen the sources for this scoping review because it ensures a structured and transparent literature selection process. By adapting the Prisma method to the scoping review, the approach was used without a detailed assessment of the risk of bias, which is a necessary part of systematic reviews. Instead, the focus is on the stages of searching, selecting and analysing the selected materials.

Hence, the PRISMA is particularly suitable for a scoping review as it ensures a rigorous and transparent process in identifying and selecting literature.

First, the scientometric databases were selected to search the scientific literature. Google Scholar, Web of Science, and Open Alex were chosen for this study. The keywords used were media space, design, technology, interaction, audience, impact, results, ICT technologies, and visual communication, and they were entered into the above search databases. A total of 1100 results were obtained. The first stage of screening and identification involved the rejection of all duplicates (-159). After that, we analysed the titles and rejected those articles that did not correspond to the chosen research topic (-389). In this way, 552 results were obtained. Next, we analysed the keywords and abstracts and rejected those not responding to the study (-311).

This resulted in 241 sources that were subjected to the next stage of screening and included based on the following criteria:

1. The study focuses on the peculiarities of forming the modern media space with the involvement of various innovative technologies.
2. The study describes the collection tools (questionnaires, surveys, interviews, PRISMA) and data analysis methods (systematic review, comparative analysis, coding, transcription, etc.).
3. The paper includes research written in any language, provided it was valuable to the study and accompanied by an English-language summary.

Figure 1 shows the main stages of collection, identification and screening of found materials.

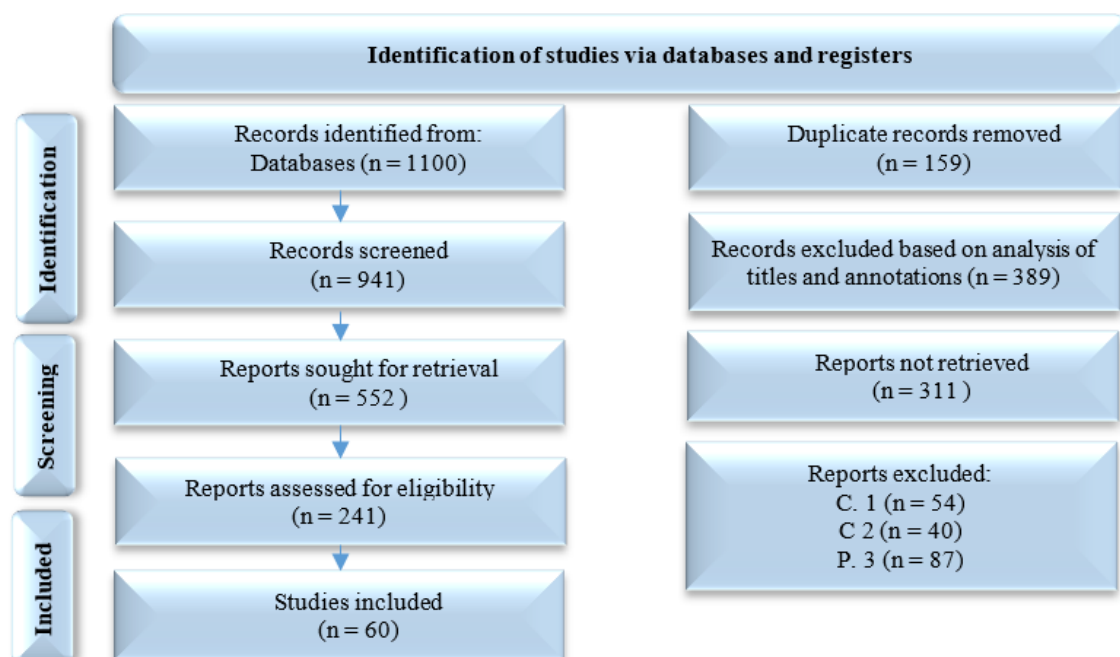


Figure 1. Identifying materials using the PRISMA approach.

Source: compiled by the authors

In this way, 60 items of scientific literature were selected for further systematic analysis.

Data Analysis

Qualitative analysis was used to process the data. In particular, Excel software was used for this purpose. Data such as the author, year of publication, technologies of media space formation, and conclusions were entered into specially created tables. This made it possible to codify the data in the necessary areas. This was done with the help of software. Excel was used for the primary codification and organisation of data. Excel made it possible to systematically record the key parameters of each source by such indicators as title, author, year of publication, and source type. The work's subject matter was also considered in the following categories: aspects of media design, trends, and impact on engagement. As a result, using Excel has become convenient for sorting and filtering sources.

VOSviewer was also used to analyse the data, as this tool provides visual diagrams that facilitate data interpretation. Thus, VosViewer was important for identifying the main categories and trends found in the selected scientific literature. This software was used to count the number of scientific papers on media design in 2014-2024 (according to the OpenAlex system). This made it possible to understand which design aspects have remained at the forefront of scientific research over the past 10 years and how they relate to other aspects of the media space (Appendix 1-2). Based on a comparative analysis, the results are compared with the works of other contemporary scholars. The results were compared by topic: conclusions on the effectiveness of using appropriate visualisation, algorithmic solutions, virtual reality or adaptive design were compared.

Results and Discussion

The emergence and spread of Internet technologies and communication channels (social networks, websites, various media resources) made it possible to create and distribute content of our production, to present it on various digital platforms, to interact quickly with the interested audience, and to make changes and corrections in real time. A feature of the former traditional information resources was the presentation of concentrated extracts according to certain unofficially approved stencils. This approach is gradually becoming a thing of the past, as the use of viral content in combination with built-in search algorithms on Internet sites creates a new type of information material and its "presentation". In addition, due to global transformations and the pervasive impact of digitalisation, many sources of information are being transformed into digital form, which implies its laws of interaction. In recent years, scholars' interest in studying the problem of forming an effective media space has increased significantly. As a result, new directions have influenced approaches to media space design, albeit in terms of personalisation, interface and usability. Their introduction and subsequent active use transformed the understanding of the interaction between the user and media content and the approach to design development and testing. In particular, based on the analysis of the OpenAlex platform, over the past 10 years, there has been a noticeable trend towards an increase in the number of scientific papers devoted to creating an effective media space (see Table 1).

Table 1.

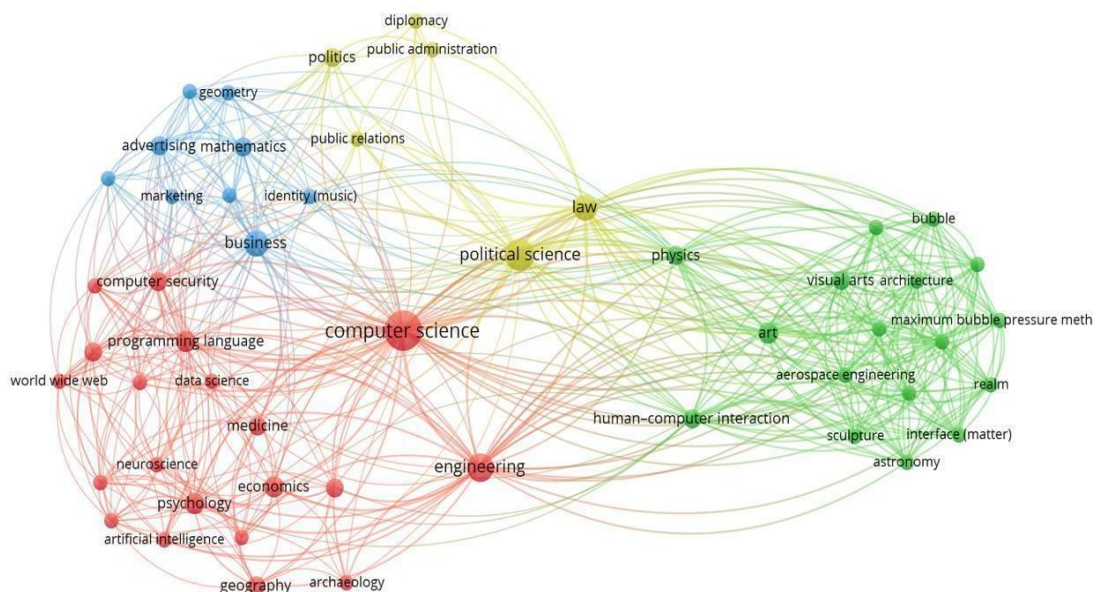
Number of scientific papers on the formation of effective media space design

Publication Year	N
2024	2522
2023	6936
2022	4774
2021	3849
2020	2999
2019	3169
2018	3008
2017	2644
2016	2445
2015	2090
2014	1823

Source: compiled by the authors

Research Topic	Count
Global Impact of Popular Culture	290
Transformative Potential of Blended Learning	298
Multimodal Literacy in Education and Society	463
Impact of Social Media on Well-being and Behaviour	476
Informal Learning in Science	487
Innovations in Visual Communication Design	545
The Spread of Misinformation Online	616
User Experience and Design Research in HCI	623
The Impact of Creative Industries	739
Media Framing and Agenda Setting in Communication	872
Impact of Social Media on Consumer Behaviour	1370
The Impact of Digital Media on Public Discourse	1889

Figure 1 does not include research areas with less than 250 papers. Researchers have noted various aspects of the impact of media space design on audience interaction in the digital age in the 2018-2020 timeframe. The focus was on computer science, artificial intelligence, programming, engineering, computer security, etc. Another block has a distinct public focus: political sciences, law, public administration, politics, diplomacy. The third block is less popular: physics, bubbles (as a social phenomenon), human-computer relations, art and its various branches. The fourth block covers business, mathematics, geometry, marketing, and other management and calculation categories. Establishing such relationships indicates the paradigms in which the problem of design's influence on audience activity in the digital space was understood (see Figure 1).



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This makes it possible to further identify changes in perceptions of the role of design. At the same time, the COVID-19 pandemic has impacted the use of digital technologies, which have become much more accessible and adaptable. The rapid digitalisation caused by the global pandemic has also affected how information is presented, as the number of platforms has increased significantly and they have begun competing. In modern media practice, there is a constant search for new formats of interaction with the audience and its interest, as well as updating content platforms. Such actions aim to retain the target audience of consumers on all possible digital platforms. Given that the sources of content have expanded significantly, researchers note the active development of visual support, which is aimed at creating a new integrated resource for the media culture of the future. The modern experience of using media is associated with screen culture, allowing new audiovisual images to form. As a result, today we are already talking about the integration of screen images into everyday life, which even indicates its dominance in real life, compared to the information that comes to us from other sources. In such circumstances, the design of media space impacts interaction with the audience, given the development of the digital age. The most recent data on the analysis of research interests indicate that media space design and its impact on audience interaction have undergone certain transformations. In particular, the four blocks established earlier have changed. Researchers still associate the field of media space design with computer science. However, this vector has become more clearly combined with the categories of mathematics and management, geometry, marketing, computer training and security, programming languages, etc. This evolution can be explained by further developing digitalisation provision, including computer knowledge (Kichurchak, 2023). Research ties with the fields of physics, computer-human relations, art, architecture, social bubbles, etc. have strengthened. At the same time, ties with the classical sciences (medicine, economics, geography, etc.), law, politics, and diplomacy have weakened significantly (see Figure 2).

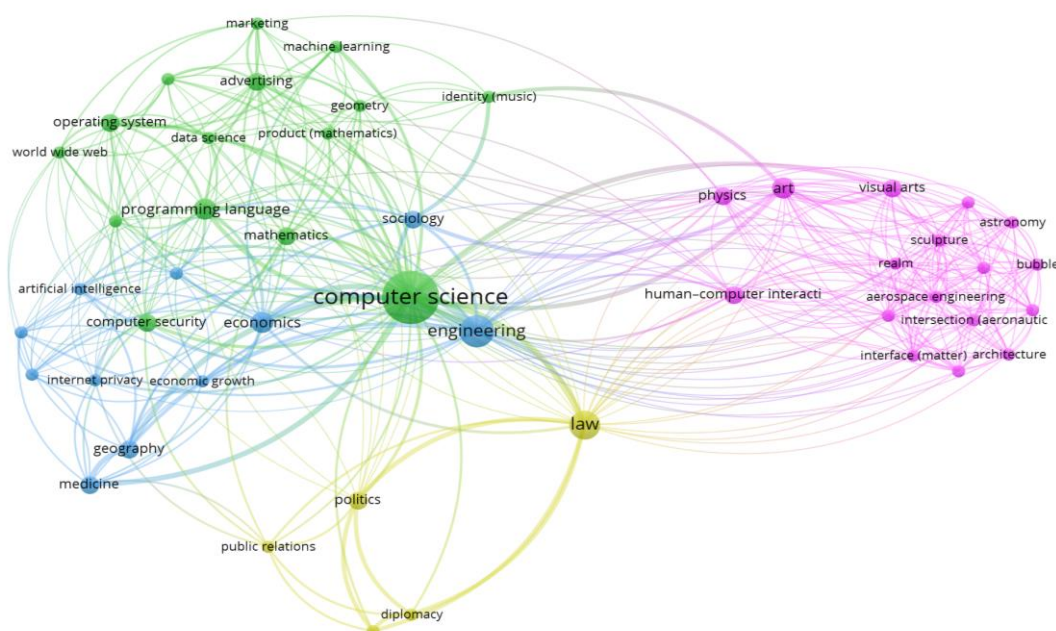


Figure 2. Areas of media research in 2021-2024 (according to the OpenAlex system)
Source: author's development

This suggests that the evolution of media design analysis will continue to be driven by engineering, computer science, and the interaction between humans and digital technologies.

If we consider only the area of media space design and the use of innovative technologies for the media space in 2020-2024, we see a smaller number of works (488 items). In addition, there is a noticeable trend towards an increase in the popularity of this topic in recent years (see Figure 2).

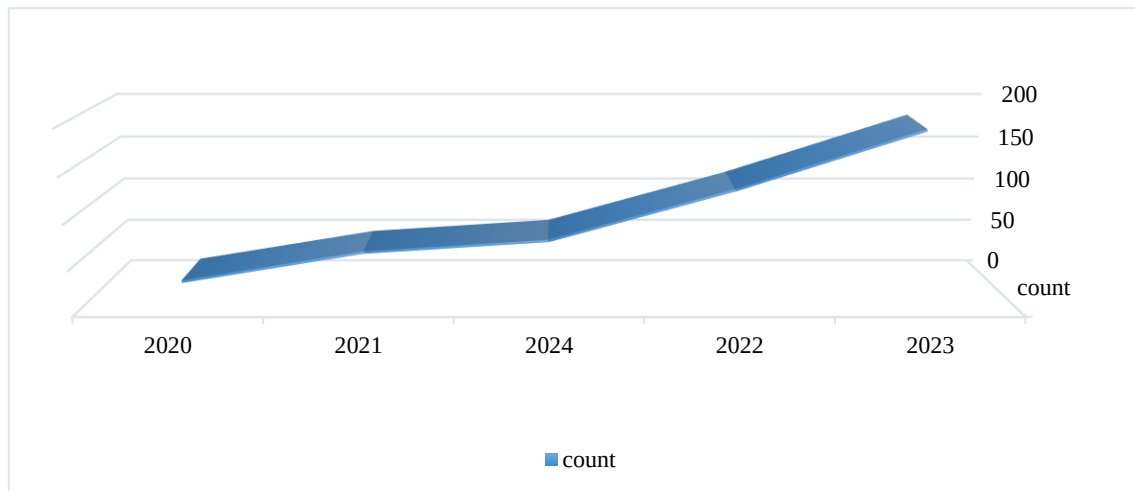


Figure 2. The dynamics of the appearance of scientific works on media design over the past 4 years.
 Source: compiled by the authors.

Researchers note the interactivity of the modern media space as an important tool for working with information, which has a positive impact on attracting a new audience of users, perceiving content and interacting with the source of information. Design, as part of interactivity, affects behaviour and social communication with users. One of the most important elements of design influence is external aesthetics, which is especially valuable when combined with usability. First of all, such visual elements as the choice of colours and fonts and the arrangement of elements on the monitor or display screen form a positive appeal that creates the appropriate mood (emotional state). In such circumstances, simple, modern interfaces that are intuitive and easy to understand significantly increase the time users spend on the platform and create the preconditions for further frequent interaction with media content. This approach is actively used in the social media sphere: X (formerly Twitter) or TikTok was created to distribute visual content that is aesthetically pleasing and easy to navigate. Interactivity tools also play a role (Wagner, 2022). Meta's products (Facebook or Instagram) allow you to comment, like, conduct polls, interact with the audience, and shoot and share short videos. In fact, it's not just about consuming information but also about actively creating it. Additionally, interactive design creates opportunities to turn a passive consumer into an active user who knows that he or she belongs to a community of other users.

Personalisation of the media space also implies the development of specific design requirements. Algorithms that select content based on preferences and general user behaviour create the effect of deeper immersion of the target audience in the established thematic niches. Responsive design allows media platforms to optimise the way content looks on different devices. The use of this technology allows for continuous and convenient access to information. New trends (AI and responsive design) have had a significant impact on approaches to media space design. Their active use has changed the understanding of the interaction between the user and media content. For example, accessibility has increased as responsive design has made content available on different devices with a focus on mobility. At the same time, the impact of artificial intelligence is based on content personalisation, which allows modern platforms to track and analyse user behaviour. This approach not only makes the user experience more convenient but also contributes to a greater audience reach, as modern studios have proven that responsive design makes users feel comfortable and accessible. However, it is also worth considering the technology of simple and logical UX. For this reason, easy navigation, clear content, and easy access to the necessary content contribute to creating a positive experience. Table 2 summarises the main technologies used in the digital age that can improve the interaction between media and audiences.

Table 2.
The main technologies used in media in the digital age

Technology	Brief description	Authors
External aesthetics Relevant and appropriate visualisation	High-quality visuals complement the text. Information becomes more understandable and visual.	Alonso Dos Santos et al. (2017) Khan et al. (2022) Kumar et al. (2020) Rodríguez-Vázquez et al. (2022) Sunarso et al. (2023)
Algorithmic technologies	Algorithms help to create individualised recommendations that increase the relevance of content	Ausat (2023) Rodríguez-Vázquez et al. (2022) Satterfield, & Abel (2020) Shirokova et al. (2023)
The current colour scheme	It plays an important role for a pleasant visual impression	Alonso Dos Santos et al. (2017) Kumar et al. (2020) Ma et al. (2021) Recker et al. (2020) Rodríguez-Vázquez et al. (2022)
Responsive design	Media platforms can optimise the way content looks on different devices	Bartschat et al. (2022) Jiang et al. (2022) Kumar et al. (2020) Li & Huang (2022) Mao & Jiang (2021) Rodríguez-Vázquez et al. (2022) Satterfield, & Abel (2020)
Interactive forms of interaction	Stimulate user engagement and increase audience loyalty.	Bartschat et al. (2022) Borysov et al. (2022) Byrko et al. (2021) (Corrales Compagnucci et al., 2021) García-Perdomo (2021) Hassan et al. (2024) Jiang et al. (2022) Leow & Ch'ng (2021)
Simple and logical UX	Easy navigation and easy access to the right content contribute to a positive experience	Greenhow & Chapman (2020) Hassan et al. (2024) Kumar et al. (2020) Macdonald (2021) Rodríguez-Vázquez et al. (2022)
Virtual reality	It allows you to analyse different objects, view them from different angles and interact with them.	Arrighi et al. (2021) Bangsa et al. (2022) Behl et al. (2023) Devadze & Gechbaia (2024) Kumar et al. (2020) Li & Huang (2022) Li et al. (2020)
Use of modern artificial intelligence technologies	It improves both visual and functional interaction. It creates personalised recommendations and allows you to analyse user reactions. Virtual assistants can support interaction	Bag et al. (2021) Greenhow & Chapman (2020) González-Mena et al. (2022) (Hedrick et al., 2022) Kumar et al. (2020) Li & Huang (2022) Li et al. (2024) Mao & Jiang (2021) Rodríguez-Vázquez et al. (2022) Satterfield, & Abel (2020)

Source: compiled by the authors

In addition, some researchers have emphasised the relevance of challenges in the ethical design of media platforms. The ethical aspect is essential because certain aspects of this phenomenon in the media space are the responsibility of designers, which directly affects the audience. The use of interfaces with notification elements that encourage users to interact with content and be present online continuously is dangerous due

to the potential for addiction. Thus, ethical digital design requires considering several requirements, including maintaining a balance between active interaction and ensuring that users have healthy contact with the content that does not lead to psychological discomfort or disorders.

Given the research problem, namely, determining the impact of media space design on audience interaction in the digital era, it is indicated that digital technologies, algorithmic recommendations, artificial intelligence, etc., have significantly influenced the functioning and development of media space. It is indicated that the transformation of the culture of the media space is greatly influenced by such a factor as consumer confidence in the source of information, and, accordingly, in modern media discourse, the source should have both visual appeal and high-quality textual material. These opinions correlate with the results of other scholars who have substantiated the importance of the external side (appropriate aesthetic environment, algorithmic recommendations, interactive forms of interaction) (Jin & Liu, 2022; Mariani & Fosso Wamba, 2020; Levin & Mamlok, 2021).

The study also quantifies the importance of this topic in the works of the last 10 years. The results demonstrate that scholars' interest in studying the problem of creating an effective media space has increased significantly in recent years. There is a noticeable trend towards an increase in the number of scientific papers devoted to creating an effective media space. The relevance of this topic is also indicated by the results of other scholars who discuss general trends in forming an effective media space (Vasudevan, 2020; Steenkamp, 2020). The article finds that popular topics include the impact of digital media on public opinion, the role of social media, media framing and agenda in communication, the impact of creative industries, user experience and design research, the spread of disinformation on the Internet, innovations in design and visual communication technologies, the impact of social media on well-being and behaviour, virtual presence and implementation in VR research, crisis communication and the use of social media, and others. These topics are popular in scientific research, as evidenced by the works of contemporary authors (Ye & Li, 2022; Larson & DeChurch, 2020; Sunarso et al., 2023).

An essential task of this study was to identify the leading effective technologies that help improve the interaction between the media and the audience. It was found that such means are visual aesthetics, which should be of high quality and visually appropriate. These thoughts are confirmed in other contemporary studies. According to Vasudevan (2020) and Wu et al. (2021), an important aspect that affects user interaction with the digital media space is visual hierarchy, which allows you to arrange elements on the screen in such a way as to draw attention to the most critical content. This helps the audience find the information they need quickly. Using techniques such as size, contrast, positioning, and colour, designers can create hierarchical relationships that guide the user through the content. Large headlines or bold accents can grab attention in the first place, after which the eye naturally follows the structure of the text and images (Turner et al., 2019). However, appropriate visualisation is also essential, as evidenced by many scientific studies. High-quality visualisation represented by graphs, images, videos and other materials complements the text. However, it should be relevant to the content to avoid creating misinformation. In this aspect, an important role is played by the relevant colour scheme, which contributes to the creation of a pleasant visual impression on the formation of the media platform's brand (Ye & Li, 2022; Larson & DeChurch, 2020).

The latter affects the emotional perception, engagement, and duration of interaction with the content. Other critical technologies are algorithmic recommendations, algorithmic technologies, and simple and logical UX. These opinions are also correlated with other works. According to Satterfield and Abel (2020), algorithmic recommendations are also influential in shaping media space design. Comparing the data obtained with the results of other researchers, there is a tendency to identify artificial intelligence, adaptive design, algorithms, and visuals as essential technologies for the formation of effective media space design (Larson & DeChurch, 2020; Jiang et al., 2022; Satterfield & Abel, 2020). Although this technology is recognised as relevant, its use has some challenges. First, personalised algorithms can lead to information bubbles, in which users interact almost exclusively with the thematic blocks limited by the algorithms.

Current research discusses that, in the long run, this may distort the perception of the world around us, as consumers may not receive alternative information (Jiang et al., 2022). However, this study also indicates that using these technologies (adaptive design, artificial intelligence, virtual reality, interactive and adaptive design) leads to certain changes in approaches to media space design. This aspect was emphasised more by other authors who pointed to the emergence of a massive integration of the data-driven approach. The design process has become more focused on data analysis (Ausat, 2023; Li et al., 2020). As a result, modern designers work much more closely with specialists in other fields (analysts) to study and understand those

interface components that effectively promote user engagement. This, in turn, allows interaction to be optimised based on real data. The study identifies the impact of the above technologies on user experience (UX) and real-time testing. The findings also correlate with other studies that have shown that the impact of AI on UX has led to the increased use of A/B testing to characterise the optimal arrangement of elements and their sequence based on the analysis of modern user behaviour (Granic et al., 2020). This allows you to customise the design according to changing preferences and quickly test which elements contribute most to user engagement. The article also points out the importance of using virtual reality and artificial intelligence technologies. The potential of these technologies is also pointed out by many modern scholars who identify both their strengths and weaknesses (Wu et al., 2021; Vainola, 2024). Thus, the theoretical value of this study is to prove that the design of media space is an important factor in shaping interaction with target audiences in social contact formation, which is especially important in the new digital era. This is due to the tools of external attractiveness, the ability to interact with information sources, personalisation and consideration of the ethical dimensions of interaction between people and the digital environment. These key factors create the preconditions for the success of various media platforms. The practical value of the work is that it can serve as an important basis for further research, in particular, conducting an empirical study to determine the most potential integrated and adaptive design for the digital media space. The main limitation of this study is the selection of only contemporary literature. In this way, the authors may have missed other important studies from previous years. Focusing on contemporary literature also limits this work to the context of the latest methods of media space design. Although this allows for an informative picture of current trends in media design, the paper may be limited in considering the evolution of approaches to creating effective design environments. At the same time, this limitation also makes it difficult to analyse the long-term results of introducing new technologies. Another important limitation is the choice of English-language literature. Accordingly, the study does not include works by authors of foreign languages. Digital technologies are used to form high-quality media discourse. This limitation contributes to the objectification of data analysis in the context of various cultural and regional peculiarities of perception of media design, which can be studied in scientific literature written in other languages. All of these limitations affect the results obtained, however, they do not diminish the value of this study.

Conclusions

Thus, scholars' interest in analysing the problem of creating an adequate media space using modern digital technologies has increased significantly in recent years. In particular, based on the analysis of the last 10 years, the dynamics of increasing the number of scientific works devoted to creating an effective media space system is noticeable. It is established that in modern media practice, there is a systematic process of searching for and developing new interaction formats with the audience and its interests. The use of digital elements has led to the expansion of the audience, for whom the visual design of the material has become as important as the content itself. The continued growth of the audience has raised the issue of competition, which affects more than the quantity of information messages as the quality, including the quality of design. As a result, more attractive visualisation helps to expand the range of users.

The contemporary experience of using media is associated with the so-called screen culture, which influences the creation of new audiovisual images. The formation of screen culture - the culture of consuming visual images from the screen of mobile gadgets - plays a unique role in this process. First, it is about creating an interactive environment that allows you to interact with visual content. Virtual and augmented reality tools are also necessary to attract users with new forms of interactivity. Thus, the design of the media space has an impact on audience interaction. The study identifies the main tools used in design that affect audience engagement: external aesthetics, appropriate and relevant visualisation, hierarchical visualisation, algorithmic technologies, relevant colour scheme, adaptive design, interactive forms of interaction, simple and logical UX, virtual reality and artificial intelligence. Their integrated use is aimed at an important goal - optimising user engagement. The study underscores the novel and transformative role of screen culture, characterized by the increasing dominance of visual consumption through mobile gadgets, in redefining media space design. It highlights the unique contribution of interactive environments, including virtual and augmented reality, in elevating audience engagement.

The study identified an important gap in the current body of literature: the lack of comparative assessments of the impact of different design approaches on audience engagement. This study provides an important foundation to fill this gap and is the basis for further empirical research that assesses the impact of technologies (such as artificial intelligence and interactive visualization) in a variety of media environments.

This study also opens up new areas for analysis. In the following studies, the authors will select one or more technologies and conduct a comparative analysis in the context of the effectiveness of audience engagement. The aim is to form an empirical basis for the study, allowing us to determine the importance of some aspects of user engagement using specific examples. Interactive interaction and artificial intelligence are effective when working on social media, which involves communication that automatic artificial intelligence algorithms can control. At the same time, working with other digital information sources will require an emphasis on simple and functional design, appropriate visualisation, and simple and logical UX, as user experience indicates a need to reduce visual noise.

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Modelling the impact of martial law on regional infrastructure and the role of public administration in its restoration

Modelización del impacto de la ley marcial en la infraestructura regional y el papel de la administración pública en su restablecimiento

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Abstract

The study aims to identify effective approaches to managing the processes of restoring regional infrastructure during martial law and post-war reconstruction. The type of this study is a case study based on the analysis of Ukrainian realities. The research procedure involved collecting scientific literature and expert opinions through semi-structured interviews. The inclusion of scientific literature was based on the following criteria: relevance, thematic relevance, time range from 2019 to 2024, regional criterion: Ukraine and the EU. The study involved 25 experts from various fields with experience in public administration. The main tool used in the study was a semi-structured interview that did not contain strict formal restrictions. The findings

Resumen

El estudio se centra en identificar enfoques eficaces para gestionar los procesos de restauración de infraestructuras regionales durante la ley marcial y la reconstrucción de posguerra, tomando como base un análisis del caso ucraniano. La investigación empleó una metodología cualitativa basada en la recopilación de bibliografía científica y la realización de entrevistas semiestructuradas con expertos. La selección de la literatura se realizó conforme a los criterios de relevancia temática, temporalidad (2019-2024) y regionalidad (Ucrania y la UE). En total, participaron 25 expertos con experiencia en restauración de infraestructuras y administración pública. Las entrevistas semiestructuradas, principal herramienta del estudio, permitieron obtener una visión profunda sin

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identify the optimal approaches to restoring regional infrastructure: creating strategies and implementing reforms, financial regulation, supporting businesses and implementing social projects, monitoring the situation and responding to challenges. The results, based on the analysis of experts' responses, established the following infrastructure problems of martial law for Ukraine: energy crisis (52%), destruction of social infrastructure (31%), reduction of the transport network (16%), problems in the functioning of information and communication infrastructure (1%). The conclusions indicate that an integrated approach should be implemented to develop the public administration system and restore the infrastructure.

Keywords: regional infrastructure, public administration, recovery, socio-economic changes, crisis management.

restricciones formales estrictas. Los resultados, basados en el análisis de las respuestas de los expertos, establecieron los siguientes problemas de infraestructura de la ley marcial para Ucrania: crisis energética (52%), destrucción de la infraestructura social (31%), reducción de la red de transporte (16%), problemas en el funcionamiento de la infraestructura de información y comunicación (1%). Sin embargo, se destacan importantes obstáculos, como la destrucción de infraestructuras de transporte, la crisis energética y los daños a la esfera social. El estudio concluye que un enfoque integrado es esencial para desarrollar el sistema de administración pública y lograr una restauración sostenible de las infraestructuras, considerando tanto los retos actuales como las perspectivas futuras.

Palabras clave: infraestructura regional, administración pública, recuperación, cambios socioeconómicos, gestión de crisis.

Introduction

General contextualization

Since the beginning of the full-scale invasion of Ukraine, the stable functioning of the state has become a challenge for state managers. The effectiveness and efficiency of public administration today are important issues that require in detail analysis and prompt resolution. The role of public administration has expanded and has become an important sector of ensuring the national security of Ukraine, especially in conditions of martial law.

One pressing research problem is the impact of martial law on regional infrastructure. This issue is particularly relevant in the context of the Russian-Ukrainian war, which has caused significant destruction to the economy and undermined social stability in affected regions. Studies reveal that energy systems, transport networks, and municipal infrastructure – key components of regional functionality – are among the sectors most severely affected during military operations.

Research problem

For this reason, public administration plays a crucial role in coordinating efforts to mobilise resources, restore damaged infrastructure, and attract international assistance. In this process, the formation of special strategies for sustainable development to return the regions to a successful and peaceful life is of great importance. On the other hand, several scholarly works argue that public administration under martial law has its own typical features and development mechanisms. Thus, they require a separate scientific analysis to develop effective proposals on the main priorities and directions for improving the efficiency of the country's governance in the face of Russian aggression. At the same time, in order to solve this complex problem, it is also necessary to adequately assess the current institutional changes taking place in Ukraine and identify a number of priority changes required by the management decision-making system and mechanisms for developing strategic plans at the regional level. In other words, rebuilding infrastructure after military conflicts requires the development and implementation of effective governance models that consider local needs and conditions and, most importantly, ensure transparency and sustainability of reconstruction processes. The main research problem is to identify effective approaches to restoring the regional infrastructure of Ukraine under martial law and post-war reconstruction and to analyze the impact of military actions on critical infrastructure and information and communication networks. In addition, it should also be recognised that the current system of public administration in Ukraine is facing particularly challenging conditions - the country is in the midst of a war, which is an important threat to national security. For this reason, highlighting the main factors affecting the effectiveness of public administration in wartime is now a particularly important task.

Objectives

Accordingly, *this study aims* to find effective approaches to managing the processes of regional infrastructure restoration during martial law and post-war reconstruction and to determine the role of local authorities, NGOs and the private sector in this process. For this reason, taking into account and studying these aspects will allow the restoration of infrastructure facilities and the formation of important theoretical and methodological foundations for further socio-economic development of the region.

Therefore, this study will be valuable for developing further strategic decisions in the field of regional infrastructure restoration, taking into account the maximum potential of public managers' capabilities.

Hypotheses of the article:

1. Engaging local communities and the private sector contributes to the sustainability of regional infrastructure.
2. Public administration is critical in restoring regional infrastructure during war.

Research questions:

1. What comprehensive approaches to regional infrastructure restoration can be identified?
2. What are the current infrastructure challenges facing martial law in Ukraine?
3. What is the role of public administration in the restoration of regional infrastructure?

Structure of the article

The structure of the article consists of an introduction, which outlines the main purpose of the article, namely to find effective approaches to managing the processes of regional infrastructure restoration during martial law and post-war reconstruction and to determine the role of local authorities and the main hypotheses, a literature review, which includes a critical analysis of scientific sources, outlining the main trends, debates and controversies in the literature. An important section is the methodology, which describes the involvement of 25 experts and the features of conducting interviews with them. The results present the main optimal approaches to restoring regional infrastructure: creating strategies and implementing reforms, financial regulation, supporting businesses and implementing social projects, monitoring the situation and responding to challenges. The conclusions summarize the information obtained and outline the following directions for research.

Literature Review

The problem of improving the mechanisms of public administration development in Ukraine has long received considerable attention from researchers. In particular, Buriak et al. (2023) identified the current problems of the public administration sector through the prism of modern globalist trends. Kutsyk et al. (2020) pointed out the critical aspects of the digital transformation of the public administration sector. In general, the digitalisation of governance in Ukraine is a common topic among scholars who have identified both the advantages and disadvantages of this process (Konovalchuk & Kovalov, 2023; Maslova & Mirko, 2023). Modern works present several modules of electronic interaction: between the state and citizens: G2C (Government-to-Citizen); between government and business G2B (Government-to-Business); between different branches of government G2G (Government-to-Government); between government and government G2E (Government-to-Employees). Since the beginning of the full-scale invasion, this problem has become even more intense in contemporary scholarship. Bohun et al., (2024) assessed the impact of Russian aggression on Ukrainian infrastructure. This study found that Ukraine's infrastructure was one of the areas most affected by the scale of the war. At the same time, there are separate discussions in the scientific literature on whether efforts should be directed towards restoring damaged facilities to their original form or modernizing them according to innovative sustainability standards. Those authors who argue for modernization point to aspects of restoration without significant renovation, since prolonged war increases the risk of repeated destruction. Also, those scholars who point to the importance of restoration believe that a quick return to functionality is more important than the introduction of new technologies in a crisis period.

Demotivating factors for investment activity are the destruction of production and industrial facilities, increased security and logistics, and, most importantly, the destruction of vital energy infrastructure (Bozhko, 2024; Iefimova & Pavlova, 2023). Such factors do not contribute to the effective implementation of investment activities. In particular, the destruction of production and industrial facilities during martial law is an essential problem for investment. The loss or damage of such facilities significantly increases business risks, as their restoration requires financial expenditures. Thus, martial law is one of the critical factors that demotivates investors in production and industrial facilities. The loss or damage to such facilities significantly increases business risks, as restoration requires significant financial costs and time and is sometimes impossible due to limited material and human resources. According to a study by Bohun et al., (2024), the estimated direct damage caused by the hostilities to Ukraine's infrastructure as of early January 2024 was about \$155 billion. The implementation of public financial policy in Ukraine is described in detail in the study by Chubka et al. (2019). The authors pointed out the importance of creating a State Innovation Bank that would provide preferential loans for creative ventures and exempt businesses from taxes in the event of a merger with a loss-making business (Chubka et al., 2019).

As a result, the state will help to create favourable conditions for the technical development of the industry and increase its ingenuity and attractiveness to investors. Therefore, the process of rebuilding infrastructure after the hostilities requires the development and implementation of effective management models that take into account local needs and conditions. For this reason, studies have pointed out that effective preventive measures are needed to prevent the collapse of the state during crises but also against the backdrop of major wars (Babaieva, 2023). Therefore, the main trends are increased attention to the resilience of critical infrastructure, the resilience of the energy sector, the role of decentralization in the reconstruction of regions. The events that followed Russia's military invasion of Ukraine in 2014 highlighted the particular need for a strategic response, as evidenced by a number of contemporary works (Brovko, 2024; Grynychuk et al., 2024; Gryshchenko et al., 2021). According to Brovko (2024), as a result of Ukraine's successful decentralisation reform, local governments have been empowered at the grassroots level, and state and local authorities have coordinated their efforts to stop Russian aggression. As a result, local administration was important for the survival of Ukrainian cities and villages after the full-scale Russian invasion in February 2022. However, some studies insist on the need for centralization of management decisions to coordinate resources. Therefore, there is a debate about the implementation of a centralized or decentralized management system (Safarli et al., 2024). Those who point to the importance of decentralization believe that this mechanism allows local communities to act more autonomously (Bobro, 2024).

Another scientific trend is the analysis of the integration of innovative experience, in particular, as can be seen from the literature review, the number of studies that analyze the experience of infrastructure restoration in other countries, which should be applied in Ukraine, is increasing (Gryshchenko et al., 2021; Bobro, 2024). An important area in modern studies has been the assessment of the difficulties faced by the public administration sector, which should be taken into account for post-war adaptation (Kalmykov et al., 2024; Kuczabski et al., 2023). In particular, scientists identify such factors as bureaucratisation, lack of funding, corruption, difficulties in the digital transformation system, the influence of political factors, and information challenges (Demikhov et al., 2020; Yusifov, 2024).

However, the studies under review cover these difficulties superficially, and the authors do not pay due attention to a broader analysis of these challenges. In particular, it is important to describe not only general state problems but also to clearly identify the main infrastructural challenges of martial law for Ukraine. This paper will try to address this gap using not only theoretical analysis of works but also expert opinion.

Methodology

Research Design

The type of this research is a case study, which involves an in-depth study of the chosen topic, taking into account expert opinions. The case study has several important aspects that are essential for analysing regional infrastructure in times of war. This applies to both the in-depth study of the research problem and the contextual approach. In particular, case studies allow for immersion in the specific context of the region, taking into account the unique factors of war. The case study approach allowed for an in-depth analysis of the impact of martial law on regional infrastructure and the role of public administration, which made it possible to characterise the dynamics and specific aspects of the problem under study. The study uses a comprehensive approach to collecting and processing information, including analysis of certain legislative

documents and survey data. Therefore, this approach is important for this study, as it allowed us to obtain valuable information that may be lost in theoretical or purely empirical studies.

Materials and Equipment

Expert group

A purposive sample was selected to involve experts in the study. Information about the recruitment of participants was disseminated on social media. This information dissemination tool was chosen because it allows potential participants to learn about the main purpose of the study remotely. The selection of the main inclusion criteria for analysing the processes of infrastructure recovery in the war was based on their relevance to the research objective and their potential to identify key factors that affect the effectiveness of reconstruction in a crisis situation. In turn, the inclusion criteria covered the following aspects:

1. Experience in public administration, participants must have at least 3 years of experience.
2. Providing informative consent to data processing.
3. Participants must understand and identify the main challenges in rebuilding infrastructure.
4. Experts from different regions of Ukraine, including those most affected by hostilities, will be involved.
5. Participants must consent to the processing of personal data.

Experts were identified through purposive sampling. They were invited to participate through professional networks and academic institutions. In this way, 31 potential experts were identified. However, 4 of them refused to provide informed consent, and another 2 refused to undergo semi-structured interviews.

In total, 25 experts from various fields with experience in infrastructure recovery and public administration took part in the study. The study includes representatives from local governments, construction companies, NGOs and international governance experts (see Table 1).

Table 1.
Demographic data of the experts involved in the study

H	Gender	Age	Education	Specialisation (for now)	Position	Region of operation
1	Ч	46	Engineering	Transport infrastructure	Chief Engineer	Kyiv region
2	Ч	38	Management	Local self-government	Director of the department	Lviv region
3	Ж	47	Economic	Finance	Manager	Odesa region
4	Ч	52	Economic	Infrastructure financing	Expert of the international foundation	Odesa region
5	Ж	29	Sociology	Civil society	Project coordinator	Kharkiv region
6	Ч	60	Ingerne	Construction and architecture	Chief architect	Kharkiv region
7	Ж	34	Public administration	Public administration	Advisor	Mykolaiv region
8	Ж	48	Ecology and engineering	Energy and renewables	Head of the department	Vinnitsia region
9	Ч	33	Engineering and ecology	Energy and renewables	Secretary	Vinnitsia region
10	Ч	31	Management	Local self-government	Secretary	Lviv region
11	Ж	42	Political Science	Humanitarian aid	Programme coordinator	Zaporizhzhya region
12	Ж	26	International relations	Diplomacy	Secretary	Kyiv region
13	Ч	47	Engineering	Transport infrastructure	Chief Engineer	Sumy region
14	Ч	51	Management	Local self-government	Director of the department	Lviv region
15	Ч	33	Economic	Financing infrastructure	Expert of the international foundation	Odesa region
16	Ж	41	Ecology and engineering	Energy and renewables	Head of the department	Vinnitsia region
17	Ч	31	Management	Local self-government	Secretary	Dnipropetrovsk oblast

18	Ч	50	Architectural	Architecture and planning	Architectural consultant	Poltava region
19	Ж	32	Management	Project management	Project manager	Kyiv region
20	Ч	55	Economic	The economy of recovery	Deputy Director	Cherkasy region
21	Ч	36	Public administration	State security	Security advisor	Kyiv region
22	Ж	47	Historical	Social work	Head of social service	Sumy region
23	Ж	28	Ecology	Environmental Service	Environmental assessment expert	Zhytomyr region
24	Ч	34	Historical	State security	Security advisor	Kyiv region
25	Ж	44	Law	Legal organisation	Lawyer	Rivne region

Source: compiled by the authors

Expert opinions have become important in identifying key factors affecting infrastructure restoration and identifying effective mechanisms in this process.

Materials of scientific research and legislative acts

The research involved various sources: scientific articles, monographs, chapters from monographs, etc., and legislative acts. The study used a criterion-based sample. The sample was formed by considering aspects such as relevance to the research topic, content, and the availability of a research methodology. Language: English and Ukrainian. Timeframe: 2019-2024. This was done to include the most relevant scientific literature and legislation.

Procedures

The research procedure was a step-by-step process involving processing material from scientific studies and expert interviews. Google Scholar was used to search for sources. Keywords such as: regional development, wartime, Ukraine, public policy, challenges, difficulties, and recovery were entered into the search database. The system also selected the type of research: review articles. A total of 967 items of scientific literature were found. The inclusion criteria were based on the following aspects:

1. Thematic relevance. The research should relate to the functioning of public policy in Ukraine.
2. Region: Ukraine and Europe. Inclusion of research that is primarily relevant to Ukrainian realities.
3. Time range: from 2019 to 2024 This was done to ensure that the literature is up-to-date and relevant (-516 results).
4. Availability of research methodology. The study should specify the methods and approaches for data processing.

Using these 4 criteria, 42 items were found in the scientific literature, international reports, and legislation (see Table 2).

Table 2.
Search and collection of relevant literature

Criterion	Initial number of articles	Excluded results	Quantity after selection
Thematic relevance	967	-213	754
Regional relevance (Ukraine, EU)	754	-167	587
Time frame (2019-2024)	587	-516	71
Availability of the research methodology. Information on methods and approaches to data processing	71	27	44
Overall			44

Source: compiled by the authors

Interview

The research procedure consisted of collecting expert opinions through semi-structured interviews. This tool was chosen because the interviewees were able to express their own opinions. Unlike closed-ended surveys, semi-structured interviews had no restrictions on participants' answers. The interviews were

conducted remotely using the Zoom platform. The questions concerned different approaches to public administration, analysis of the current situation, and characterisation of certain difficulties.

1. What changes did public policy undergo during martial law?
2. What are the most effective approaches to rebuilding regional infrastructure?
3. What are the most pressing infrastructure challenges facing martial law in Ukraine?
4. What is the role of public administration in rebuilding regional infrastructure?

Special discussion focus groups (5 people each) were also organised. In these groups, experts were able to discuss interrelated issues affecting the speed and quality of restoration work. The topic of this roundtable was: "Challenges and Prospects for Public Policy and Infrastructure Restoration under Martial Law". This topic synthesised key issues related to changes in public policy and effective approaches to restoring regional infrastructure in Ukraine.

Thus, in this step-by-step manner, the relevant literature was collected, and a survey was conducted among experts.

Data Analysis

Qualitative interview data were transcribed and coded. Transcription was done manually by reviewing the Zoom recordings several times. The study used NVivo software to systematically code and generate themes. Excel software was used to analyse the data. The use of this software for data processing in the study is due to its versatility and ease of use. In addition, this programme has a wide range of functions for analysing and visualising information. Data such as the author, title of the publication, year of publication, and conclusions are included in the first table. This made conducting a content analysis of the scientific literature possible to form a holistic picture of best practices in recovering regions after military conflicts. After that, another table was made: expert number - main statements - voting results. This allowed us to summarise the experts' opinions. The data obtained was subjected to a comparative analysis based on the opinions stated in the scientific literature. To carry out this comparative analysis, the following components were taken into account: challenges (destruction of transport infrastructure, critical situation in the energy sector, need to restore the housing and utilities sector and the communications industry), roles (distribution and coordination of resources, establishing partnerships with international funds and organisations, transparency in the work of government agencies).

Results

The war has destroyed infrastructure facilities at the national and regional levels. The destruction not only creates additional difficulties in ensuring the country's defence capability but also affects the socio-economic situation in Ukraine. Using public administration tools in such circumstances determines the best approaches to recovery: strategy development and reforms, financial regulation, business support and social projects, monitoring the situation and responding to challenges. It is necessary to formalise its functions to improve the efficiency of the government's functions in the public administration system. Increasing the efficiency of the bureaucracy, improving administrative procedures, and raising the professional level of ministries and agencies will help the government to perform its tasks better and take on additional responsible functions. However, the risks of concentrating power in the government should also be considered. Thus, decentralisation is needed to balance powers, ensure transparency, and avoid excessive centralisation of power. Attention to the regions in times of martial law is no less important than to the structure of the central government (Figure 1).

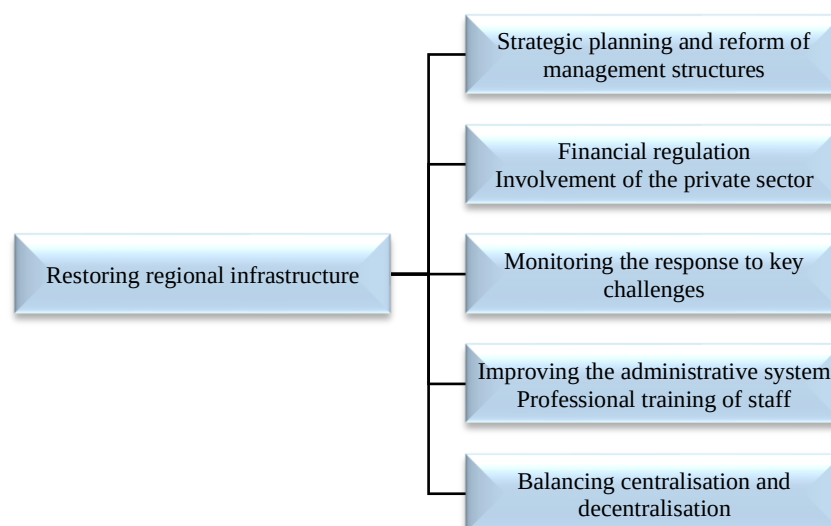


Figure 1. Integrated approaches to regional infrastructure rehabilitation.

Source: compiled by the authors

Accordingly, the decentralisation of recovery processes (12 expert votes, 48%) allows for the rapid and efficient identification of local needs that can be addressed using local resources. This makes it possible to increase the efficiency of management, as local authorities know the specifics of their region's development. The use of proactive strategies (8 expert votes, 29%) is aimed at the rapid restoration of critical infrastructure facilities in a period when active hostilities have recently ceased. Taking into account investments in technological solutions (5 expert votes, 23%) contribute not only to the restoration but also to the modernisation of damaged regional infrastructure. Each strategy has its own speed of application, consideration of resilience to possible future threats, and calculation of economic feasibility. Obviously, these aspects also need to be taken into account when modelling the impact of martial law on regional infrastructure.

The proposed modelling makes it possible to outline the complex impact of the martial law imposed in Ukraine. First of all, we are talking about the impact on the functioning of various infrastructure sectors and the possibility of predicting long-term consequences for each sector. Based on the study of scientific literature, the main problems in the functioning of infrastructure caused by Russian aggression have been identified (see Table 3).

Table 3.
Infrastructure challenges of martial law

Challenge	Problem
Destruction of transport infrastructure	1. The war has caused enormous damage to road transport. The destruction of roads and bridges has made moving goods, supply chains, passenger transport and logistics difficult. 2. Losses to the railway infrastructure are not as critical, although key junctions have been damaged, significantly reducing the capacity of export and import operations. Problems with rail transport slow down national GDP growth (Yevsieiev et al., 2024). 3. Air transport has not been used for passenger transport for a long time. The maritime transport infrastructure has been critically damaged. Port areas are frozen, significantly reducing Ukraine's economic opportunities (Restoration of Ukraine, n.d.)
Energy crisis	1. During the war, electricity grids suffered enormous losses in transportation and, most importantly, production capacity. Interruptions in power supply and restrictions on access to electricity reduce the quality of life and the production capacity of the national economy (Yevsieiev et al., 2024) 2. Many regions' Gas (transport and production) infrastructure is severely damaged or destroyed. This challenge is extremely relevant for energy security and increases dependence on external electricity supplies. 3. The loss of coal mines leads to a new arrangement of energy, metallurgical, light and other industries (Steffen & Patt, 2022).

Destruction of social infrastructure	1. The destruction of schools, public services, hospitals, and residential buildings is the reason people are moving to safer regions or abroad. The destruction of social infrastructure makes it impossible to return to the affected areas, which are thus in a state of social crisis (Restoration of Ukraine, n.d.). 2. The destruction of social infrastructure also leads to difficulties in functioning the municipal infrastructure. On the one hand, there is a problem with water supply and sanitation problem in the affected areas, which threatens public health. The lack of heat generation is a critical problem for urban centres (Verkhovna Rada of Ukraine, 2020).
Problems with the functioning of the information and communication infrastructure	1. The loss of telecommunications infrastructure leads to problems with communication and the operation of relevant services. Complicates communication between regions and disrupts the operation of relevant services (Chugunov et al., 2023). 2. The destruction of the Internet connection and the loss of mobile communications infrastructure are sensitive for economic activity, telecommuting, telecommuting, etc. The need for more reliable sources of communication hampers production and business structures.

Source: compiled by the authors

Although Russia's aggression against Ukraine has become the largest conflict in Europe in the 21st century, similar problems have already been encountered in other states that have found themselves in the epicentre of hostilities. The experience of Israel, which is under constant pressure from Arab countries, is illustrative. The practice introduced in Croatia, which was recovering from the Serbian aggression in the 1990s, should also be considered. With this in mind, the experts were asked to identify the most pressing challenges for Ukraine's infrastructure. The results are presented in Table 4.

Table 4.
The most pressing infrastructure challenges of martial law for Ukraine

Nº	Challenge	Number of expert votes (max - 25, 100%)	Some remarks drawn from the in-depth interview
1	Energy crisis	13 (52%)	Expert 1: The destruction of the energy infrastructure exacerbates the problem of dependence on imported energy resources. Expert 4: The massive destruction of energy networks will require a priority response. Attention should be paid to the regions that have suffered the greatest losses. Expert 5: Energy networks need not only restoration but also modernization. Expert 17: There is a need to take into account the possibility of a new Russian offensive, so increasing the resilience of energy facilities to attack is an extremely important task. Expert 23: Development of alternative energy sources, decentralisation of energy sector management and dispersal of energy facilities - a way to ensure energy security.
2	Destruction of social infrastructure	7 (31%)	Expert 2: The massive resettlement of people from dangerous or war-torn regions creates a problem of population decline in some areas, and vice versa - increases overpopulation in areas that are safer for life. Expert 13: One of the top priorities for government officials is to restore the social infrastructure of war-affected areas. Expert 15: There will be a problem with the temporarily occupied territories. One of the regional challenges is to ensure an adequate standard of living for the temporarily displaced persons so that they do not leave the territory of Ukraine.
3	Destruction of transport infrastructure	4 (16%)	Expert 10: Restoration of road infrastructure, railways, and airports are significant social and psychological markers of the country's recovery. The attention of state managers to this area is significant. Expert 20: Reconstruction of the logistics infrastructure is a priority, but it will require attracting financial resources that would be explicitly used for reconstruction. Expert 24: Regarding its importance in the country's economy, road transport is inferior to rail transport. Air transport is not as relevant for recovery. Expert 25: Public administration in the reconstruction of transport infrastructure should also address the issue of combating corruption. Rebuilding roads is a long-standing corruption problem for the Ukrainian authorities.
4	Problems with the functioning of the information and communication infrastructure	1 (1%)	Expert 6: When it comes to ensuring the sustainable operation of the information and communication infrastructure, there is a need to increase the role of alternative mobile communication channels. A possible option is to develop and implement a strategy of backup capabilities in the field of mobile communications.

Source: created by the authors

Therefore, experts pointed out the importance of overcoming the challenges in the following order: working on the consequences of the energy crisis, rebuilding the destroyed social infrastructure, restoring transport infrastructure, and solving problems with the functioning of the information and communication infrastructure. The survey also identified some crucial markers: overcoming energy dependence, decentralisation of energy management, new location of energy facilities that will take into account the security factor, the role of public administration in restoring housing and communal services, implementation of the transport infrastructure rebuilding project, overcoming corruption challenges, and work to ensure stable communications. Accordingly, public administration will have a role to play in restoring regional infrastructure. The results of the survey are shown in Table 5-6.

Table 5.

The role of public administration in the restoration of regional infrastructure

Role	Characteristics
Allocation and coordination of resources	Given that the state must ensure centralised control over financial expenditures and technological support for the restoration of critical facilities, there is a need to pay more attention to public administration tools in this area (Tytykalo et al., 2022; Jarvis, 2023)
Establishing partnerships with international foundations, organisations, etc.	Rebuilding Ukraine is a costly process that the war-torn Ukrainian economy will not be able to undertake on its own. For this reason, there is a clear need to raise funds from international partners, primarily the United States and the European Union (Anghel & Jones, 2023). This is not only about the financial resources needed for reconstruction, but also about technological cooperation that will allow for the restoration of war-affected regions (Yevsieiev et al., 2024)
Transparency in the work of state institutions	The use of transparent mechanisms of work and reporting becomes a guarantee of fair use of funds (Petrukha et al., 2024). It is also important to increase the trust of Western partners.

Source: compiled by the authors of the article on the basis of scientific literature

Therefore, the content analysis of the scientific literature and the Recovery Plan for Ukraine has pointed to the need to implement operational solutions that will restore Ukraine's regional development, ensuring the stability of regional systems in the future. Scientists' attention is focused on the relevance of resource allocation and coordination, establishing partnerships with foreign donors (according to the Recovery Plan, the cost of all projects will be more than USD 700 billion), and the transparency of public authorities), and transparent work of public authorities. Experts were asked to identify the most relevant roles, which are shown in Table 5, along with some comments.

Table 6.

The role of public administration in the restoration of regional infrastructure (expert assessment)

№	Role definition	Number of expert votes (max - 25, 100%)	Some remarks drawn from the in-depth interview
1	Transparency in the work of state institutions	12 (48%)	Expert 2: Transparency in work is a unique tool for restoring trust in the government in the post-war reconstruction Expert 22: According to the State Strategy for Regional Development, the main task of reintegration is to restore the public administration system in the de-occupied territories and ensure its sustainability. Transparency is one of the pillars of sustainability along with security.
2	Allocation and coordination of resources	10 (40%)	Expert 4: An important aspect is the work with human resources, in which public administration plays a significant role.
3	Establishing partnerships with international foundations, organisations, etc.	3 (12%)	Expert 10: Establishing contacts with foreign partners is only partially within the sphere of influence of regional authorities and, accordingly, regional public administration. The position of the central government in this matter is much more important.

Source: created by the authors

Therefore, the role of public administration in the restoration of regional infrastructure is considered to be quite high. Experts say that ensuring the transparency of public institutions is one of the most important elements.

Discussion

Based on the research problem, namely determining the impact of martial law on regional infrastructure and the importance of public administration in the restoration process, it was found that the reform process is important to optimise the management process. The survey of experts indicates the importance of governance reforms: strategy development and reforms, financial regulation, business support and social projects, monitoring the situation and responding to challenges. These findings are consistent with the work of other academics who have highlighted the necessity of implementing creative solutions in the public administration system, especially those that draw from advancements in digitalization (Melnychuk & Voinalovych, 2023). According to the studies, under these situations, government personnel play a crucial role as the primary players in public administration (Lohvynenko & Savenko, 2019; Kozlovskiy et al., 2024). This study shows, however, that such a development may involve the risk of a monopolization of the government, which could start to disregard the efficiency and public interest of judgments in favor of its own. Decentralization of the recovery process is therefore crucial, according to the study (48% of experts said so), which enables the qualitative identification of local needs.

It also confirmed the 1st hypothesis of the study, which was that involving local communities and the private sector contributes to the resilience of regional infrastructure. This is also identified in other studies, which indicate that decentralisation allows for more effective governance, as local authorities know the specifics of their region's development (Pukhtynskiy, 2020; Tytykalo, 2023; Kumar, 2024). In addition, the results also correlate with a comparative analysis of sociological studies organised by the Kyiv International Institute of Sociology in 2021-2023 to determine the level of public trust in the functioning of local government (Okunovska & Prymush, 2024). The study showed a stable positive support for the activities of local authorities by citizens. Thus, this indicates a positive attitude of Ukrainians towards decentralisation reforms, even though during the military invasion, some processes of constitutionalisation of the decentralisation system were suspended (Okunovska & Prymush, 2024; Kliuchnyk, 2023; Olzacka, 2024).

However, the results, which emphasized the necessity of strategic planning, align with the suggestions made in World Bank publications on the rehabilitation of infrastructure in crisis situations (World Bank Group, 2023). According to the World Bank research, the system of infrastructure development under crisis conditions necessitates flexible funding and management mechanisms in addition to clear strategic planning. The study's conclusions also highlight the necessity of a flexible strategy that acknowledges the value of both professional centralization and decentralization. The study also identified the main infrastructure challenges of martial law for Ukraine: the energy crisis, the destruction of transport and social infrastructure, and problems with the functioning of the information and communication infrastructure. At the same time, the experts pointed out the importance of addressing the challenges in the following order: resolving the energy crisis, rebuilding the destroyed social and transport infrastructure, and solving problems with the functioning of the information and communication infrastructure. Thus, the study found that the highest priority is to resolve the energy crisis and rebuild social and transport infrastructure. These results also correlate with the World Bank's reports and individual studies that emphasise the importance of addressing energy, transport and infrastructure problems in regions affected by military operations (World Bank group, 2024; Sheludiakova et al., 2021; Lavrov et al., 2022). It also confirmed the 1st hypothesis of the study, which was that involving local communities and the private sector contributes to the resilience of regional infrastructure. The study also identifies a particularly important role of public administration in restoring regional infrastructure. This confirms the 2nd hypothesis of the study, which was that public officials played a critical role in the reconstruction of regional infrastructure during the war. The role of public administrators concerns such important aspects as the allocation and coordination of resources, the establishment of partnerships with international funds and organisations, and transparency in the work of public institutions. This also coincides with the UNDP's research, which states that when rebuilding infrastructure in crisis regions, successful projects must demonstrate a clear accounting of financial and material resources (UNDP in Ukraine, 2024; Safarli et al., 2024).

The study also identified the importance of implementing international partnerships in the recovery system. This is also in line with the studies by Kuzmenko et al. (2023), who highlighted the role of international partnerships in attracting funding and knowledge exchange. However, these results confirmed that cooperation with international organisations helps obtain financial and technical support. The latter is particularly valuable for regions affected by war or with limited resources. The results also highlight the importance of transparency. This is also in line with other recent work that has indicated that a system of public scrutiny is an important component for successful recovery in the context of regional development

(Petrukha et al., 2024). Implementation of transparency is important in restoring trust, as working with financial flows and public control over their use will increase public trust in state institutions in general. To summarise the study's theoretical significance, we draw attention to an integrated approach to developing the public administration system to restore the infrastructure system. The latter should enhance the process of efficient resource allocation, sustainable international partnerships, and transparency. However, this study also has certain limitations. First, as this paper is a case study, it considers local Ukrainian specifics. Thus, it is difficult to interpret these results for other countries or regions affected by wars. A notable limitation was the choice of English and Ukrainian literature, which means that the study does not consider the works of foreign language authors that present the realities of infrastructure reconstruction.

Conclusions

The war poses challenges to regional infrastructure and has a noticeable impact on energy systems, transportation networks, social facilities, and information and communication technologies. The respondents noted the importance of public administration in restoring regional infrastructure. The survey also identified certain markers of public managers' involvement: reducing energy dependence, decentralising energy management, re-locating energy facilities to take into account the security factor, the role of public management in restoring housing and communal services, implementing a transport infrastructure rebuilding project, overcoming corruption challenges, and working to ensure stable communications. Accordingly, public administration will have a role to play in rebuilding regional infrastructure. Experts say that ensuring transparency in the functioning of public institutions is one of the most important elements. However, the issue of resource allocation and control is only a few points behind transparency.

The study highlighted that public administration needs to evolve to effectively address the challenges of war and post-conflict recovery and focus on principles such as adaptability, transparency and local stakeholder engagement.

Therefore, this study contributes to the field of public administration and post-conflict recovery by:

1. Identifying key priority areas where public administration can improve resilience and efficiency in infrastructure recovery.
2. Stressed the importance of decentralized energy systems and regional planning that should be geared towards adapting to local security needs.

However, this study also opened up new areas of research.

1. Future research should focus on broader community engagement. In particular, effective models for engaging local communities and the private sector in infrastructure restoration should be explored.
2. Since this study was largely focused on domestic transformations, the researchers missed the aspect of international cooperation. Therefore, the next area for analysis is the role of international organizations and donor agencies in supporting Ukraine's post-war reconstruction.

These findings and recommendations are aimed at ensuring that public administrators continue to use effective, reliable, and transparent strategies for restoring Ukraine's regional infrastructure.

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Cross-cultural communications in shaping the cultural image of Ukraine in the international information environment

Кроскультурні комунікації у формуванні культурного іміджу України в міжнародному інформаційному середовищі

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Abstract

This research aims to highlight the importance of Ukrainian culture within the international information environment. The cross-sectional survey study involved purposive sampling of 28 participants whose attitudes towards Ukraine's cultural image and diplomacy were evaluated. The findings showed that cultural image belongs to the international information environment, and Ukraine is characterised by its ability to counteract several external pressures. The research resulted in the development of effective mechanisms to form Ukraine's positive cultural image internationally, including long-term cultural diplomacy oriented towards deeper collaboration with other nations, the global dissemination of accurate narratives about Ukraine, and the counteraction of stereotypes or misinformation. The authors described the challenges of forming Ukraine's positive image in detail. The article demonstrated that it is essential to differentiate Ukrainian culture from external influences, such as the Soviet-era discourse and modern Russian narrative. The research admitted that spreading the facts about Ukraine will help build the country's cultural image in the international information environment. Besides, the research resulted in the development of effective mechanisms to form Ukraine's positive cultural image internationally. The study outcomes can be used to elaborate on long-term cultural diplomacy oriented towards deeper collaboration with other nations, the global dissemination of accurate narratives about Ukraine, and the counteraction of stereotypes or misinformation.

Анотація

Мета дослідження – продемонструвати важливість висвітлення української культури в міжнародному інформаційному середовищі. Під час крос-секційного опитування було залучено 28 учасників для оцінювання їхніх поглядів на культурний імідж України та дипломатію. Результати показали, що культурний імідж є складовою міжнародного інформаційного середовища, а Україна характеризується здатністю протидіяти численним зовнішнім впливам. У ході дослідження були розроблені ефективні механізми формування позитивного культурного іміджу України на міжнародній арені, зокрема довгострокова культурна дипломатія, спрямована на глибшу співпрацю з іншими країнами, глобальне поширення достовірних наративів про Україну та протидія стереотипам або дезінформації. Авторами статті продемонстровано важливість диференціювання української культури від зовнішніх впливів, які зумовлені, перш за все, дискурсом радянської доби, а також сучасним російським наративом, в якому поширене використання неправдивих стереотипів та дезінформації про українську культуру. У дослідженні доведено, що поширення реальних фактів про Україну допоможе побудувати культурний імідж країни в міжнародному інформаційному середовищі. Крім того, результатом дослідження було визнано розробку ефективних механізмів формування позитивного культурного іміджу України на міжнародному рівні. Результати дослідження можуть бути використані для розробки стратегій довгострокової культурної дипломатії,

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Keywords: International relations, cultural diplomacy, media, national brand, globalisation, socio-cultural trends.

орієнтованої на поглиблення співпраці з іншими країнами, глобальне поширення точних наративів про Україну та українську культуру, а також імплементацію методів протидії стереотипам чи дезінформації.

Ключові слова: Міжнародні відносини, культурна дипломатія, медіа, національний бренд, глобалізація, соціокультурні тренди.

Introduction

General presentation of the topic

Currently, cross-cultural communication shapes the perception of nations within the global information landscape. For Ukraine, effectively conveying its cultural heritage and values is essential to building a positive image internationally. Obviously, when dialogue and collaboration across cultures are fostered, Ukraine strengthens its presence and counteracts stereotypes or misinformation in the international arena. In this context, it is important to interpret the main concepts related to the research problem and outline their characteristics in detail.

The international information environment is a key concept of the research. It refers to rapid digitisation, the dominance of social media, and the increasing role of artificial intelligence in shaping information (Wardle & AbdAllah, 2023). The modern information environment encompasses all spheres of society, influencing politics by shaping public opinion and enabling digital diplomacy using social media (Kryvoshein, 2023). It integrates medicine through telemedicine platforms and health data analytics (Yuryk et al., 2022). It drives e-learning innovations and online collaboration in education, underscoring its pervasive role in societal development (Prokopenko & Sapinski, 2024). The information environment significantly impacts the financial sector by shaping market perceptions and influencing investor behaviour (Sunduk et al., 2024).

At the same time, this environment affects culture and cross-cultural relations, promoting the global exchange of traditions, art, and values through media (Dobrolyubska et al., 2024). It also fosters dialogue between diverse cultures since it amplifies cultural diplomacy and addresses stereotyping (Wardle & AbdAllah, 2023). A country's cultural image is an integral component of the international information environment, as it is expressed through media, art, tourism, diplomacy, and public perception, all caused by information dissemination (Tereshchuk, 2019).

Ukraine's cultural image reflects how the country is understood through its history, traditions, and modern contributions (Tkachenko et al., 2021). Cultural image remains ambiguous due to its complex historical narrative. In the past, Ukraine's cultural image was overshadowed by its historical ties to larger empires, such as the Russian Empire and the Soviet Union, leading to a limited global understanding of its distinct identity (Kravchenko, 2023; Vasylchuk & Drozdov, 2023). Ukraine was frequently perceived as a peripheral region rather than a sovereign cultural entity. Despite being constrained by imperial and later Soviet policies, Ukraine's cultural image endured in diaspora communities worldwide (Trzeczyńska et al., 2024). After 2014, Ukraine's cultural image underwent a significant transformation, marked by its resilience and determination to declare its identity during Russian full-fledged aggression (Ventura, 2024).

The Revolution of Dignity and the subsequent annexation of Crimea by Russia drew global attention to Ukraine's struggle for democracy (Tarnavska, 2019). The full-scale Russian invasion in 2022 solidified Ukraine's cultural image in the face of unprecedented adversity (Szczesń, 2024).

Research problem

This proves that the study of Ukraine's cultural image is essential in modern scientific discourse, as it provides valuable information about cultural diplomacy, geopolitical influence, and the dynamics of national identity in the context of a rapidly changing global landscape. Understanding how Ukraine's cultural image has evolved allows us to explore the intersections between culture, politics, and international relations. It also helps to challenge misrepresentations and stereotypes that have historically overshadowed

Ukraine's distinctiveness. As Ukraine continues to assert its sovereignty and strengthen its ties with other nations, the study of its cultural image serves as a vital tool in shaping international perceptions and fostering cross-cultural understanding, making it an essential area of research.

Research objectives

This research aims to show the importance of presenting Ukrainian culture in the international information environment to transform Ukraine's image positively. Accordingly, the study addresses three questions:

- 1) How can Ukraine use its cultural heritage and artistic expressions to strengthen its cultural image in the international information environment?
- 2) How is Ukrainian culture different from the unified Soviet identity and today's Russian culture regarding the recent geopolitical tensions and the ongoing war? How have prominent figures from Ukrainian heritage shaped national identity and cultural development?
- 3) What mechanisms can Ukraine implement to form a positive cultural image internationally?

Structure of the article

The article begins with an introduction outlining the significance of cross-cultural communication in shaping the cultural image of Ukraine globally. The literature review explores the theoretical frameworks of cultural diplomacy and international communication. The primary attention is paid to the recent investigations concerning the international information environment, cross-cultural communication, principles, and approaches to the formation of a positive image of a country. It then presents the research methodology, including participant selection and data collection techniques. The results and discussion section describes Ukraine's cultural heritage and artistic expressions to strengthen its cultural image in the international information environment. Also, the section explains the differences between Ukrainian culture, the unified Soviet identity, and today's Russian culture, particularly in the context of recent geopolitical tensions and the ongoing war. Additionally, the mechanisms to form a positive cultural image of Ukraine internationally were studied and discussed. Finally, the conclusion outlines the novel contributions of the study and their relevance to the field of research.

Literature Review

Cultural image is a topic of significant interest for researchers across various scientific fields, including sociology, political science, cultural studies, and communication (Obenza & Rabaca, 2024). Scholars examine how cultural images are constructed, maintained, and transformed through media, art, literature, and public diplomacy, exploring their impact on national identity and international perceptions (Galchynska et al., 2024). The study of cultural image also delves into issues of representation, stereotyping, and the role of soft power in shaping how cultures are viewed globally (Borysenko et al., 2024). Researchers investigate how historical events, social movements, and geopolitical dynamics contribute to forming a country's cultural image and how these images can evolve in response to shifting political or social contexts. With the rise of digital platforms and global interconnectedness, cultural image has become even more complex, making it a rich and ongoing area of scholarly inquiry (Owusu et al., 2023).

Many researchers study the cultural image of Ukraine to understand how its national identity has evolved, particularly in the context of historical, political, and social changes (Szerszeń, 2024; Tarnavska, 2019). Scholars explore how Ukraine's cultural image has been shaped by its struggles for sovereignty, its relationship with neighbouring countries, and its efforts to assert a distinct identity. Tkachenko et al. (2021) outlined the European view on the image of Ukraine. Andryczyk (2022) analysed cultural responses and reverberations after the war in the Donbas, and Olzacka (2023) investigated Ukrainian cultural policy in the context of Russian hybrid aggression. Tarnavska (2019) studied the media image of Ukraine in foreign newspapers. Dombrowski et al. (2022) explained the mechanisms of saving Ukrainian heritage. It is necessary to pay attention towards the works of Szerszeń (2024), who revealed the transformation of traumatic images of Ukraine through photography. This article analysed specific projects made in three chronological moments: the first half of the 1990s, after 2014, and now, in response to the ongoing war.

The interpretation of the notion of cultural diplomacy, its past and future, was described by Grincheva (2023). Hololobov (2022) investigated cultural diplomacy as a component of state policy. Ocón (2021) revealed the positive role of cultural diplomacy and analysed its contribution to reducing political tension.

Similarly, Antonova and Shevchenko (2023), studying Ukraine's cultural diplomacy, paid attention towards its place in consolidating the country's image within the global community. Filatova (2021) outlined the main approaches of Ukraine as a fully-fledged actor in the international arena. Also, scientists introduced progressive diplomacy methods widely applied by the modern Ukrainian state. It is worth mentioning the works of Tereshchuk (2019), who defined cultural diplomacy as a tool of Ukraine's foreign policy.

Notably, many researchers focus on the mechanisms of forming a positive cultural image, as this process is necessary for shaping public perception (Lee, 2023). They examine the various strategies countries or individuals employ to create and maintain a favourable image, emphasising the role of media, public diplomacy, and cultural exchanges. These mechanisms often include crafting narratives through storytelling highlighting positive aspects of culture, such as artistic achievements, historical milestones, or social progress, and leveraging international events to showcase a nation's strengths (Dobrolyubska et al., 2024). Researchers also explore the influence of soft power in image building, where countries use cultural exports, such as music, literature, and cinema, to project an appealing image to global audiences (Mashiah, 2024).

In addition to media and cultural exports, scholars investigate the role of political leadership, international alliances, and crisis management in shaping a positive image (Galchynska et al., 2024). They analyse how political figures and diplomatic efforts contribute to projecting a unified and attractive national identity, especially in conflict or instability. The impact of digital platforms and social media on image formation is another key area of research, as these tools allow for real-time, direct engagement with global audiences, enabling countries to counter negative perceptions and actively promote positive narratives (Owusu et al., 2023). Through these multifaceted approaches, researchers aim to understand how a positive cultural image is strategically built and maintained across different contexts and periods.

The topic of cross-cultural communications as an important aspect of the formation of the cultural image of Ukraine in the international information environment is especially relevant today, as Ukraine continues to navigate complex geopolitical challenges and asserts its national identity on the global stage (Ventura, 2024). In an era of rapid digital communication, where information spreads instantly across borders, the role of cross-cultural communication in shaping Ukraine's cultural image is getting even more critical. This is mainly explained by the conflict in the east of Ukraine since 2014 and the full-scale war in 2022. Its cultural narratives increasingly shape Ukraine's global reputation and international support.

Therefore, the literature review on the cultural image of Ukraine reveals specific conflicting perspectives regarding its portrayal in the international information environment. Some studies emphasise the rich cultural heritage of Ukraine and its potential for promoting a positive global image (Olzacka, 2023). Other perspectives criticise the challenges posed by several stereotypes, historical misconceptions, and geopolitical influences that distort the cultural identity of Ukraine (Kuzio, 2019). These debates often focus on the tension between the efforts of Ukraine to assert its distinct cultural narrative and the external pressures of misinformation campaigns. Some scholars diverge on strategies for addressing these issues through intensified state-led cultural diplomacy (Filatova, 2021), while others call for initiatives to reshape people's stereotyped perceptions (Lee, 2023). This diversity of viewpoints justifies a necessity to study the topic "Cross-cultural communications in shaping the cultural image of Ukraine in the international information environment".

Methodology

Research design

The theoretical framework for this cross-sectional survey study is developed using several interrelated approaches from communication, cultural studies, and international relations. Firstly, cultural diplomacy, as an extension of soft power, is a basis for this study, focusing on the ability of a nation to shape global outcomes through attraction rather than violence (Zguric et al., 2023; Nye, 2021). This approach emphasises culture's importance in forming Ukraine's international image, particularly during geopolitical tensions with Russia. Secondly, cross-cultural communication theory focuses on how communication varies across cultures and how misunderstandings occur when individuals from different cultural backgrounds interact (Drion, 2022; Li, 2023; Zhu, 2022). In the context of Ukraine, this theory examines how the cultural differences between Ukraine and other countries are understood in cross-cultural exchanges. Thirdly,

framing theory, as applied to mass media and communication studies, examines how media present or “frame” an issue, influencing how the public perceives it (Cheon et al., 2021). Regarding Ukraine, framing theory analyses how Ukrainian culture is represented in international media and how these representations build its global understanding. And fourthly, the theory of identity examines how nations construct their identities to the world (Damkier & Ozer, 2022; Wang & Hu, 2022). This theory explains the strategy for forming Ukraine’s cultural image from internal and external perspectives and how the international community interprets Ukrainian culture.

Samples and participants

The present cross-sectional survey study involved twenty-eight (28) participants who represented diplomatic service, journalism, art, and social media. The purposive sampling of participants considered their involvement in developing, disseminating, or interpreting Ukraine’s cultural image through cross-cultural communication. The participants included the employees of diplomatic departments who organised cultural events abroad (6); journalists who reported on Ukrainian culture or covered the ongoing geopolitical situation (7); international relations specialists who explored the problems of cultural diplomacy and geopolitical communication (3); Ukrainian cultural ambassadors and artists serving as representatives of Ukraine’s cultural image abroad (4); social media influencers and digital content creators who shape public opinion and cultural photos (8).

Instruments and procedures

A close-ended questionnaire was applied to evaluate the participants’ perceptions. It was structured in five blocks. Block 1 focused on how Ukraine can leverage its cultural heritage and artistic expressions to strengthen its cultural image internationally. Block 2 addressed how Ukrainian culture distinguishes itself from Soviet identity and contemporary Russian culture, particularly in the context of the war and political tensions. Block 3 referred to the influences of prominent historical and contemporary figures from Ukraine’s cultural heritage and their contribution to shaping its national identity and cultural development. Block 4 explored the potential mechanisms Ukraine can employ to form a positive cultural image internationally. Block 5 enabled us to assess the general international perception of Ukraine’s cultural image and its possible improvements. The questionnaire form was distributed through online survey platforms (Google Forms and SurveyMonkey) within professional networks, including diplomatic or cultural associations and targeted social groups related to cultural studies and international relations.

Data analysis

The data analysis required the implementation of qualitative and quantitative methods. Quantitative data from the closed-ended questionnaire was analysed using descriptive statistics. This included calculating the frequency of answers and standard deviations for questions related to perceptions of Ukraine’s cultural image, the influence of cultural heritage, and the meaning of cross-cultural communication. Qualitative data was analysed using document analysis (reports, articles, websites, official communications, and media) that provided contextual data and enabled us to understand the case deeply. This method helped to identify key themes related to how Ukrainian culture is perceived internationally, the differences between Ukrainian and Russian cultural identities, and suggestions for improving Ukraine’s cultural image through communication strategies. Besides, document analysis allowed for the deep exploration of participants’ views on the research questions.

Validity and reliability of the research instruments

To ensure the validity and reliability of the research instruments, the study employed a well-structured survey design developed based on existing theoretical frameworks in cross-cultural communication and cultural diplomacy. The close-ended questionnaire was pilot-tested with a small sample to prove their clarity, relevance, and correspondence with the research objectives. Its logical structure was measured using statistical methods to verify the scales’ reliability in assessing attitudes towards the cultural image of Ukraine.

Throughout the research process, ethical considerations were prioritised to ensure the study adhered to moral standards. Informed consent was obtained from all participants, who were informed about the purpose, scope, and confidentiality of the research. The study was conducted according to ethical

guidelines, which provided all the participants the option to withdraw at any stage without penalty. The research was transparent, which means that the findings were reported accurately and without bias.

Results and Discussion

The modern cultural image of Ukraine in the international information environment

The previous findings showed that the problem of strengthening the cultural image of Ukraine is an essential theme in scientific literature and related documents. The modern cultural image of a nation reflects its identity, values, and global relevance, shaped by its historical heritage, artistic achievements, and contemporary innovations (Tkachenko et al., 2021). Importantly, it was admitted that the cultural image of Ukraine is deeply intertwined with historical discourse, reflecting its rich heritage and complex past shaped by diverse influences (Kravchenko, 2023; Olzacka, 2023; Vasylchuk & Drozdov, 2023). Today, this image is predominantly influenced by the international information environment, where digital platforms, media narratives, and cultural exchanges play a pivotal role. The recent findings demonstrate that, for Ukraine, its modern cultural image is defined by resilience, creativity, and a deep-rooted heritage, all of which have been brought to global attention, particularly during times of crisis like the ongoing war (Szerszeń, 2024; Ventura, 2024).

At the same time, the questionnaire showed that the individuals participating in the study see Ukraine as innovative, determined, vibrant, independent, creative, patriotic, courageous and resilient (Figure 1). In the context of cultural image, Ukraine is characterised by its ability to withstand external pressures, particularly during the ongoing war. According to the participants, the bravery of the Ukrainian people, especially soldiers and civilians, is seen as a notable feature. Besides, a strong sense of national pride concerns Ukraine's culture. It was found that creativity, desire for independence, vibrancy, innovation, and determination are the foundation of Ukraine's modern image on the international stage today. These results prove that Ukraine has a multidimensional cultural image and specific approaches are needed to make it a positive phenomenon globally.

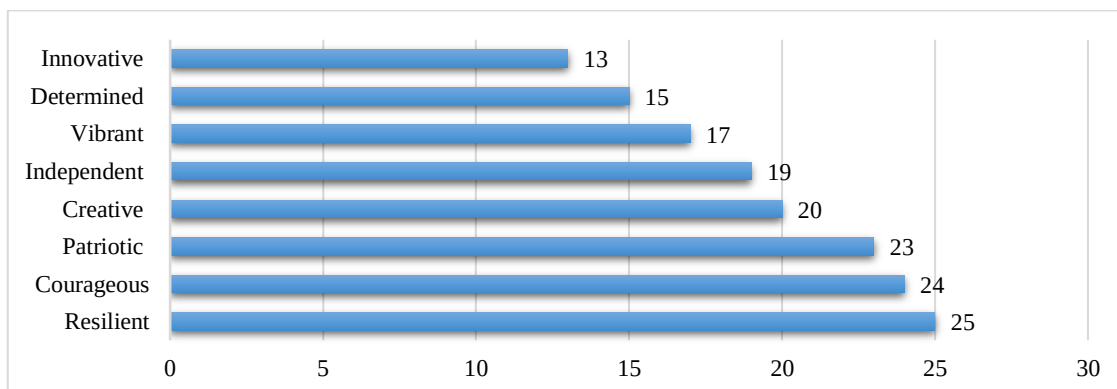


Figure 1. Description of the image of Ukraine.

Source: Author's development.

Studying cultural diplomacy, the literature review showed that it requires strategic planning, inclusivity, and adaptability to achieve meaningful engagement with international audiences (Hololobov, 2022). Cultural diplomacy activities usually correspond with a country's broader foreign policy and cultural identity, ensuring that all efforts are purposeful. The findings demonstrated that authenticity is essential; cultural diplomacy reflects a nation's heritage, values, and contemporary achievements to build trust and credibility (Filatova, 2021). Practical communication tools – digital platforms, traditional media, and public events – are used to reach diverse global audiences (Drion, 2022). Diversity plays a significant role since it requires the active participation of cultural leaders to represent the nation's richness (Grincheva, 2023). The participants were asked about the recent successful examples of Ukrainian cultural diplomacy: table 1 analyses Ukrainian cultural diplomacy events and their advantages for forming a positive image of Ukraine.

Table 1.
Examples of Ukrainian cultural diplomacy.

Campaign/Project	Number of participants	Advantages
The Ukrainian Institute	12	Promotes Ukrainian educational programs and cultural events.
Kyiv Biennial	11	Serves as a platform for Ukrainian artists.
Eurovision Song Contest	19	Showcases Ukrainian music and creativity; It symbolises Ukraine's ability to stand against external challenges (Jamala's "1944" in 2016 and Kalush Orchestra's "Stefania" in 2022).
Ukrainian Film Festival	15	Expresses Ukraine's national identity; Promotes the growth of the Ukrainian film industry.
"Ukraine NOW" campaign	16	Emphasises Ukraine's rich traditions; Rebrands the nation; Fosters a sense of national pride.

Source: Author's development.

The findings correspond with the outcomes from the existing scientific literature, which suggests that cultural diplomacy can promote Ukraine's identity and strengthen its international presence (Tereshchuk, 2019). However, the current context of ongoing war necessitates more innovative and practical approaches to maximise its impact (Klavdienko, 2024). The survey shows that traditional methods, such as exhibitions and cultural exchanges, remain valuable but must be complemented with modern strategies, including digital platforms, social media, and virtual reality, to reach global audiences effectively.

The formation of a positive cultural image of a country faces several potential challenges. According to Akaliyski and Welzel (2020), historical and geopolitical conflicts diminish cultural achievements. Braslauskas (2023) states that stereotypes create negative perceptions, making it challenging to present an authentic image. Economic limitations, regional disparities, and language and cultural differences also pose obstacles to the effective presentation of a country to global audiences (Xing & Jin, 2023). It was found that prevailing socio-cultural trends deeply influence the formation of a cultural image, as they shape public perceptions, social values, and how cultural identities are understood (Dobrolyubska et al., 2024). Socio-cultural trends such as globalisation, technological advancements, and shifting attitudes toward diversity directly impact how a nation's culture is perceived internationally. Misinformation and propaganda campaigns are widely used to manipulate public opinion and shape perceptions in the international information environment (Kravchenko, 2023). As a result, these undermine trust in the country's image. The current research outlines several challenges for forming Ukraine's positive image (Figure 2). It was found that most of the respondents mentioned geopolitical conflicts, stereotyping, and political instability. Other challenges include Soviet-era legacy and international media influence. Special attention was paid towards Russian propaganda that targets Ukraine's global reputation, spreading false narratives.

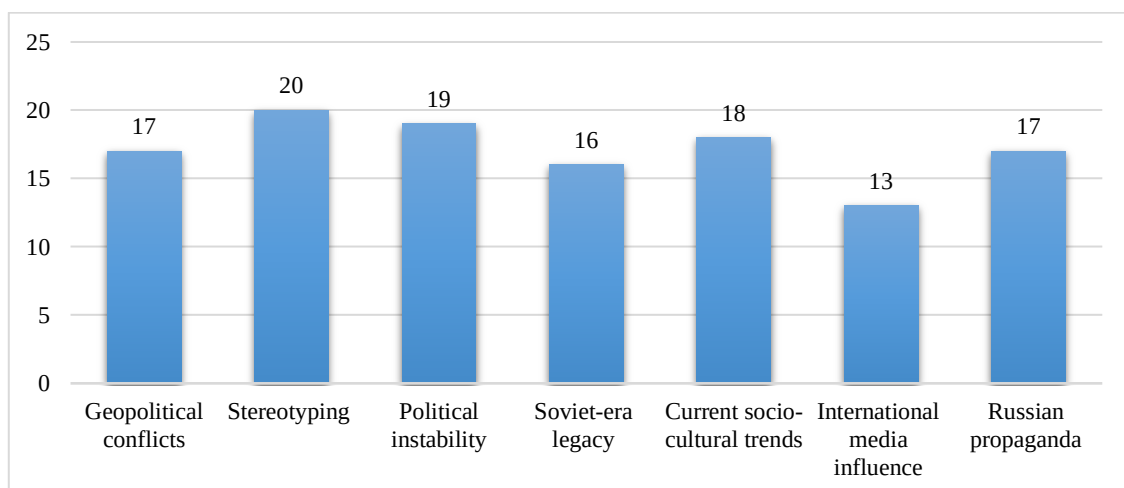


Figure 2. Challenges for the formation of Ukraine's positive image.

Source: Author's development.

The uniqueness of Ukrainian culture in the context of recent geopolitical tensions and the ongoing war

Ukrainian culture has a unique identity that has evolved through centuries of distinct historical, social, and political developments, setting it apart from the Soviet-era and modern Russian cultures (Botvyn et al., 2022). The findings insist that differentiating Ukrainian culture from external influences is essential for ensuring that Ukraine's heritage is accurately represented (Olzacka, 2023). The Soviet era left a lasting impact on many nations within its sphere of influence, often attempting to homogenise diverse cultural identities under a unified Soviet narrative (Zhurzhenko, 2021). However, Ukrainian culture has always retained its distinctive features despite these pressures. Similarly, modern Russian culture, shaped by its political realities, is distinct from Ukraine's cultural identity. Recognising this difference is vital in resisting external narratives that seek to combine the two cultures for ideological purposes (Grusheva, 2023). In the current context of geopolitical tensions, this differentiation is a matter of historical accuracy and a strategic imperative for Ukraine's cultural diplomacy.

Considering the recent findings studied during the literature review (Kravchenko, 2023; Ventura, 2024), it was found that distinguishing prominent Ukrainian figures from Russian and Soviet culture is essential for forming Ukraine's cultural image, especially in recent geopolitical tensions. Throughout history, many notable Ukrainian figures have been overshadowed by the larger narrative of Soviet and Russian influence, leading to a hidden identity. To study this aspect, the respondents were asked to describe the unique contributions of Ukrainian cultural personalities, whether in art or science. Table 2 shows these personalities and their contribution. During the study, cultural diplomacy experts and ambassadors admitted that spreading the facts about these prominent figures may help build a cultural image of Ukraine in the international information environment. These findings confirm the statements in the works of Antonova and Shevchenko (2023), who studied consolidating the country's image in the international arena. At the same time, the survey contributed to building the cultural image of Ukraine by revealing the historical facts about Ukrainian cultural personalities and their contribution.

Table 2.

Underestimated Ukrainian cultural personalities and their contribution

Personality	Number of participants	Contribution
Anna Yaroslavna (born approximately in 1032)	25	Cultural exchange and diplomacy; Education and religious influence.
Illia Repin (1844–1930)	12	Pioneering realist art; Masterful portraiture.
Ivan Pulyuy (1845–1918)	14	Pioneering work on X-ray technology; Study of electromagnetic waves.
Waldemar Haffkine (1860–1930)	11	Development of cholera and plague vaccines; Pioneering work in immunology.
Volodymyr Vernadskyi (1863–1945)	18	Founding the phenomena of the biosphere and noosphere; Biogeochemistry and geochemistry.
Mykola Leontovych (1877–1921)	23	Creation of “Shchedryk” (Carol of the Bells); Revival and arrangement of Ukrainian folk music; Development of choral music.
Kazymyr Malevich (1879–1935)	21	Founder of suprematism; Artwork “Black Square”.
Olha Ekster (1889–1950)	14	Development of abstract art; Integration of Ukrainian heritage and European modernism.
Oleksandr Arkhypenko (1887–1964)	9	Pioneer of modern sculpture.
Ihor Sikorskyi (1889–1972)	22	Pioneering helicopter development.
Serge Lifar (1905–1986)	19	Blending traditional classical choreography with avant-garde modernism; Promotion of male dancing.
Sofiia Yablonska (1907–1971)	15	Travel literature; Photography.

Source: Author's development.

Mechanisms for formation of Ukraine's positive cultural image internationally

The recent findings emphasise that a cultural image is constructed through distinctive symbols, narratives, and practices that reflect shared values and ideals. According to the theory of representation, cultural identity is produced and reshaped through unique symbolic systems such as art, language, and media (Rojas-Méndez & Davies, 2024). The analysis of recent scientific sources revealed that image formation involves deliberate efforts to highlight positive attributes while downplaying negative stereotypes or misconceptions (Braslauskas, 2023; Eriss & Khoshsaligheh, 2023). Besides, the mechanisms for forming a positive cultural image are based on branding and impression management theories, particularly concerning cultural diplomacy (Biletska, 2021). Scholars such as Vecchi et al. (2021) argue that national or cultural branding operates similarly to corporate branding. Accordingly, iconic representations and strategic storytelling are widely used to create an attractive image. The findings show that mechanisms such as international cultural exchanges, educational programs, and global media campaigns are strategically essential, and they are introduced to interpret a country's realities appropriately (Antonova & Shevchenko, 2023).

Notably, many academic works focus on using innovative technologies to form a positive image of a country (Bode, 2024; Konovalova, 2023). Technologies such as artificial intelligence, virtual reality, augmented reality, and social media enable nations to create immersive and engaging narratives that showcase their cultural heritage, achievements, and values (Bode, 2024; Jin, 2024). For instance, virtual and augmented reality tools create virtual tours of iconic landmarks or cultural festivals, providing international audiences with an authentic experience beyond geographical boundaries (Ouerghemmi et al., 2023). Besides, AI-driven content personalisation ensures targeted communication that resonates with diverse demographic groups, enhancing engagement (Suanpang & Pothipassa, 2024).

The study results showed that these mechanisms include cultural diplomacy supported by Ukrainian embassies and cultural institutions, film festivals, art exhibitions, campaigns to protect Ukraine's UNESCO sites, language promotion, tourism campaigns, participation in global events, and gastronomic diplomacy. The participants admitted that special attention must be paid towards Ukrainian literature translations, education exchanges, and historical education campaigns. It was mentioned that the Ukrainian diaspora plays a vital role in forming the country's positive cultural image. During the ongoing war, diaspora communities amplify Ukraine's cultural and historical narratives, highlight resilience, and increase international solidarity. At the same time, the study outcomes proved that elaborating and implementing strategies for the long-term development of cultural diplomacy in Ukraine is essential for strengthening the country's global presence, fostering international partnerships, and enhancing its cultural influence. The participants noted that long-term strategies enable Ukraine to build positive relationships with other nations, counter misinformation, and project a resilient national identity, especially amidst challenges like war and geopolitical instability. Figure 3 shows the participants' evaluation of the mechanisms of international formation of Ukraine's positive cultural image.

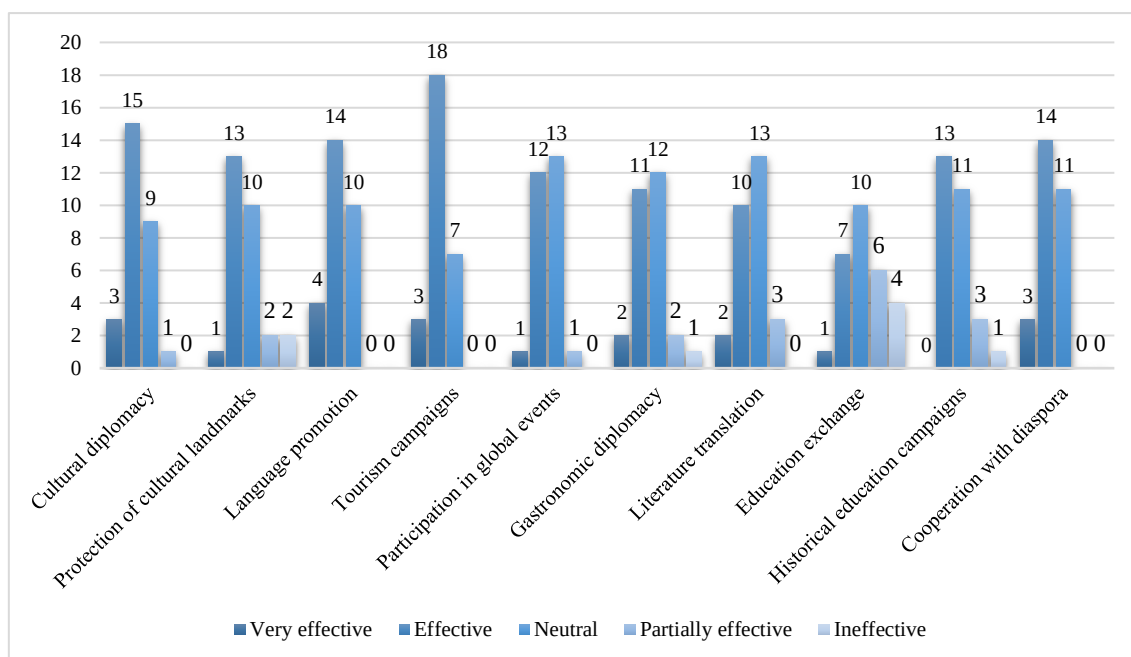


Figure 3. Evaluation of mechanisms of formation of Ukraine's positive cultural image internationally.
Source: Author's development.

The study of mechanisms of the formation of a positive cultural image of Ukraine internationally corresponds closely with the existing literature, which emphasises the importance of cultural diplomacy (Holobov, 2022), strategic communication (Filatova, 2021), improvement of cultural and historical narrative (Olzacka, 2023). However, while the literature broadly highlights short-term efforts to address immediate challenges (Lee, 2023), this study emphasises the need for a long-term perspective to ensure sustainable impact. Besides, the survey proved that applying a multifaceted approach that combines traditional methods with innovative measures can enhance the efficiency of cultural diplomacy and cross-cultural communication and maximise the ability of Ukraine to shape a positive cultural image that is clearly understood by the global audience.

Therefore, Ukraine can effectively convey its values and heritage by fostering cross-cultural dialogue. Ukraine can counter misinformation, highlight its resilience, and strengthen its soft power by implementing effective mechanisms for forming a positive cultural image. As the country navigates complex geopolitical challenges, cultural diplomacy is sufficient for building positive relationships and describing Ukraine's cultural identity on the world stage.

The study outcomes have essential implications for Ukraine's international engagement. They open opportunities for deeper collaboration with other nations, facilitate the global dissemination of accurate narratives about Ukraine, and combat stereotypes or misinformation. Integrating long-term cross-cultural strategies into diplomatic, educational, and media efforts can enhance Ukraine's soft power and attract tourism and investment. Moreover, effective cultural diplomacy during the ongoing war ensures that Ukraine's cultural contributions remain prominent in global discussions and shape a favourable reputation of the country.

Conclusions

The research proved that the modern cultural image of a nation reflects its identity, values, and global relevance, shaped by its historical heritage, artistic achievements, and contemporary innovations. Today, this image is influenced by the international information environment. In the context of cultural image, Ukraine is characterised by its ability to withstand external pressures, particularly during the ongoing war. The formation of a positive cultural image of a country faces several potential challenges that can hinder its effectiveness. In the Ukrainian context, the formation of Ukraine's positive cultural image is challenged by geopolitical conflicts, stereotyping, and political instability. Besides, Soviet-era legacy, international media influence, and Russian propaganda often target Ukraine's reputation, spreading false narratives.

The article demonstrated that it is essential to differentiate Ukrainian culture from external influences, particularly considering the Soviet-era discourse and modern Russian narrative. The research insists that this differentiation is a matter of historical accuracy and a strategic imperative for Ukraine's cultural diplomacy. The study showed that the formation of Ukraine's cultural image requires the creation of a pantheon of prominent Ukrainian figures. Special attention must be paid to personalities overshadowed by Soviet and Russian influence. It was admitted that spreading the facts about these notable figures may help build Ukraine's cultural image in the international information environment.

Image formation involves several efforts to highlight positive attributes and downplay negative stereotypes. The research developed effective mechanisms to form Ukraine's positive cultural image internationally. They include cultural diplomacy supported by Ukrainian embassies and cultural institutions, film festivals, art exhibitions, campaigns to protect Ukraine's UNESCO sites, language promotion, tourism campaigns, participation in global events, gastronomic diplomacy, Ukrainian literature translations, education exchanges, and historical education campaigns. Also, the authors emphasised that creating strategies for the long-term development of cultural diplomacy is essential for strengthening Ukraine's global presence and enhancing its cultural influence.

This study makes several novel contributions to cross-cultural communications and cultural diplomacy. Firstly, unlike the previous research that often focuses on general principles of cultural promotion, this study describes mechanisms for forming a positive cultural image of Ukraine to counteract stereotypes and misinformation during conflict. Secondly, the study emphasises the strategic use of digital platforms and long-term cultural diplomacy as primary instruments to enhance the global presence of Ukraine. And thirdly, the study introduces a cross-disciplinary perspective, combining the findings from communication theory, cultural studies, and international relations, to offer a comprehensive understanding of the issue being investigated.

Future research could investigate the role of digital media platforms in forming Ukraine's cultural narrative, particularly in the context of ongoing geopolitical challenges. It could also concentrate on the impact of cross-cultural communication strategies employed by Ukrainian diaspora communities in different countries and assess their effectiveness.

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War journalism in the digital age: The interaction between professionals and user-generated content

Військова журналістика в цифрову еру: Взаємодія між професійним користувацьким аудіовізуальним контентом

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Abstract

The research aims to study the attitudes of professional journalists to user-generated audiovisual content and to understand its role in war coverage. A cross-sectional study was used to answer the research questions using a mixed-methods approach. The approach incorporated a close-ended questionnaire and in-depth interviews with 12 professional journalists. The findings showed that user-generated audiovisual content is widely used in war journalism to complement news stories, fact-checking, publishing, research, and real-time reporting. Telegram and Facebook are extensively utilised to source user-generated audiovisual content. To verify user-generated audiovisual content, consulting with experts, cross-referencing official sources, geolocation, reverse image search, and implementation of visual verification platforms are used. Both benefits and challenges characterise user-generated audiovisual content. For example, these benefits include enhancement of the ability to cover stories in inaccessible areas, providing unique perspectives on events, more effective engagement with the audience, and seeding up the news. At the same time, the findings showed that most participants face difficulties verifying the authenticity of user-generated audiovisual content, particularly challenges in maintaining professional standards, technical problems, the necessity to verify the authenticity, and the use of sensitive content. The recommendations on integrating user-generated audiovisual content in war news reporting were developed to maximise the effect of user-generated audiovisual content. Some include using user-generated audiovisual content to report on war zones, avoiding user-generated content as the sole source, implementing legal standards for using user-generated content, avoiding misinterpretation,

Анотація

Мета дослідження – вивчити ставлення професійних журналістів до користувацького аудіовізуального контенту та зрозуміти його роль у висвітленні війни. Для досягнення мети дослідження було використано перехресне дослідження на основі змішаних методів. Цей підхід включав закрите опитування 12 журналістів, а також інтерв'ю для отримання додаткової інформації з теми дослідження. Результати дослідження продемонстрували, що користувацький аудіовізуальний контент широко використовується у військовій журналістиці як доповнення до новин, перевірки фактів, публікацій, досліджень і репортажів у реальному часі. Telegram і Facebook використовуються для пошуку користувацького аудіовізуального контенту. Для верифікації користувацького аудіовізуального контенту використовуються консультації з експертами, перехресні посилання на офіційні джерела, метод геолокації, зворотний пошук зображень, а також платформи візуальної перевірки відео та фотозображень. У військовій журналістиці користувацький аудіовізуальний контент має як переваги, так і недоліки. Наприклад, ці переваги включають покращення здатності висвітлювати події в недоступних районах, різні перспективи бачення подій, ефективніше залучення аудиторії, швидкість повідомлення новини. Водночас результати дослідження показали, що більшість учасників стикаються з труднощами у перевірці автентичності користувацького аудіовізуального контенту, зокрема це дотримання професійних стандартів, технічні труднощі, необхідність перевірки автентичності та використання чутливого контенту. Щоб максимізувати ефект від використання користувацького аудіовізуального

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introducing fact-checking tools, and assessing source credibility. The outcomes can be implied in journalism, media studies, and conflict reporting.

Keywords: Audiovisual communication, media interaction, digital content, journalist strategies, media analytics.

контенту було розроблено рекомендації щодо інтеграції такого контенту під час створення воєнних репортажів. Ці рекомендації включають: використання користувацького аудіовізуального контенту для репортажів із зони бойових дій; уникнення користувацького аудіовізуального контенту як єдиного джерела інформації; впровадження юридичних стандартів використання користувацького аудіовізуального контенту, створеного користувачами; уникнення неправильного тлумачення інформації; впровадження інструментів фактчекінгу; оцінка достовірності джерела. Результати можуть бути використані в журналістиці, дослідженнях, що стосуються засобів масової інформації, та під час висвітлення збройних конфліктів.

Ключові слова: Аудіовізуальна комунікація, медіа-взаємодія, цифровий контент, журналістські стратегії, медійна аналітика.

Introduction

Context

In the last two decades, journalism has been marked by transformative changes in producing, accessing, and distributing audiovisual information, primarily driven by the proliferation of digital platforms and social media (Fernández-Castrillo & Ramos, 2023). The rise of smartphones and affordable recording technologies has democratised content creation, allowing professionals and citizens to capture and share real-time audiovisual communication. As primary distribution channels, social media platforms enable rapid news dissemination, often bypassing traditional media (Kitsios et al., 2022). This shift has led to a decentralised media landscape in which audiovisual content is dominant in engaging audiences. The second generation of web tools, such as social media, blogs, and video-sharing platforms, empower users to participate actively but not consume the information passively (Peña-Fernández et al., 2024). Web 2.0 changed audiences from passive recipients into active contributors, enabling them to comment on articles, share news, and create content (Masip et al., 2019). This participatory culture has led to the rise of user-generated content (UGC) (Cervi, 2019; Peña-Fernández et al., 2024).

Professional journalism and UGC differ significantly in standards, credibility, and purpose, yet both play vital roles in contemporary media (Zhu et al., 2023). Professional journalism is characterised by adherence to ethical guidelines, rigorous fact-checking, and structured storytelling crafted by trained reporters within established institutions (Truyens & Picone, 2021). It aims to provide accurate, balanced, and contextually rich information to the public. In contrast, UGC prioritises immediacy and personal perspectives, offering raw, unfiltered glimpses into events (Gruszynski Sanseverino & De Lima Santos, 2021). Kerkhof and Münster (2019) indicate that UGC is becoming more critical for today's media market. The scholars emphasise that it is widely used to enhance engagement, provide diverse perspectives, and offer real-time information (Kitsios et al., 2022). Some findings demonstrate that UGC helps build trust and authenticity since it showcases real customers endorsing products or services (Basile et al., 2024).

Research Problem

The recent findings show that UGC spreads rapidly during war, and it contributes to documenting events, providing real-time updates, and amplifying voices from affected regions (Fernández-Castrillo & Ramos, 2023). Often, UGC highlights stories that might be overlooked by mainstream media, shedding light on human suffering and resistance efforts (Zasiekin et al., 2022). In news reporting, UGC is a source of raw, on-the-ground content, such as videos, images, and firsthand accounts shared by individuals witnessing events (Breve et al., 2024). This material is particularly valuable during breaking news or conflict zones where professional reporters face limited access. However, the lack of verification in UGC poses risks of misinformation, requiring professional journalists to verify such material (Stewart, 2021).

The topic of the interplay between professional war journalism and user-generated audiovisual content (UGAVC) is critical in the context of the Russian-Ukrainian war as it explores the evolving dynamics of how news and information about the conflict are produced and shared. This research helps to understand how these sources of information interact, complement, or sometimes conflict with each other and how they form public perception of the war. Additionally, this research highlights the changing landscape of war reporting, where the line between professional journalism and digital content becomes increasingly thin.

Objectives

Accordingly, the research aims to study professional journalists' attitudes to UGAVC and understand its role in war coverage. The research addresses three questions. They are the following:

- 1) Do professional war journalists use UGAVC? How do they interact with it?
- 2) What are the benefits and challenges of UGAVC? Does this content affect professional standards and ethics?
- 3) How does UGAVC affect audiences?
- 4) What are the requirements for integrating UGAVC in war news reporting?

Structure of the article

The research article explores the evolving dynamics of war reporting in the context of digital advancements. The introduction sets the topicality of the research problem by discussing the significance of war journalism and the emergence of UGAVC in the digital era, followed by a literature review that examines previous research on professional journalism practices and the influence of UGAVC. The methodology section presumably outlines the research design based on a cross-sectional survey to analyse the interaction between professionals and UGAVC. The results and discussion section presents key findings, such as the benefits and challenges of integrating UGC into war reporting, highlighting aspects like authenticity verification and ethical concerns. Finally, the article concludes by summarising the implications for journalism practices in the digital age and suggesting directions for future research.

Literature Review

UGC has become a widely studied phenomenon due to its profound impact on communication, media, and society (Kubin et al., 2024; Liaropoulos, 2023). The scientific sources demonstrated how UGC reshapes information ecosystems (dos Santos, 2022). In journalism, UGC is analysed to supplement traditional reporting, especially during crises (Cervi, 2019). Researchers examine its benefits and challenges, including misinformation, bias, and ethical implications of using unverified content (Kerkhof & Münster, 2019; Sang et al., 2024). The influence of UGC in marketing is another key focus. For example, several findings insist on the role of UGC in customer experience management (Gârdan et al., 2022; Sykora et al., 2022). Basile et al. (2024) explain the contribution of UGC to brand value co-creation. Also, Kitsios et al. (2022) present the employment of UGC in hospitality. Furthermore, some studies investigate UGC's role in facilitating collaborative learning in education (Okwilagwe & Jinadu, 2023). It is worth mentioning that information literacy is essential when people encounter UGC. In this context, some sources concern the formation of information literacy and skills of navigation of the complexities of UGC (Bhinder, 2020; Yeh & Swinehart, 2020). The recent findings show the role of UGC political activism and driving collective action in social movements (Aal et al., 2024; Yamamoto et al., 2022).

Recent studies prove that UGC is examined in different contexts during emergencies. Primarily, researchers investigate the use of digital content in covering war events (Liaropoulos, 2023; Maathuis & Kerkhof, 2023). Yadav et al. (2024) insist that digital content played a significant role in polarising views on the Russia-Ukraine conflict. Some findings concern the ability of UGC to complement professional war journalism (Cervi, 2019). Gruszynski Sanseverino and De Lima Santos (2021) focus on integrating UGC into journalistic practices to present relevant information during a crisis. Some findings show the use of UGC in online newspapers to cover the Russia-Ukraine war (Fernández-Castrillo & Ramos, 2023). Besides, UGC is an instrument for countering terrorism by identifying threats and disseminating content that counters terrorist propaganda (Binder & Kenyon, 2022; Popovic & Kozar, 2023). The social impact of UGC is extensively discussed in the works of dos Santos (2022).

Academic inquiries also address the challenges of UGC (Kitsios et al., 2022; Shahbazi & Bunker, 2024) and understanding its emotional and psychological influence on audiences (Sang et al., 2024). Zasiakin et al. (2022) describe the psychological characteristics of UGC. Additionally, UGC often employs audiovisual communication that resonates deeply with audiences, enhancing its ability to influence opinions, attitudes, and behaviours (Fernández-Castrillo & Ramos, 2023; Leszczuk et al., 2023). However, some findings say UGC can also bring adverse psychological effects, such as anxiety, misinformation, or desensitisation, particularly during crises like wars or natural disasters (Kušen & Strembeck, 2023). According to Borges-Tiago et al. (2019), a person who generates audiovisual content is often fueled by profound motivation rooted in personal, moral, or societal imperatives.

Despite several challenges of UGC, scientific sources describe some successful cases when social media posts and videos documented conflicts, bringing international attention to war crimes and influencing aid efforts. For example, Meral and Meral (2021) explain the importance of digital content in the “Arab Spring” movement. Social media are also used to discuss the Syrian uprising, the civil war, and immigration (Miconi, 2020) or to protest the restrictions on women’s rights in Iran (Ahmadi et al., 2023). Hamas Elmasry (2024) focused on using UGC to cover the initial phase of the fifth Israel-Gaza war by popular news channels. A case study from the Russia-Ukraine war was described in the context of the formation of public opinion through UGC (Babenko et al., 2024; Geissler et al., 2023). Besides, some works refer to countering propaganda about the Russia-Ukraine war on social media (Hasan, 2024) and the significant emotional effect of UGC on audiences (Maathuis & Kerkhof, 2023).

The article addresses some controversies and debates surrounding the integration of UGC into professional war reporting. One central discussion deals with the tension between democratising news production and eroding journalistic standards. Some scholars argue that UGC enriches war journalism by providing diverse perspectives, real-time updates, and coverage from conflict zones (Berg et al., 2024; Maschmeyer et al., 2023). However, critics have concerns over the reliability and authenticity of UGC, emphasising the challenges it poses to maintaining ethical and professional standards in journalism (Basile et al., 2024; Sang et al., 2024). Another issue is the power dynamic between traditional journalists and citizen reporters, with some suggesting that UGC undermines the authority of professionals (Nah et al., 2024), while others see it as a collaborative opportunity (Kubin et al., 2024). Additionally, debates touch upon the use of sensitive content (Shahbaznezhad et al., 2021; Zasiakin et al., 2022). When these perspectives are examined, the research reveals the complexities of war journalism in the digital age and the need for responsible integration of UGAVC.

Therefore, investigating the use of UGAVC during war and its media interplay with professional war journalism is essential for understanding the dynamics of war reporting and its impact on public perception. As traditional media face increasing limitations in conflict zones, UGAVC has become necessary for documenting real-time events. This content, shared by individuals directly involved or affected by the conflict, offers valuable information about human experiences and war realities. Examining how this content interacts with professional journalism allows for a deeper understanding of media influence, the role of citizen journalism, media analytics, and the ethical challenges in war reporting. The interplay between UGAVC and professional journalism may help shape the understanding of conflicts globally, influencing political discourse.

Methodology

Research Design

The attitudes of professional journalists to UGAVC and the evaluation of its role in war coverage were carried out based on a cross-sectional survey study equipped with a mixed-methods approach. The approach incorporated a close-ended questionnaire among journalists and in-depth interviews to gain deeper information into the motivations, decision-making processes, and ethical considerations of UGAVC. This cross-sectional design allowed researchers to assess the current interplay between professional journalism and UGAVC during a specific conflict, such as the Russian-Ukrainian war. During the investigation of theoretical analysis based on gatekeeping (Salonen et al., 2022), agenda-setting (Geiß, 2022), and framing theories (Lindgren et al., 2024), combined with empirical data resulted in a comprehensive understanding of how professional war journalism and UGAVC coexist.

Informants

The cross-sectional study involved 12 journalists representing diverse media platforms – television, radio, print, online journalism, and hybrid media. The selection of informants considered the following criteria: (1) professional background (war reporting experience, journalism experience, inclusion in journalistic role); (2) media platform representation; (3) geographical relevance to Ukraine; (3) experience with media interaction with UGAVC; (5) awareness of journalism standards; (6) diversity in demographics (age, gender, nationality); (7) availability and willingness to participate. Table 1 shows the characteristics of informants.

Table 1.
Characteristics of informants

Characteristics		Number
Age	Less than 30 years	1
	31-35 years	4
	35-45 years	4
	45-50 years	2
	Over 50 years	3
Gender	Male	8
	Female	4
Nationality	Ukrainian	9
	Other	3
War reporting experience	Yes	12
	No	0
Journalism experience	Over 10 years	12
	Less than	0
Role	Reporter	7
	Editor	3
	Multimedia producers	2
Media platform	Television	5
	Radio	1
	Print	2
	Online journalism	2
	Hybrid media	2
Geography	Located in conflict zone	2
	Travel to conflict zone	10
Media interaction with UGAVC	Always	1
	Often	4
	Sometimes	5
	Rarely	2
	Never	0
Possession of verification practices	Yes	12
	No	0
Adherence to ethical journalism	Yes	12
	No	0
Availability and willingness to participate	Yes	12
	No	0

Source: Author's development.

The justification for the sample size and participant selection strategy stems from the need to comprehensively understand the interplay between professional journalists and UGAVC in war reporting. The sample size was calculated according to the study's qualitative or quantitative nature. The selection strategy prioritised participants actively engaged in war reporting or managing UGAVC in professional contexts. Besides, the sample size was statistically calculated to ensure representativeness and reliability.

Instruments and Procedures

The cross-sectional study questionnaire was an integral instrument for collecting standardised data from professional journalists on their experiences with UGAVC. It explored themes such as the frequency and context of its usage, verification practices, ethical challenges, impact on audience engagement, and media analytics. Distributed electronically through email and professional networks, the questionnaire ensured a broad reach and accessibility, particularly for journalists actively engaged in war reporting. The questionnaire validation process involved several critical steps to ensure its reliability and validity. Firstly, the researchers designed the questionnaire based on a thorough review of existing literature and theoretical

frameworks related to war journalism and UGAVC. Secondly, the draft questionnaire was reviewed by a panel of experts in journalism, media studies, and digital communication to ensure the questions' relevance, clarity, and comprehensiveness. Thirdly, pilot testing was conducted with a small, representative sample of participants. It helped to identify the possible difficulties in understanding the questions. Table 2 presents the questionnaire used during the cross-sectional study.

Table 2.
Cross-sectional study questionnaire

I. Media interaction with UGAVC				
1) How often do you interact with UGAVC?				
a) Daily	b) Weekly	c) Monthly	d) Rarely	e) Never
2) At what stage of your reporting process do you interact with UGAVC?				
a) Research	b) Complementing	c) Publishing	d) Fact-checking	e) Real-time reporting
3) What is your primary platform for sourcing UGAVC?				
a) Twitter	b) Facebook	c) Instagram	d) TikTok	e) Telegram
4) What type of UGAVC do you interact with most frequently?				
a) Video Footage	b) Photographs	c) Text-based posts	d) Infographics	e) Audio reports
5) Do you verify UGAVC?				
a) Yes		b) No		
6) What journalist strategies do you most frequently use for verifying UGAVC?				
a) Reverse image search	b) Geolocation tools	c) Cross-referencing with official sources	d) Visual verification platforms	e) Consulting experts
II. Benefits and challenges of UGAVC				
7) Does UGAVC enhance your ability to cover stories in inaccessible areas?				
a) Yes		b) No		
8) Do you believe UGAVC provides unique perspectives compared to traditional sources?				
a) Strongly agree	b) Agree	c) Neutral	d) Disagree	e) Strongly disagree
9) Does UGAVC help you to engage audiences more effectively?				
a) Yes		b) No		
10) Do you think UGAVC speeds up the news reporting process?				
a) Strongly agree	b) Agree	c) Neutral	d) Disagree	e) Strongly disagree
11) Does UGAVC improve the diversity of voices in your reporting?				
a) Strongly agree	b) Agree	c) Neutral	d) Disagree	e) Strongly disagree
12) Do you face issues regarding the copyright or permission to use UGAVC?				
a) Yes		b) No		
13) Are there concerns about the ethical implications of using UGAVC?				
a) Always	b) Often	c) Sometimes	d) Rarely	e) Never
14) Do you find that UGAVC contains sensitive content that is challenging to publish responsibly?				
a) Yes		b) No		
15) Do you encounter challenges in verifying the authenticity of UGAVC?				
a) Always	b) Often	c) Sometimes	d) Rarely	e) Never
16) Do you face technical difficulties in editing UGAVC for publication?				
a) Yes		b) No		
17) Does using UGAVC create challenges in maintaining professional standards?				
a) Always	b) Often	c) Sometimes	d) Rarely	e) Never
III. Impact of UGAVC on audiences				
18) Has UGAVC had a more substantial emotional impact on audiences than professional journalism?				
a) Strongly agree	b) Agree	c) Neutral	d) Disagree	e) Strongly disagree
19) Does UGAVC contribute to audience anxiety or stress during war coverage?				
a) Yes		b) No		
20) Does UGAVC foster a sense of urgency in audience reactions to war-related events?				
a) Strongly agree	b) Agree	c) Neutral	d) Disagree	e) Strongly disagree
21) Do you think audiences trust UGAVC more than professional journalism?				
a) Strongly agree	b) Agree	c) Neutral	d) Disagree	e) Strongly disagree
22) Does UGAVC motivate audiences to take action?				
a) Always	b) Often	c) Sometimes	d) Rarely	e) Never
23) Do you think UGAVC influences audience opinions about war-related events?				
a) Strongly agree	b) Agree	c) Neutral	d) Disagree	e) Strongly disagree
24) Does UGAVC contribute to the spread of misinformation?				
a) Strongly agree	b) Agree	c) Neutral	d) Disagree	e) Strongly disagree
IV. Integration of UGAVC in war news reporting				
25. For which type of stories do you use UGAVC?				
Breaking news	Personal stories	Investigation	Commentary	Other
26) Do you use UGAVC to provide visual evidence for your reports?				
a) Yes		b) No		

27) How often is UGAVC's sole source of audiovisual communication for a war-related story?				
a) Always	b) Often	c) Sometimes	d) Rarely	e) Never
28) Are ethical guidelines for using UGAVC in war reporting well-established in your organisation?				
a) Strongly agree	b) Agree	c) Neutral	d) Disagree	e) Strongly disagree
29) Have you ever decided against using UGAVC due to ethical concerns?				
a) Yes		b) No		
30) Does UGAVC help report on inaccessible war zones?				
a) Strongly agree	b) Agree	c) Neutral	d) Disagree	e) Strongly disagree

Source: Author's development.

In-depth interviews were employed as a complementary method to enhance the study's depth, focusing on integrating UGAVC into war reporting. These interviews provided a platform for journalists to discuss their personal experiences, share detailed accounts of specific challenges, and highlight innovative strategies for verifying UGAVC and ethical considerations for its usage. The questionnaire and interviews offered a comprehensive methodological framework to analyse the dynamic interplay between professional war journalism and UGAVC.

Data Analysis

A mixed-methods approach was employed for data analysis to provide quantitative and qualitative outcomes. The quantitative data from the close-ended questionnaire was analysed as Likert-scale responses using statistical instruments such as descriptive statistics and frequency analysis to identify trends and patterns in integrating UGAVC by professional journalists. These findings quantified the frequency of usage of UGAVC, the challenges faced, and its impact on audiences. For the survey, the data was analysed using SPSS software. The qualitative data from in-depth interviews was analysed using thematic analysis, allowing for developing recommendations on integrating UGAVC into war news reporting. The thematic analysis involved manual methods and qualitative data analysis software like NVivo to systematically organise and analyse textual data.

Ethical Considerations

Participants were provided with detailed information about the study's purpose, procedures, potential risks, and benefits, presented in a clear format as a written consent form. They were also informed of their right to withdraw from the study at any time. To ensure the confidentiality of participant data, personal identifiers were anonymised during data collection and analysis.

Results and Discussion

Using UGAVC by professional war journalists

The literature review demonstrated that using UGAVC by professional war journalists became increasingly prevalent (Hamás Elmasry, 2024). The findings showed that journalists incorporate UGAVC into their war news reports to supplement their coverage (Fernández-Castrillo & Ramos, 2023). However, scholars insist that integration requires careful verification and ethical considerations to ensure the authenticity of the content and avoid spreading misinformation (Stewart, 2021). Besides, it was found that journalists often use UGAVC to provide a more emotional connection for audiences (Sykora et al., 2022). At the same time, the cross-sectional study proved that professional war journalists use UGAVC in their news reporting. Most use this content weekly and monthly (4 individuals each). Studying the interaction with UGAVC, it was found that 33,3 % use it to complement news stories and fact-checking. Besides, some journalists need UGAVC for publishing (17%) and research (8,4%). 25 % of participants stated that they interact with UGAVC during real-time reporting. Figure 1 shows the interaction with UGAVC.

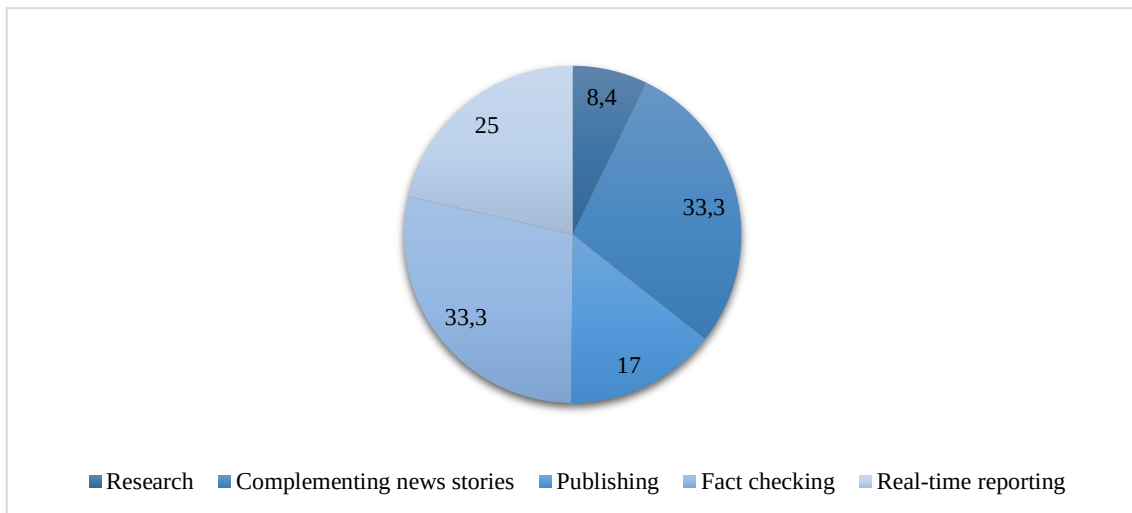


Figure 1. Interaction with UGAVC.

Source: Author's development.

The cross-sectional study also focused on using platforms to source UGAVC. The findings showed that most participants (4) use Telegram and Facebook to source UGAVC. Other platforms include Twitter, Instagram, and TikTok. Figure 2 presents the preferences of professional war journalists related to platforms for sourcing UGAVC.

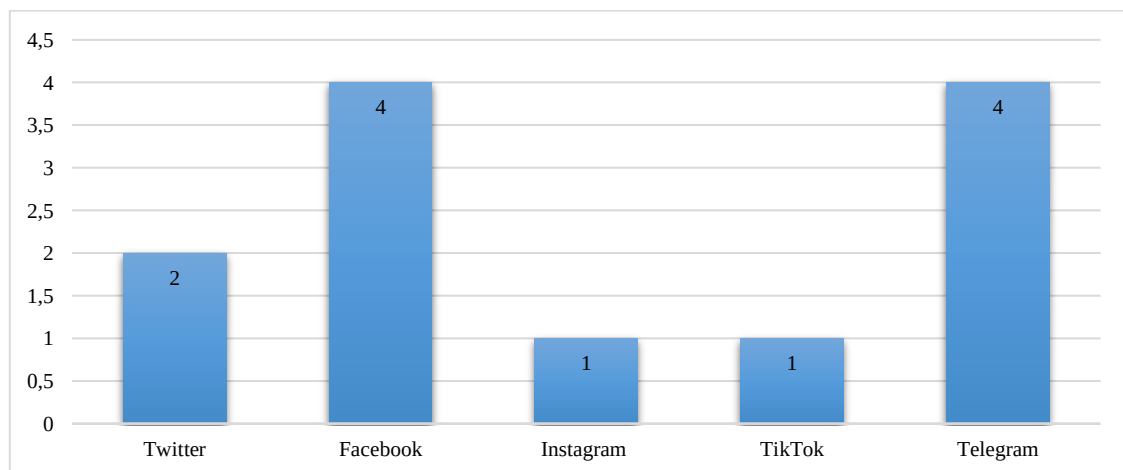


Figure 2. Platforms for sourcing UGAVC.

Source: Author's development.

The results prove that most journalists verify the content, but there were few examples of journalists using UGAVC in real-time reporting without verification. It was found that most participants consulted with colleagues and experts before broadcasting UGAVC (4 individuals). Other journalist strategies include cross-referencing with official sources, geolocation, Reverse image search, and visual verification platforms. Figure 3 shows the selection of journalist strategies for verifying UGAVC by professional war journalists.

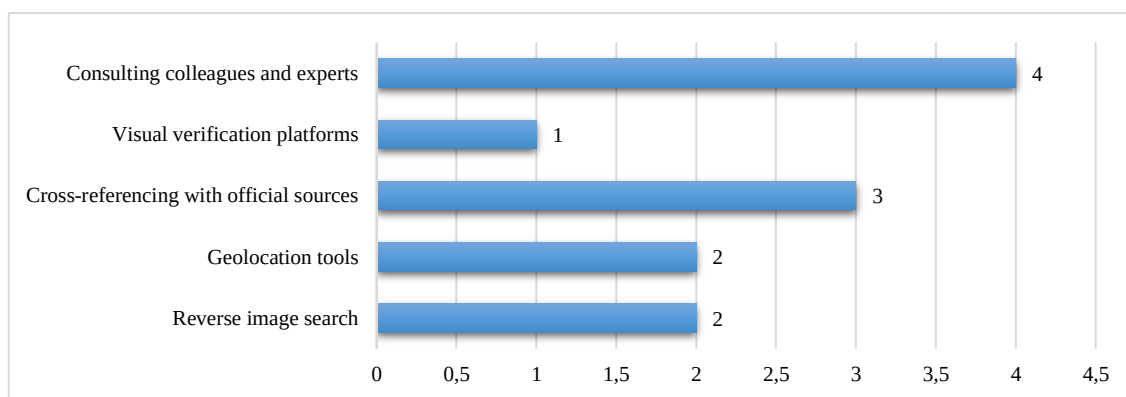


Figure 3. Verifying UGAVC.
Source: Author's development.

Further, it is necessary to explain the benefits and challenges of UGAVC to understand its impact on modern journalism, particularly in enhancing real-time reporting and audience engagement.

Benefits and challenges of UGAVC

The scientific sources revealed that UGAVC offers significant benefits and poses notable challenges in war reporting (Maschmeyer et al., 2023; Yadav et al., 2024). Among its advantages, UGAVC provides real-time comments from individuals directly affected by events, often filling gaps where professional journalists cannot be present due to safety concerns. Additionally, UGAVC allows for diverse viewpoints, democratising information dissemination. However, the challenges of using UGAVC include difficulties verifying content authenticity and accuracy (Kerkhof & Münster, 2019). Zhu, Lang, and Dietl (2023) admit that ethical considerations also arise. The cross-sectional study showed that professional war journalists face several benefits and challenges while integrating UGAVC into news reporting. Some benefits include enhancement of the ability to cover stories in inaccessible areas and providing unique perspectives on events compared to traditional sources. The benefits of UGAVC according to the study participants are given in Figure 4.

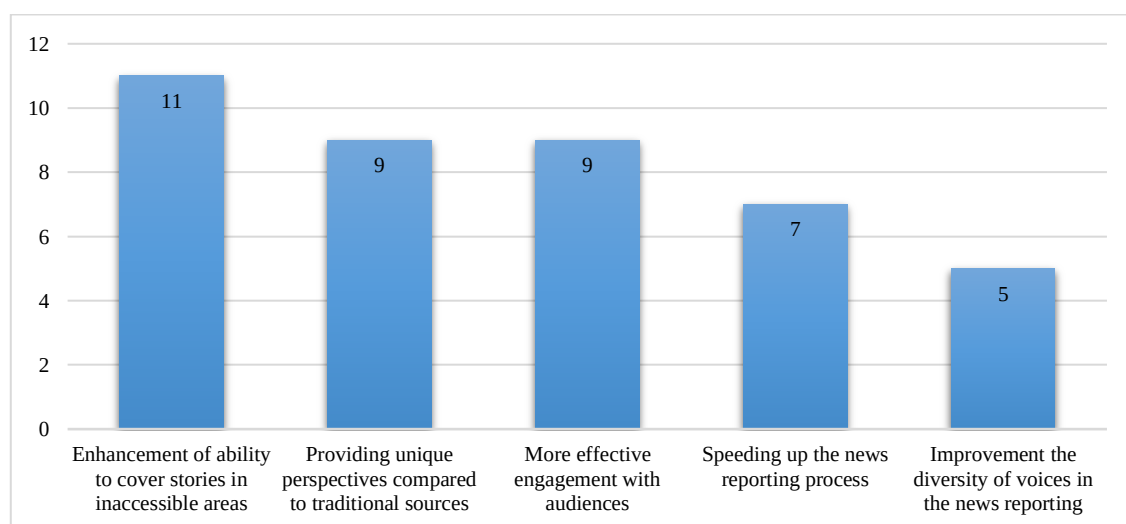


Figure 4. Benefits of UGAVC.
Source: Author's development.

At the same time, scientific efforts were oriented towards analysing the challenges of UGAVC. The findings showed that most participants face difficulties verifying the authenticity of UGAVC. Also, many professional war journalists admitted that UGAVC contains sensitive content, and it is essential to publish it responsibly. The challenges of UGAVC revealed during the cross-sectional study are shown in Figure 5.

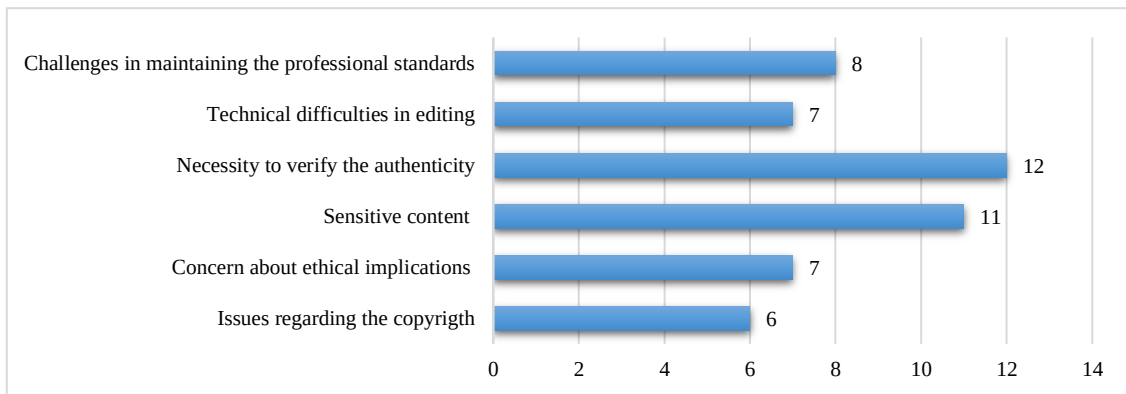


Figure 5. Challenges of UGAVC.

Source: Author's development.

Then, the impact of UGAVC on audiences was studied since it is essential to understanding how it shapes public opinion, influences emotional responses, and affects trust in media during war.

Impact of UGAVC on Audiences

During the literature review, special attention was paid to the impact of UGAVC on audiences by shaping their perceptions, emotional responses, and understanding of events, particularly during wars (Zasiekin et al., 2022). The findings showed that the impact is not always positive (Marukhovska-Kartunova et al., 2023). At the same time, unverified or biased UGAVC spreads misinformation, polarises opinions, and erodes trust in media if not contextualised by professional journalism (Kerkhof & Münster, 2019). Additionally, the problem of authenticity of UGAVC was widely discussed in the scientific literature (Basile et al., 2024; Kerkhof & Münster, 2019).

At the same time, the cross-sectional study revealed that the use of UGAVC in war news reporting by professional journalists causes stronger emotions, anxiety, and stress. It also fosters a sense of urgency, influences audience opinions, and motivates them to take action. Moreover, it was found that in some cases, UGAVC helps build trust in news reports despite its ability to spread misinformation. Figure 6 summarises the impact of UGAVC on audiences.

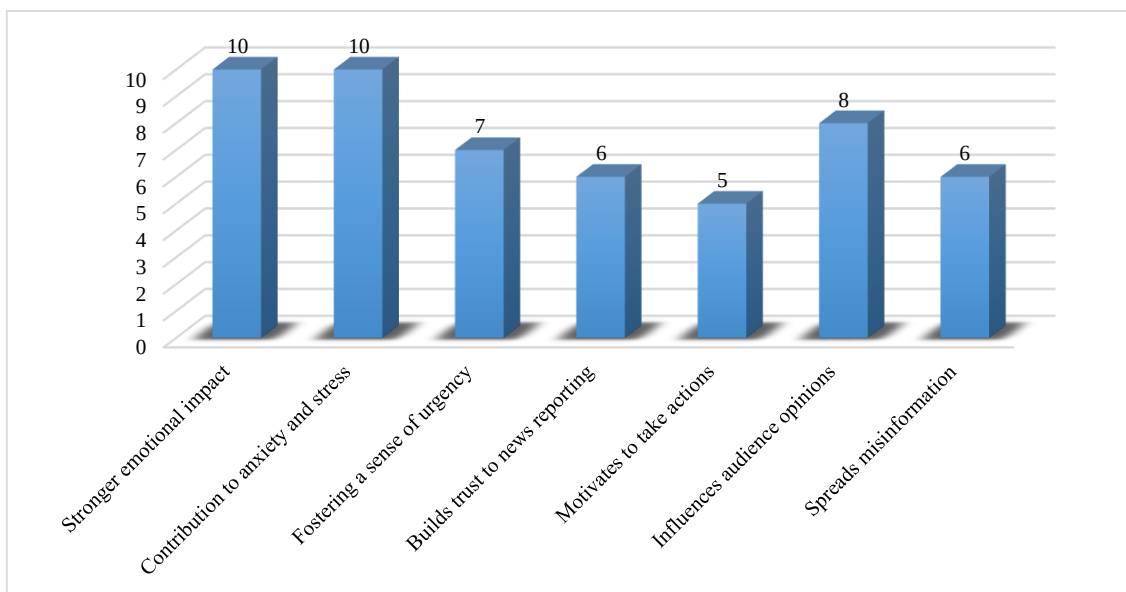


Figure 6. Impact of UGAVC on audiences.

Source: Author's development.

Further, the findings showed that to maximise the benefits of UGAVC in war news reporting, it is essential to integrate it properly through thorough verification, ethical contextualisation, and alignment with professional journalistic standards.

Integration of UGAVC in war news reporting

Analysing scientific sources proves that properly integrating UGAVC into war news reporting is essential for ensuring accurate and impactful journalism (Zecchinon & Standaert, 2024). The findings showed that, when verified, UGAVC enhances storytelling, adds depth and authenticity to war coverage, and fosters greater audience engagement (Peña-Fernández et al., 2024; Selvarajah & Fiorito, 2023). However, improper use of UGAVC leads to the spread of misinformation, sensationalism, and audience mistrust (Hasan, 2024; Shahbazi & Bunker, 2024).

The cross-sectional study enabled the development of recommendations on the integration of UGAVC in war news reporting. Journalists admitted in in-depth interviews that these recommendations are crucial in Ukraine today, considering the ongoing conflict and the vital role of accurate information in shaping both domestic and international perceptions. The well-defined guidelines ensure that such content is verified, ethically used, and contextualised to prevent misinformation and propaganda. The recommendations are also essential for protecting the rights and privacy of content creators. When information is a necessary tool during war, straightforward strategies for integrating UGAVC responsibly strengthen the integrity and effectiveness of Ukraine's war reporting. Figure 6 presents the analysis of recommendations for integrating UGAVC in war news reporting.

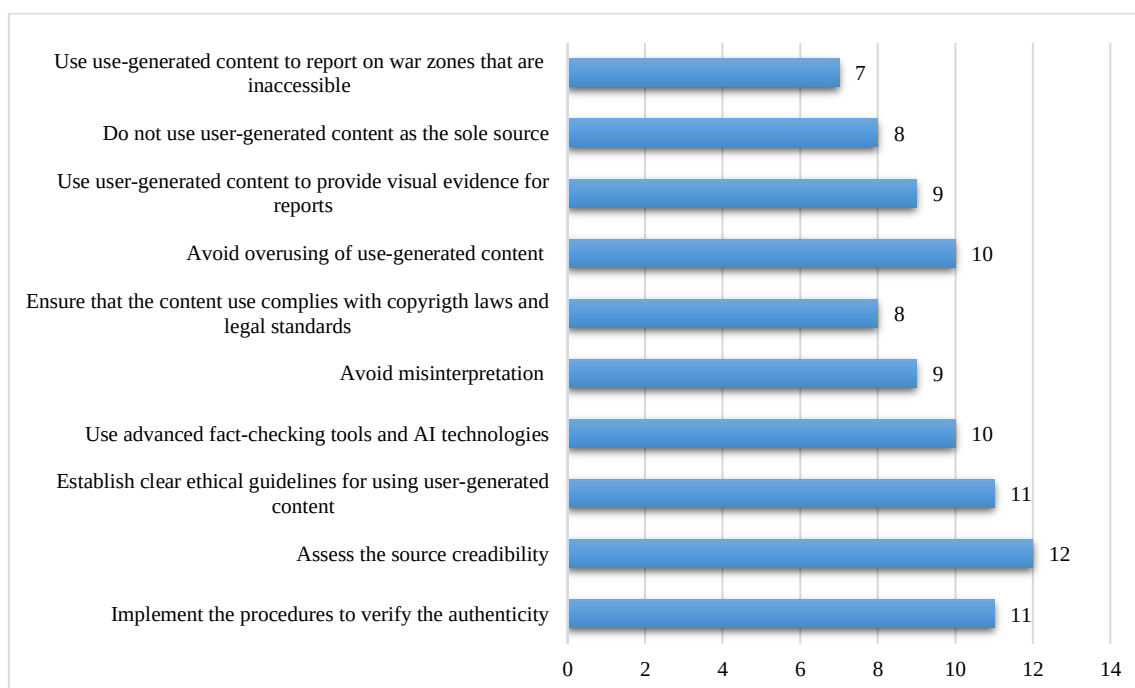


Figure 7. Recommendations on the integration of UGAVC in war news reporting.

Source: Author's development.

Therefore, the research focuses on the interplay between professional war journalism and UGAVC, investigating the opportunities and challenges of integrating this content into news reporting. It showed the necessity of developing ethical guidelines to verify and contextualise UGAVC, ensuring its responsible use while preserving journalistic standards.

The study is not without its limitations. First, a limited sample size may restrict the generalizability of the results. Second, the validity of the questionnaire was impacted by inexact question phrasing and reliance on self-reported data. These limitations prove the need for a cautious interpretation of the study's conclusions and underscore the importance of refining research instruments and methodologies in future investigations.

The research concerns significant implications for journalism, media studies, and conflict reporting. It emphasises the necessity to elaborate the frameworks for verification, ethical use, and contextualisation of UGAVC, particularly in conflict zones where misinformation has negative consequences. For example, the findings will be helpful in the development of advanced verification processes and adopt technological tools, such as AI-based content analysis, to ensure the authenticity and reliability of UGAVC. Moreover, the research underlines the importance of training professional war journalists in digital literacy and ethical decision-making to effectively integrate UGAVC into their reporting practices. In this context, this study may contribute to developing an advanced training program for early-career war journalists in Ukraine to use strategies for using UGAVC responsibly and effectively in a rapidly evolving media landscape.

Conclusions

The study shows that UGAVC spreads rapidly during the war. It is used to complement news stories and fact-checking for publishing and research. Also, the cross-sectional study showed that Telegram and Facebook are extensively utilised for sourcing UGAVC. Other platforms include Twitter, Instagram, and TikTok, but professional war journalists do not frequently select them. At the same time, the special attention was paid to verifying UGAVC. The results prove that consulting with experts is the most preferred strategy. Other journalist strategies include cross-referencing with official sources, geolocation, reverse image search, and implementation of visual verification platforms.

The study revealed that UGAVC offers significant benefits and poses notable challenges in journalism, particularly war reporting. Among its advantages, UGAVC provides enhancement of the ability to cover stories in inaccessible areas, providing unique perspectives on events compared to traditional sources, more effective engagement with audiences, speeding up the news reporting process, and improving the diversity of voices in news reporting. At the same time, the findings showed that participants face difficulties verifying the authenticity of UGAVC, maintaining professional standards, and technical difficulties in editing and processing sensitive content. Also, many professional journalists have concerns about the ethical implications of UGAVC and issues regarding copyright. Then, the impact of UGAVC on audiences was studied, and the cross-sectional study revealed that the use of UGAVC in war news reporting by professional journalists causes stronger emotions as well as anxiety and stress. Also, it fosters a sense of urgency, influences audience opinions and motivates them to take action. In some cases, UGAVC builds trust in news reports, but some journalists admitted its ability to spread misinformation.

The recommendations for integrating UGAVC in war news reporting were developed during the research. They included the following: using UGAVC to report on war zones; avoiding UGAVC as the sole source; using UGAVC to provide visual and audio evidence for reports; not overusing UGAVC; implementation of copyright laws and legal standards of using UGAVC; avoiding misinterpretation; introduction of fact-checking tools; establishment of clear ethical guidelines for using UGAVC; assessment of UGAVC source credibility; and implementation of procedures to verify the authenticity of UGAVC.

The study makes an original contribution by offering a comprehensive understanding of the interrelations between professional journalism and UGAVC in conflict zones. Unlike previous studies that often focus on the technological aspects of UGAVC or its ethical dilemmas, this research examines its integration into journalistic workflows, clarifying its impact on modern reporting practices. This contribution is especially significant in the digital transformation of journalism, where UGAVC shapes news reporting, particularly from conflict zones with limited access.

Importantly, the findings significantly impact both theory and practice. Theoretically, the study advances the discourse on participatory journalism by showing the collaboration between professional journalists and citizen contributors. It provides a foundation for further theoretical exploration into the co-creation of news content and the ethical tensions arising from this collaboration. Practically, the study emphasises the need for media organisations to develop advanced training programs to address the challenges posed by UGAVC.

Future research could explore the long-term impact of UGAVC on the audience, particularly in conflict zones where information warfare is prevalent. Additionally, the research could examine the psychological implications for journalists who integrate UGAVC into their news reporting. Further studies could also concern technological advancements, such as AI tools and blockchain, for verifying UGAVC and addressing issues of trust and accuracy in real-time reporting. It is worth mentioning that future research

could focus on cross-cultural variations in UGAVC usage, examining the impact of cultural context or regional dynamics on journalistic practices and the role of citizen journalism in conflict zones. These investigations could lead to the development of more accurate and reliable news reporting, ensuring that content from conflict zones like Ukraine is verified and reveals objective narratives.

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Spiritual security of Ukrainian society in the conditions of information warfare

Духовна безпека українського суспільства в умовах інформаційної війни

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Abstract

The essential characteristics of the spiritual security of Ukrainian society are analyzed. It is noted that spiritual security is a system-forming factor in the development of a democratic state in Ukraine in the conditions of an information war and a full-scale Russian invasion. The sources of threats and the main threats to the spiritual security of the national society caused by the information war are revealed. The value bases of the spiritual security of the Ukrainian state have been studied. Dialectical, structural-functional and comparative methods were used in the research process. The article states that the spiritual security of the national society is aimed at protecting national values and development priorities, the mental and civilizational basis of the existence of the Ukrainian people and preserving its cultural identity in the global processes of modernity. The conclusion is drawn that the restructuring of the

Анотація

Проаналізовано сутнісні характеристики духовної безпеки українського суспільства. Зазначено, що духовна безпека є системоутворюючим чинником розбудови демократичної держави в Україні в умовах інформаційної війни та повномасштабного російського вторгнення. Розкрито джерела загроз та основні загрози духовній безпеці вітчизняного соціуму, що спричинені інформаційною війною. Досліджено ціннісні основи духовної безпеки української держави. У процесі дослідження було використано діалектичний, структурно-функціональний та порівняльний методи. У статті зазначається, що духовна безпека вітчизняного суспільства спрямована на захист національних цінностей і пріоритетів розвитку, ментально-цивілізаційної основи існування українського народу, на збереження його культурної самобутності в

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hierarchy of values in the consciousness of Ukrainian citizens, as the basis for the existence of spiritual security, occurred most intensively during pivotal historical events – the Orange Revolution (2004-2005), the Revolution of Dignity (2013-2014), and the Russo-Ukrainian War of 2022.

Keywords: spiritual security, information war, values, national idea, information society.

глобальних процесах сучасності. Робиться висновок, що переформатування ієрархії цінностей у свідомості українських громадян, як підґрунтя існування духовної безпеки, відбувалося найбільш інтенсивно під час доленосних історичних подій – Помаранчева революція (2004-2005 р.р.), революція Гідності (2013-2014 р.р.), російсько-українська війна 2022 р.

Ключові слова: духовна безпека, інформаційна війна, цінності, національна ідея, інформаційне суспільство.

Introduction

The system of national security of the state constitutes a unified complex of military-technical, informational, economic, socio-political, spiritual and other factors. Each of them should complement and enrich the other, creating a safe system of coordinates for the existence of all subjects of social interaction. In particular, the spiritual security of society is the foundation for the preservation of statehood and prosperity of the nation in the global hybrid struggle. One of the forms of such struggle are information wars, which are permanently ongoing with varying degrees of intensity between different states and groups of states. The latest information technologies have made it possible to effectively fight for the subjugation of states and nations without capturing their territories, without human sacrifices and the loss of various kinds of resources, but only through massive influence on the public consciousness and spiritual sphere of the enemy state. Undoubtedly, information wars are a struggle for the consciousness of citizens, for dominance in the spiritual and value sphere of one or another society.

Scientists claim that "information wars are a manifestation of both economic, political, cultural and religious confrontation, and reflect the value differences of cultures, civilizations, peoples, political and legal systems" (Danilyan et al., 2020, p. 463).

In such conditions, not only the role and importance of the information security of the society is actualized, but also the spiritual security acquires special importance for the state-building and nation-building processes in modern Ukraine. In our opinion, the concept of "spiritual security" is much more voluminous compared to the concept of "informational security", since it includes deep layers of culture, mental characteristics and peculiarities of the nation's development, its historical experience interpreted in scientific works and fiction, etc. That is why the object of our research will be spiritual security.

Thus, for a comprehensive analysis of the research problem, we have structured the article to include several key sections. The introduction outlines the practical and theoretical relevance of spiritual security in the information society. The literature review provides a concise overview of the scholarly sources that underpin our research. The methodology section presents the methodological framework and research tools employed in the study. The discussion critically examines various perspectives on the issue of spiritual security in contemporary conditions. Finally, the conclusion summarizes the contribution of this research to the field and suggests directions for future studies.

Literature Review

The issue of spiritual security has become the object of scientific research in various paradigmatic dimensions. Thus, V. Baranivskyi emphasizes that spiritual security is an important factor in the existence of the nation and the state, and neglecting it can lead to the disintegration of the country (Baranivskyi, 2013). In turn, V. Krutov notes that spiritual security and spiritual factors in general should become the foundation of a new paradigm of human development in the 21st century (Krutov, 2012). Scientist V. Klyus reveals the essence of threats in the spiritual sphere of society, classifying them into two groups: threats that pose a danger to the spiritual world of man and threats to the established functioning of all forms of social consciousness and mentality (Klyus, 2014).

At the same time, this body of research does not devote significant attention to the threats to spiritual security arising from the development of the information society and information technologies. These include the application of methods of informational violence, the use of information-psychological operations, and the advancement of information weapons, among others. It is precisely these threats that constitute the substantive content of contemporary information wars.

A separate group of scientists analyzes the origins and vectors of threats in the spiritual sphere of Ukrainian society. In particular, A. Sukhorukova notes that the sources of threats to the spiritual security of the domestic society can be classified as external and internal and pays considerable attention to their disclosure (Sukhorukova, 2010). From the point of view of L. Veselska, one of the main threats to the functioning of the spiritual sphere of Ukraine is value polarization, which arises on the basis of the confrontation of value subsystems and is a continuation of regional, linguistic, ethnocultural and other worldview features that historically existed in our country (Veselska, 2010).

Analyzing the scholarly works of the aforementioned experts, it can be observed that the interrelation between internal and external threats to spiritual security is not systematically addressed. Additionally, there is insufficient specification of the impact of value system deviations on spiritual security.

Considerable attention in modern scientific discourse is paid to the means of countering the informational aggression carried out against Ukraine. Domestic researcher O. Kurban in the monographic study "Information Wars in Social Online Networks" claims that an effective means of resisting information attacks against our state should be the creation of a total mental barrier based on statist ideologues, adequate knowledge of history and modernity of the Ukrainian people (Kurban, 2017). According to P. Lisovskyi, the spiritual security of Ukraine should be ensured not only by national resources, but also by the participation of our state in international structures at the subregional, regional, transregional, and global levels (Lisovskyi, 2006; Lisovskyi, 2007). According to S. Larin, under the conditions of modern Ukrainian reality, the national security of the state (spiritual in particular) should be based on the practical implementation of such a triad: national values – interests – goals (Larin, 2016).

Building on the research of these scholars, we aim to strengthen specific aspects formulated in their works: the role of education and culture in countering informational threats and reinforcing the foundations of spiritual security, analyzing the state support for cultural entities, and providing a "value profile" of contemporary Ukrainian identity in the context of the studied issue.

A number of researchers, G. Sytnyk (Sytnyk, 2004), L. Belovetska (Belovetska, 2017), B. Burkinsky, V. Stepanov (Burkinsky & Stepanov, 2017), S. Ponomarevskyi (Ponomarevskyi, 2012) offer their own interpretation of the essence, functions and classification of national values as the basis of the spiritual security of our people at the current stage of national state-building, which is characterized by permanent aggressive informational influences against Ukraine. In this context, we note that a separate group of scientific works is devoted to the Ukrainian national idea as the quintessence of national values and the basis of spiritual security and state-building processes in Ukraine. This issue was reflected in the scientific research of such specialists as O. Duz-Kryatchenko, E. Lysitsyn (Duz-Kryatchenko & Lysitsyn, 2014), M. Rozumnyi (Rozumnyi, 2006), O. Kuts (Kuts, 2013), V. Pasichnyk (Pasichnyk, 2013).

This body of scholarly research consistently and systematically explores the understanding of the Ukrainian national idea and its value-based content. Drawing on these reflections, our article aims to define the dialectical unity of the national idea, national values, and national interests of the Ukrainian people and to correlate them with the level of spiritual security in Ukraine at the current stage of state-building. Additionally, we consider it essential to analyze the directions of development of the Ukrainian national idea as a foundation for spiritual processes in the country.

Based on the above, the goal of our scientific investigation is to clarify the essential characteristics of the spiritual security of Ukrainian society as a system-forming factor of national state formation in the conditions of information warfare.

Methodology

The methodological framework of our study was selected considering the specific features of the object, subject, formulated aim, and research objectives. To ensure the highest possible objectivity of conclusions,

a wide range of scientific methods was employed, providing a comprehensive approach to the study. The main ones include methods of analysis and synthesis, as well as dialectical, structural-functional, and comparative methods.

The method of analysis allowed us to break down the phenomenon of "spiritual security" into its key elements and aspects, as well as to examine the theoretical and methodological frameworks for interpreting spiritual security in the context of increasing informational threats. This method served as the foundation for analyzing each component of spiritual security, identifying their characteristics, interconnections, and contradictions. Conversely, the method of synthesis facilitated the integration of the analyzed elements, enabling the formation of a comprehensive understanding of spiritual security. This method proved to be an effective tool for integrating the philosophical, value-based, social, and anthropological dimensions of spiritual security, contributing to the establishment of a system of interrelations among them. Synthesis also allowed us to identify key trends and patterns in the development of spiritual security within contemporary global information wars. The combined use of analysis and synthesis methods enabled an in-depth examination of the fundamental transformations in approaches to spiritual security, a comparison of their characteristics, and an assessment of their practical implementation.

In particular, the dialectical method made it possible to reveal the internal and external connections and characteristics of the phenomenon of "spiritual security" in the context of its interaction with other social phenomena and processes. Also, this method was laid as a basis for understanding the consequences of information warfare on the spiritual security of Ukraine. The dialectical method enabled us to reveal the interdependence between external and internal threats to spiritual security in the context of the information society, as well as to identify trends in the evolving interpretation of security processes in general. The application of the dialectical method, combined with analytical and synthetic operations, allowed us to examine the genesis of the phenomenon of "spiritual security" within the framework of information warfare, uncover interconnections between various philosophical, cultural, and political theories, and analyze the transformation of approaches to defining concepts, scopes, and mechanisms for ensuring spiritual security at the current stage of national state-building.

The structural-functional method became the basis for understanding the place and role of spiritual security in the national security system of the Ukrainian state and determining the interaction of its elements with subsystems of information security. Thanks to this method, it was found out what social and national values are the basis of Ukraine's spiritual security at the current stage of development. It has been clarified that the foundation of a state's spiritual security system should be the integration of three structural elements: national values, national interests, and national development priorities. The application of the structural-functional method has led to a deeper understanding of the unique role of the national idea in protecting the state's spiritual security during information warfare. It serves as the ideological core of the nation's spiritual resistance and as a value-based barrier.

The comparative method was used to reveal the dynamics of transformations of value orientations of Ukrainian citizens, starting from 2014 and ending with the present. This method made it possible to state that the reformatting of value orientations in public consciousness in recent years has led to the primacy of European values of a democratic direction. Overall, the application of the comparative method was carried out in the following areas: comparing the hierarchy of value orientations in public consciousness, analyzing Ukrainians' attitudes toward NATO and EU membership in the context of security guarantees in all its dimensions, examining changes in Ukrainians' perception of vital values, political and civic axiological constructs, as well as values of self-realization and pro-social values. The obtained results were interpreted to understand the trends and challenges of spiritual security in the context of information warfare.

An axiological approach has complemented the structural-functional and comparative methods in the study of the value-based foundations of spiritual security. This approach has served as a crucial tool for examining spiritual security as a value system that reflects the fundamental values, beliefs, and ideals of the harmonious existence of modern society. Through this approach, the key types of values within the Ukrainian axiological space, which are essential for secure state-building, have been analyzed. Consequently, the axiological approach has refined the essential and substantive aspects of perceiving value constructs (national idea, national values, national interests) as factors in strengthening spiritual security.

The proposed methods constitute an interconnected set of theoretical and applied tools for studying spiritual security in the context of information warfare.

Results and discussion

The development of the information society and information technologies has given modern man a number of new opportunities for communication, education, performance of professional functions, manifestation of creative abilities, but at the same time it has become the basis for the erosion of traditional social values, the leveling of spiritual landmarks. Experts state that "There are collisions between traditional forms of sociality and new realities that are radically different from them, including virtual reality" (Bytiak & Danilyan et al., 2020, p. 220). Accordingly, the number and quality of threats to the spiritual security of societies, states, and individual citizens is increasing.

In modern scientific research, specialists reveal various theoretical aspects and practical problems of the implementation of spiritual security. Thus, V. Baranivskyi notes that:

... spiritual security is a system of conditions that allows some social entity (culture, society) to preserve its vital parameters within the limits of the historically developed norm. Their going beyond the norm under the influence of various factors (primarily of a cultural, value-normative nature) leads to disorganization, and in the end - to a national catastrophe, that is, to the disintegration of society as a whole system in connection with the destruction of those elements that create its spiritual foundations (Baranivskyi, 2013, p. 209).

Obviously, the spiritual security of society is aimed at the protection of national values and development priorities, the mental and civilizational foundations of the existence of the Ukrainian people, the preservation of its cultural identity in the global processes of modernity, in particular in the global information struggle.

According to experts, the most optimal and effective way to general peace and security, to dialogue between civilizations, peoples and people lies through the study and development of spirituality. It, as a key category of the new humanitarian paradigm of the 21st century, can be considered based on the analysis of threats, risks and dangers and aimed at achieving the national goal, social ideal, basic values and vital interests of society. Based on the concept of "spirituality" ("spiritual security"), it can be assumed that in the 21st century, humanitarian components, primarily spiritual, will occupy an increasing specific weight in security systems from an individual to the international community. According to V. Krutov: "By combining the efforts of the government, society and scientists of all directions, a new philosophy of life can be created, focused on a decent understanding of life's values through the prism of spirituality" (Krutov, 2012, p. 199).

In solidarity with the thoughts of the previous author, we note that nowadays, any state must be ready to resist negative external influences, in particular, informational attacks aimed at the spiritual sphere of society's life. In recent years, Ukraine faced this problem in a particularly acute form - in the form of an information war, although latent informational aggression against our country was carried out throughout its independent existence. External informational and spiritual influence on the Ukrainian state was and is carried out through the distribution of appropriate television productions, books, newspapers, anti-Ukrainian content on the Internet, etc. Starting from February 2022, the information war against Ukraine was supplemented by a large-scale invasion of Russian troops, and information attacks became more intense and destructive.

Undoubtedly, threats in the spiritual sphere, although they have a hidden nature, have a negative impact on socio-political processes and the safety of society. The first group includes the danger of destruction of a person's spiritual world, which threatens the formation of his consciousness, worldview foundations, freedom of thought, beliefs, and intellectual activity. The second group are threats to the established functioning of all forms of social and mass consciousness and mentality. In this context, V. Klyus rightly notes that threats to the functioning of the spiritual foundations of Ukrainian society include:

- ... Gradual displacement of higher values and ideals by pragmatic, technocratic orientations, globalizing imperatives of thinking;
- Devaluation of moral values, cultural national traditions, universal human values;
- The activities of non-traditional neo-religious cults and totalitarian sects, pseudo-spiritual and informal organizations that impose their own, often anti-social values on people's minds, break family ties, and promote socio-political indifference (Klyus, 2014, p. 77).

It is worth noting that spiritual violence has become an immanent feature of the modern world and has found its manifestation in various forms, both open and latent. In this sense, the subjects of the spiritual security of society must oppose such violence, take steps to reduce the intensity of its influence on public consciousness, culture, traditions, etc.

According to V. Gorlynsky, there groups of threats and dangers that manifest themselves in the spiritual sphere of modern Ukrainian society:

- ... Threats to the established functioning of all forms of social and mass consciousness and mentality;
- Threats to the development culture of the entire Ukrainian society, its ethnic and religious communities, as well as threats to the functioning of such socio-cultural institutions as science, morality, education, upbringing, art, religion (Gorlynsky, 2006, p. 32).

In general, according to specialists, a threat to spiritual security can be defined as a set of events, phenomena, processes, and other factors that cause danger to the spiritual sphere of an individual, society and the state and harm their vital interests. If we define "the essence of the concept of "sources of threats to spiritual security", then these are forms of influence on the spiritual sphere of society aimed at the destruction of culture, mastery of mass and individual consciousness and its valuable content with the aim of destabilizing society" (Maslova, 2012, p. 3-4).

From our point of view, sources of threats to spiritual security can be classified into external and internal. Sources of external threats include: the policy of individual countries aimed at dominating the cultural and spiritual spheres, at opposing the free development of the country's own cultural and spiritual tradition, blocking equal participation in the international distribution of the cultural heritage of mankind, planting a foreign ideology; deployment of "cultural expansion" by individual countries of the world in relation to other countries. In Ukraine, this manifested itself, in particular, in the desire to reduce the use of the Ukrainian language as a means of communication and thus reduce the participation of citizens in the Ukrainian information space, as well as in the support of cultural dependence, creating an artificial demand for mass culture; the development of concepts of "information war" by individual states, which involve the creation and use of means of dangerous influence on the spiritual sphere of other countries with the aim of disrupting its normal functioning and unauthorized access to all internal resources of the country; criminal activity of religious sects, organizations and individuals in the spiritual sphere; the activity of economic and political structures in the spiritual sphere, which is directed against the national interests of the country.

A. Sukhorukova considers the following sources of internal threats to spiritual security:

- ... The country's lagging behind the world's leading states in terms of the level of information society, which limits the country's ability to protect its own cultural tradition and equal cultural exchange between nations;
- Low general level of education (or its quality) of citizens, which makes it difficult for a person to resist destructive influences from the outside;
- Ineffective legislative framework for the protection, dissemination and strengthening of traditional national ideals and values (Sukhorukova, 2010, p. 10).

Concreting the reflections above, experts note that a serious danger for the functioning of the national society spiritual sphere is the value polarization of social consciousness. Value polarization arising from the confrontation of value subsystems, speculation, and manipulation of them is a source of threats to social stability. According to L. Veselska:

... knots of socio-cultural tensions are formed on the basis of contradictions between value priorities of the national-state, regional, interregional and global levels; ethnocentric and civilizational values; opposite vectors of geopolitical and sociocultural orientations; by various value subsystems of both ethno-national and religious-confessional nature; value bases of classes, social strata and groups located at the poles of income distribution and living standards; value systems of opposite ideological and socio-political orientations (Veselska, 2010, p. 5).

Therefore, the implementation of information war (or aggression) against the state is greatly facilitated when there is a spiritual-value split, value conflict, value polarization or value confrontation. In this regard, M. Ryabchuk aptly remarks: "A divided nation is not only internally unstable. It is also fatally vulnerable

to external threats, as shown by the events of 2014-2015, in particular the relative success of separatism fueled by Russia in Crimea and Donbas" (Ryabchuk, 2015, p. 2).

Obviously, the conflict of values is difficult to solve because the stereotypes of the mass consciousness are quite stable, and it is quite problematic to change them. It is impossible to convince those who refuse to accept the new rules of life. It is necessary to consider the fact that social consciousness is characterized by conservatism regarding certain social phenomena, even if the objective conditions change significantly and bring to life new corresponding value-normative ideas. Changing consciousness is a complex, subtle and contradictory process.

P. Lisovsky proves: "The stronger the old types of value orientations are fixed in the consciousness of the individual, the more acutely this process occurs. It should be noted that such a situation leads to the fact that new values are not taken seriously, are not assimilated organically" (Lisovsky, 2007, p. 58).

Analyzing the above-mentioned threats to the spiritual security of Ukrainian society, a natural question arises about the methods of protection against them, the development of means of their reduction and neutralization. We believe that the most reliable means of combating information attacks is the creation of a total mental barrier that can withstand any surprises. At the same time, the recipients of information will be in certain ideological positions, which will enable them to critically perceive or not react at all to harmful information. In this regard, O. Kurban notes that "the formation of this kind of protection is a complex work, to which it is necessary to involve the efforts and resources of society, the state, and individual public leaders" (Kurban, 2017, p. 158).

In our opinion, the basis of such work should be an effective system of education and civic education of the population, which is based on the principles of systematicity, pluralism, democracy and criticality. Protecting the spiritual security of Ukrainian society in the conditions of informational aggression, state bodies and public organizations should act in a coordinated manner, focusing on patriotic guidelines, national and universal values.

Spiritual security as an element of national security of any country cannot be fully ensured by its own forces alone without close cooperation with influential international structures at the sub-regional, regional, trans-regional and global levels. This tendency was especially manifested during the deployment of civilized countries in a large-scale fight against international terrorism. In connection with this, the role of special intelligence and counterintelligence services in the system of ensuring the spiritual security of modern Ukrainian society is significantly increased. An important role should be played by the spiritual (intellectual) consolidating elite as a carrier of basic knowledge. As P. Lisovsky emphasizes: "Carrying out comprehensive measures to increase efficiency in the field of spiritual security requires improvement of the legal framework, optimization of relevant organizational structures, comprehensive material and financial support" (Lisovsky, 2006, p. 129).

In general, the spiritual security of Ukrainian society can be effectively ensured only through the constant protection of the national cultural space by all entities involved in this process. As rightly noted by O. Domanska in this regard:

The cultural national space is the space where such "weak" spiritual Ukrainian values as brotherly love, sincerity and mutual respect are really supported by all members of the community and act. Therefore, the spiritual essence of Ukrainian statehood is absolutely unique, as well as the form that is supposed to protect this essence. The state must fight the danger for the Ukrainian and the entire nation, and the entire history of Ukraine testifies to this danger: being deceived and used, enslaved and plundered (Domanska, 2015, p. 203).

Undoubtedly, to strengthen the spiritual security of Ukrainian society, the state should in every way contribute to the development of subjects in the field of education, science and culture, providing adequate funding, legal framework, etc. As leaders of moral and spiritual values, the subjects of the cultural sphere, first of all, should promote the development of humanitarian values, generally accepted norms of behavior, ethics, attract and acquaint society with the achievements of domestic and foreign cultural heritage.

Analyzing the current situation of the subjects of the cultural sphere of Ukraine, it can be stated that the sphere of culture is financed according to the "residual" principle, the role of similar institutions in society

is negated, the state has left this sphere alone with the conditions of the market economy, which practically condemns many subjects not to development, and on survival or death in market conditions.

Therefore, to strengthen the spiritual security of society, it is necessary to reproduce and develop national values that would correspond to the interests of the Ukrainian people and the strategy of national state-building. Examining the domestic reality, it is noteworthy that under the conditions of modern Ukrainian reality, the practical implementation of the triad: national values - interests - goals, which are traditionally the basis of ensuring national security, is held back by the insufficient level of consolidation of Ukrainian society, which leads to the fact that interests, and even more so - the goals of different social groups quite often acquire an antagonistic character, which makes dialogue between them and understanding for the sake of the common good. At the same time, it is obvious that Ukraine's statehood is based on values, the protection of which is a determining prerequisite for its security and the well-being of its citizens. S. Larin proves that such values are: independence; peace and international cooperation; preserving the identity of the Ukrainian people; well-being (Larin, 2016, p. 48).

In this context, G. Sytnyk emphasizes that "national values decisively determine the essence, integrity and stability; interests - structure and character; goals - the configuration and orientation of the formation and functioning of the national security system" (Sytnyk, 2004, p. 12-13).

Values, by their very nature, are a rather conservative phenomenon that, on the one hand, ensures the stability of the nation's existence, and on the other hand, inhibits social transformations. As evidenced by the experience of Ukraine, the most dynamic understanding of values and their hierarchy changed during fateful historical events - the Orange Revolution (2004-2005), the Revolution of Dignity (2013-2014), the Russian-Ukrainian war of 2022. , which contributed to the active formation of civil society, a political nation, demonstrated the value priorities of the people of Ukraine. Citizens showed their ability to fight for democracy, human rights, European values, protecting the spiritual security of society in the conditions of informational and full-scale aggression against our state.

The analysis of the dynamics of value priorities of the population of Ukraine for 2012–2014, conducted by the Institute of Sociology of the National Academy of Sciences of Ukraine, testified to the following value changes and trends:

Even though during the events of 2014, the mentality of Ukrainians continued to be characterized by the dominance of security values (welcoming values), the indicators recording political and civic values increased statistically significantly, as well as self-actualization and prosocial values. The importance of patriotism, democracy, solidarity, cultural competence, traditional, historical, and religious values has increased in the mentality of society (Ruchka, 2014, p. 124).

In the following years, there is an increase in the number of supporters of European values in Ukraine. However, sociological surveys prove that the attraction of Ukrainians to Europe is based on material, economic and legal principles, on the other hand, they are not ready to fully accept European values in the form in which they exist in the modern EU. This is evidenced by the results of the sociological study "Who are we: a portrait of Ukrainians through the eyes of Ukrainians", conducted by the Ukrainian Institute for the Future¹:

Most Ukrainians perceive European values rather through the categories of order, legality, equality, justice and wealth than through the categories of individualism, freedom of religion, human rights, freedom of thought and expression of opinions, freedom of self-expression, tolerance or inclusiveness. In particular, in questions about the definition of European values, all age groups were united in the fact that it is, first of all, decent pay for work (42% - 46%), decent working conditions (38% - 43%), freedom of speech (33% - 38 %), equality of all before the law (31% - 35%) and the rights of the LGBT community (10% - 26%). When asked about the European values Ukrainians perceive, the majority in their answers gave preference, again, to more down-to-earth, pragmatic and conservative categories related to their own socio-economic well-being: family (42% - 46%); decent wages (35% - 41%); decent working conditions (33% - 39%); freedom of speech (26% - 37%); health (36% - 39%); well-being (27% - 31%); equality of all before the law (25% - 29%); protection of private property (19% - 22%). For most Ukrainians, the feeling of belonging

¹ The sociological survey was conducted from July 17 to August 1, 2021 in five macro-regions of Ukraine: West, East, South, Center and Donbas. 5,000 respondents aged 18 and older took part in the survey. The statistical error does not exceed 1.41%

to Europe (and therefore to common European rituals, images and cultural codes) is very important for the self-identification of Ukrainians, for their self-perception and awareness of themselves as a certain part of the world (Kotenskyi, 2021).

It is worth noting that with the beginning of the Russian-Ukrainian war in 2022, security values were updated and the number of supporters of joining NATO increased. A sociological study conducted on July 6-20, 2022, by the Kyiv International Institute of Sociology (KIIS) is illustrative:

In the event of a referendum on joining the EU, 81% of Ukrainians would vote "for" joining. "Against" joining the EU - 4%. Others (15%) would not participate in voting or do not know how to vote. In the case of joining NATO, most Ukrainians would also vote "for" - 71% of all respondents, while 7% would vote "against". 22% of the population would not participate in voting or do not know how to vote. Compared to June 2021, the share of those who support joining the EU increased from 52% to 81%. Also, during this period, the share of those who support joining NATO increased from 48% to 71%. In addition, in the case of the EU, from 19% to 4%, and in the case of NATO, from 24% to 7%, the share of those who oppose Ukraine's membership in these organizations decreased (Hrushetsky, 2022).

Therefore, the national interests of the state, together with political, military, economic and ecological security, also include the spiritual security of the Ukrainian people, which involves the protection and affirmation of its dominant values. L. Belovetska claims: "The key to reviving the historical and spiritual potential of the Ukrainian people is not only rich natural resources, but first of all the uniqueness of spiritual wealth, which preserves the language of the people, promotes national self-awareness and identification" (Belovetska, 2017, p. 11).

In general, ensuring spiritual security based on national and cultural values is an important condition for the survival of the nation and the state, and the preservation of its subjectivity in the international arena.

Domestic researchers B. Burkinsky and V. Stepanov grouped the full set of values (primarily spiritual) necessary for the safe life of the state into three system blocks according to the following parameters: "national spirit", "quality of life" and "creative abilities". The content of these parameters is reduced to the following:

- 1) National spirit; according to this parameter, the aforementioned researchers identified such basic values as spirituality ("the soul of the people"), altruism, empathy, tolerance;
- 2) The quality of life of the people as the main concept of its survival and progressive, sustainable development. This criterion allowed specialists to determine the value of human life, the value of private life (love, family, children), the quality of human capital;
- 3) Creative ability (creativity) of the nation; according to this parameter, scientists singled out such values as collectivism, creativity, innovation, striving for perfection (Burkinsky & Stepanov, 2017, p. 47-48).

So, the universal modern Ukrainian value system can be outlined around traditional national priorities that form the basis of the Ukrainian mentality, which are represented by patriotism, the desire for harmony, well-being, conscientious productive work, national dignity, international tolerance, kinship, hospitality, ritualism, spirituality, religious and national tolerance, love of freedom and others, as well as the inclusion of those value guidelines that are dictated by the features of life in the modern globalized world, which is built taking into account generally accepted democratic values - social unity and stability, security and well-being, priorities of civil rights and freedoms, equality and human dignity, desire for integration processes, development of linguistic and educational spheres.

Reflecting on the problem of spiritual security of the national society, it is impossible to ignore the peculiarities and essential characteristics of the Ukrainian national idea as a consolidating factor in state-building processes. The national idea, by its nature and functions, is the core of the spiritual development of any nation, strengthens its spiritual and informational security. As V. Pasichnyk states: "On this basis, it is possible to achieve a balance of the interests of the individual, society and the state and, therefore, to restore social balance, to ensure the stable and harmonious functioning of the national body, society in general" (Pasichnyk, 2013, p. 42).

Experts believe that the national idea can be interpreted as a strategic goal of national progress, a product and an expression of national self-awareness. This definition contains two important components of the

national idea. The first is that the national idea is a form of mental understanding by the nation of its psychological and cultural content, that is, its characteristic temperament, abilities, inclinations, habits, customs, relation to the cosmos, including to the land on which it lives, to other peoples and nations, which is attributed to the concept of "national self-awareness". The second is a form of mental understanding of the original values of one's existence and the goals of one's activity, which derive from the latter. Therefore, "the national idea is the sum of "national self-awareness" and "the strategic goal of national progress" (Duz-Kryatchenko & Lysitsyn, 2014, p. 48).

The significance of the national idea in ensuring the spiritual security of Ukrainian society is most clearly manifested in the functions it performs. In particular, O. Kuts refers to such functions: ethnonation-forming; integrative; identification; cultural; axiological; state-building (Kuts, 2013, p.100).

The national idea should correspond to the current state of development of the Ukrainian nation and combine both the traditional values of Ukrainianness and the latest value priorities. Researcher M. Rozumnyi singles out three groups of factors that determine the dynamism and constructiveness of the development of the national idea:

The first group is the action of cognitive factors of social consciousness, which are focused on the very concept of an idea. The second group of factors can be conventionally united under the name of national genetics. Finally, the third group of factors is the dynamics of civilization, because we live in a time when huge masses of people have moved from a state of rest to a state of movement (Rozumnyi, 2006, p. 401-404).

Thus, spiritual security as a dynamic phenomenon requires a constant search for new algorithms for its provision, based on the challenges and threats faced by modern Ukrainian society. Also, it should be based on the strategy of modern national development and a wide range of subjects that provide it.

Conclusions

Therefore, the spiritual security of Ukrainian society is the key to the preservation of national identity, an important factor in the development of a democratic, European state in the conditions of information warfare, full-scale Russian invasion and global confrontation. The spiritual security of Ukrainian society is based on national and universal values and is aimed at protecting the national and cultural subjectivity of our people.

Having analyzed the dynamics of changes in the hierarchy of values among Ukrainian citizens (as a basis for the existence of spiritual security) during the period of independence, we came to the conclusion that their understanding changed most intensively during the fateful historical events - the Orange Revolution (2004-2005), the revolution Dignities (2013-2014), the Russian-Ukrainian war of 2022. These events contributed to the active development of civil society, the political nation, and demonstrated the value orientations of the people of Ukraine. Through active actions, the citizens of Ukraine showed their commitment to such European values as democracy, human rights, justice, security and demonstrated the ability to protect the national state and its values, first in the conditions of hybrid and information warfare, and later in full-scale aggression against our state.

In the future, the study of spiritual security in society should encompass the interaction of multiple forms, including state-institutional, cultural-educational, mental-civilizational, socio-economic, politico-legal, and information-technological, among others. As a component of national security, spiritual security in any country can no longer be fully ensured solely by domestic efforts without close cooperation with influential international structures at subregional, regional, transregional, and global levels, which are guided by democratic values. The interaction of these actors in ensuring spiritual security during information warfare requires further investigation.

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The role of social networks in shaping the identity and self-realisation of young people

Роль соціальних мереж у формуванні ідентичності та самореалізації молоді

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Abstract

The use of social media is one of the defining features of the modern world. This article aims to explore the role of social media in shaping youth identity and identify their potential as a tool for self-realisation (specifically using Ukraine as a case study). This mixed-method study combined interviews and a literature review. The target sample consisted of students (80 individuals) and experts in social interaction (45 individuals). The collected data were analysed using content analysis, comparison, and synthesis methods. The results indicate that both young respondents and experts equally recognise the importance of social media for self-presentation, finding like-minded individuals, and developing self-esteem. The key tags associated with social media are communication, interaction, texts, content, art, self-realisation, and socialisation. The main risks identified include bullying, developing a need for positive evaluation from others, "digital burnout," and an overemphasis on entertainment content. Countermeasures to such phenomena consist of conducting academic coaching to form identity and a correct vision of young people's prospects for self-realisation, as well as developing students' communicative competencies, stress resistance, and the ability to interact correctly with digital content and set priorities. In the conclusions, it is further emphasised that disseminating Ukrainian content (even entertainment-focused) through social media highlights new trends significantly more favourable to Ukrainian identity.

Keywords: Social networks, coaching, identity, professional self-realisation, risks.

Анотація

Використання соціальних мереж є однією із характерних ознак сучасного світу. Мета статті – дослідження ролі соціальних мереж у формуванні ідентичності молоді та визначення їхнього потенціалу як інструменту самореалізації (зокрема, на прикладі України). Дане дослідження поєднало методи інтерв'ювання та огляду наукової літератури. Цільова вибірка була сформована із здобувачів освіти (80 осіб) та експертів із галузі соціальної взаємодії (45 осіб). Отримані дані оброблено із використанням методів контент-аналізу, порівняння та синтезування. У результатах відзначено, що молоді респонденти й експерти однаково визнають важливість соціальних мереж для самопрезентування, пошуку однодумців, формування самооцінки. Головними тегами, які асоціюються із соціальні мережі є: комунікація, взаємодія, тексти, контент, мистецтво, самореалізація, спілкування. Найбільшими ризиками вказано булінг, формування потреби у позитивній оцінці від інших людей, «цифрове вигоряння», акцент на розважальному контенті. Протидії таким явищам полягає у впровадженні академічного коучингу як засобу формування ідентичності та коректного бачення перспективи самореалізації молоді, а також розвитку в студентів комунікативних компетентностей, стресостійкості, умінні правильно взаємодіяти із цифровим контентом та розставляти пріоритети. У висновках додатково наголошено, що розповсюдження у соціальних мережах українського контенту (навіть розважального) вказує на нові тренди, значно більш прихильні до української ідентичності.

Ключові слова: Соціальні мережі, коучинг, ідентичність, професійна самореалізація, ризики.

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Introduction

In a modern globalised society, the use of social media has become an integral element of daily life for young people, significantly influencing processes of self-identity formation, socialisation, and various aspects of self-realisation in both professional and personal spheres. Due to the rapid development of digital information environments and access to digital platforms, young individuals have gained unique opportunities for self-expression, exchanging ideas, and expanding their social networks. However, the emerging digital realities have also created modern challenges, particularly regarding the adverse effects of social media algorithms on self-perception, critical thinking development, social interaction, and integration into the community.

Identity plays a crucial role in these complex processes, undergoing noticeable and highly dynamic transformations in the modern world (Baker et al., 2019). In traditional societies, identity was primarily shaped within the framework of specific social groups based on longstanding cultural values and local traditions. In contrast, identity today increasingly results from individuals' constant interaction with multifaceted levels of the informational environment and its continuous evolution (González-Soriano et al., 2020). Popular contemporary social media platforms such as TikTok, Instagram, Facebook, X, and Messenger have become significant tools for exchanging valuable content. At the same time, these platforms serve as instruments for constructing personal identity and shaping worldviews through active digital interaction (Stoliarchuk et al., 2024). Young people utilise these opportunities for active self-presentation, consuming others' content, exchanging experiences, building personal brands, and seeking and asserting their place within an ever-changing society.

There are different approaches in modern scientific works on the role of social networks in forming the identity and self-realisation of young people. In particular, some scientists have pointed to a positive impact, the possibility of self-expression, development of creative skills and professional growth through digital platforms (Stoliarchuk et al., 2024). From this point of view, social networks contribute to the construction of personal identity, expansion of social capital and integration into global communities.

At the same time, there are other opinions. In particular, different authors have emphasised the risks, such as strengthening social comparison, reducing self-esteem, and distorting the accurate perception of oneself and the world. Thus, it is essential to characterise the complex role of social networks. Social media is one of the most prevalent sources fostering a sense of dependency among young people on the opinions of others (Tatem & Ingram, 2022). Such negative manifestations can lead to distorted self-perceptions and idealised content, significant discomfort caused by trolling or other forms of cyberbullying, and risks associated with undesired social comparison. Moreover, disinformation, including explicit propaganda and hate speech, scammers and algorithmic traps, can pose substantial barriers to forming healthy self-determination, evaluative judgements, understanding criticism and self-criticism, and overcoming obstacles to self-realisation.

Therefore, the article aims to analyse the role of social media in shaping youth identity and to determine its potential as a tool for self-realisation. Achieving this aim requires addressing several specific tasks:

- Investigating the influence of social media on processes of personal identity formation among young people;
- Assessing the potential benefits of social platforms for youth self-realisation across various spheres of social life, particularly professional contexts;
- Identifying the main challenges, risks, and barriers from direct interaction between young people and social media.

The gradual fulfilment of these tasks will enable the practical application of an interdisciplinary approach, combining sociological, psychological, and media research elements. This approach will facilitate the examination of both individual contexts of social media usage (including all positive and negative consequences) and the broader characteristics of young people's interaction with social media, considering its impact on the development of broader socio-cultural processes. The proposed research outcomes aim to enhance understanding of the influence of social media on the formation of modern youth identity, offering specific recommendations for optimising the use of digital social platforms and fostering harmonious psychological development among young individuals in an era of globalisation and societal digitalisation.

Literature Review

The challenges associated with identifying young people in the contemporary digital environment have repeatedly become the focus of analytical research. The objectives of such studies are diverse, from examining individual elements of digital technology integration into the complex socialisation process to identifying external factors that significantly influence young people's psychology, behaviour, and actions. Among the latter, particularly in the Ukrainian context, the ongoing war initiated by the Kremlin regime and supported by a majority of Russians (Derviş, 2023) holds special importance.

The influence of social media on youth identity formation

At the same time, the general influence of social media on shaping youth consciousness, fostering specific values, and introducing various markers that define their place in the digital environment is widely acknowledged (Charmaraman et al., 2021). Another promising research avenue lies in exploring social media and its relationship with sexuality. It is no secret that young people often experience insecurities about their appearance, with social media significantly impacting their self-perception. Among other effects, the psychological impact may hinder self-realisation – peer rejection can negatively affect aspirations in creativity, sports, the arts, and beyond (Tatem & Ingram, 2022). Education is no exception to this trend; thus, social media can pose notable barriers to self-identification and personal evolution (Kaldygozova, 2024).

Alternative perspectives on social media's role

Nevertheless, sceptical perspectives require reconsideration, as not all researchers agree with such conclusions or view technological progress (and social media as its product) negatively. For instance, Abu Safaqa (2024) argued that, in conditions of warfare and political instability, digitalisation could structure educational processes and aid psychological self-discovery and the search for one's place in the modern world. Similarly, Lin (2024) assessed the importance of such changes, including integrating technological innovations, from a philosophical perspective. Social media platforms undeniably belong to these innovative systems. Daudi (2022) reviewed scholarly concepts regarding the proliferation of narcissism among contemporary youth as a direct consequence of social media influence. Although his assessments remain contentious, it is worth noting that this phenomenon often reflects a lack of competencies in interacting with social media (e.g., communicative or digital skills) rather than being a widespread issue among young people. From another viewpoint, the formation of insecurities undermines creative self-realisation (and self-realisation more broadly), impedes communication, and complicates identity formation. The issue of psychological development, which undergoes multifaceted influence, will remain highly promising, particularly considering the continued growth of digital technology's impact on social evolution.

Digitalisation and social evolution

A critical research direction has become the study of the digital age with its societal manifestations, the emergence of new values, and perceptions of success, happiness, and more. Tiidenberg (2023) provided a comprehensive review of previous hypotheses regarding the importance of understanding the new principles governing society in the digital era. Consequently, the identity formation and self-realisation process among young people will also require evaluation through emerging paradigms. The COVID-19 pandemic significantly contributed to this discourse, catalysing the development of digitalisation and the introduction of remote learning and work, which immediately affected the usual rhythm of young people's lives. Krap et al. (2024) and Bobro (2024) focused on this issue to trace the changes caused by the active use of social platforms for communication (education, work, etc.) during strict lockdown measures. These researchers also highlighted the relevance of acquiring new competencies for effective functioning in the digital age (Cheng et al., 2024). This has opened prospects for further identifying local strategies to overcome the challenges of complex socialisation young people face in contexts of restricted mobility and traditional interactions. While this area has been partially explored, including through the potential application of social platforms (Manzi et al., 2018), the findings require further development, mainly by incorporating empirical data.

In contemporary studies, the impact of social media on youth identity formation and self-realisation has received limited attention. Against this backdrop, the work of Babich and Rybalko (2019) stands out for

tracing the peculiarities of education and upbringing among young people, highlighting key aspects of psychological development and the influence of the modern digital environment on these processes. However, this comprehensive study was conducted before the full-scale Russian invasion, meaning its findings require further analysis and updates in light of current practices of social media influence during wartime. This creates a significant research opportunity to examine contemporary challenges and perspectives on youth identification and self-realisation under martial law. Social media undoubtedly transforms into a vital communication platform, as physical interaction may be limited or impossible. Evaluations (including self-evaluations), interactions, creative expression, and communication paradigms – all of these aspects require further exploration, and it is proposed to be conducted using surveys and comparisons of collected data with expert opinions.

Methodology

Research Design

This cross-sectional study is based on expert surveys, allowing for a comprehensive exploration of the research problem. Contextual approaches enable an understanding of the specifics of Ukrainian realities, including those during wartime.

The choice of the cross-sectional type is because this type allows for the capture of informed perspectives and provides a high level of analytical content and relevance. Given that the study focuses on understanding youth identification processes in the contemporary media landscape, the input of intersectional analysis provides details that may not be easily accessible through general population surveys. The proposed research methodology facilitates an in-depth analysis of the identification processes of youth amidst the pervasive influence of social media on modern life, with particular attention to specific aspects of this issue. The study employs a comprehensive approach to gather the necessary data, including information obtained through the conducted survey. This approach ensures results that are supported by relevant empirical measurements. Furthermore, a comprehensive approach to data collection that combines expert assessments with structured survey data increases the reliability of the results. Hence, this methodological framework ensures that the study produces reliable results that significantly contribute to academic discourse and the broader scientific community.

Sample

The study considers expert opinions, for which a purposive sampling strategy was employed. Information about the proposed research was disseminated through social media, enabling interested individuals to participate in the survey. Social media was chosen to align with the study's primary subject and remotely introduce potential participants to the survey. The main criteria for forming the target sample were as follows:

1. Experience in social communications, psychology, or management.
2. Understanding of key issues related to identity formation and self-realisation.
3. Provision of consent for data processing.

Using these criteria, 65 potential experts were identified. However, 11 declined to provide complete information about themselves, and 9 failed to submit their consent for data processing within the stipulated timeframe. Consequently, 45 experts from various fields with experience working with youth participated in the survey. The expert evaluations provided significant insights into youth identity formation under contemporary conditions.

The study also incorporated opinions from students. Similarly, information about the survey was disseminated via social media. The main criteria for forming the student sample were:

1. Enrolment in higher education institutions.
2. Active use of social media.
3. Provision of consent for data processing.

89 students expressed interest in participating; however, 9 did not provide the necessary consent for data processing. Ultimately, 80 students participated in the survey.

Materials

For comparative purposes, scientific sources were identified through searches in bibliometric databases such as Scopus, Web of Science, and Google Scholar. Various scientific materials were used, including monographs, academic articles, and chapters in collective monographs. The selection of relevant information adhered to the following criteria:

1. Language: English or Ukrainian.
2. Chronological range: 2020–2024, with exceptions for works referenced in previous studies that are directly relevant to the research subject.
3. Thematic focus: The impact of social media on youth, including their socialisation, identity formation, and self-reflection.

Applying these criteria resulted in the selection of 40 academic sources that met the search criteria and were dedicated to the issues outlined in the study. (See Table 1.)

Table 1.
Searching strategy of relevant literatura

Criterion	The initial number of articles	Excluded items	Number after selection
Thematic relevance	940	-335	605
Language relevance	605	-316	289
Timeframe (2020-2024)	289	-246	43
Overall			43

Source: Author's development.

Instruments and procedures

The research process began with collecting expert evaluations through semi-structured interviews. This method allowed respondents to express their perspectives during the interviews. Some questions had predefined answer options, while expert opinions were also analysed through content analysis to identify key themes. The questions addressed various aspects of youth identity formation and self-realisation, including:

1. To what extent do social media platforms influence the personal identity formation of young people in the modern world?
2. What are the key elements of social media's impact on youth identity that can be considered most significant?
3. What contextual factors are most important for understanding the influence of social media on identity?

Additionally, assessments were conducted to evaluate the potential benefits of social platforms for youth self-realisation in different spheres of societal life and the risks and challenges associated with social media interaction. Focus groups were organised among the experts, providing an online forum for discussing the key issues and concepts proposed during the survey. This step-by-step approach facilitated the collection of necessary scientific literature and organising surveys involving students and experts.

Data Analysis

The data analysis utilised Microsoft Excel, which proved to be the most suitable software for data processing due to its versatility and user-friendly interface. Additionally, it allowed for high-quality visualisation, simplifying the handling of information. Core data (author, publication title, year of publication, and findings) were recorded in a dedicated table. This facilitated a practical content analysis of the academic literature, creating a holistic view of youth identity and self-realisation.

Furthermore, another table was compiled detailing each expert's identification number, main statements, and survey results. This enabled a comprehensive summary of the experts' opinions. The obtained results (from student and expert surveys) were subjected to comparative analysis, including comparisons with perspectives presented in the academic literature.

Results and Discussion

Social media has become integral to everyday life (Bartosh, 2022). This is particularly relevant for young people who actively use such digital technologies. Under these circumstances, communication in the digital environment is a significant factor in shaping their identity, aligning with current globalisation processes and trends (Myropoltseva & Amplieieva, 2021). Within this context, and considering the challenges faced by Ukrainian society (such as Russian aggression and the aftermath of COVID-19), it is essential to identify the key aspects of social media's influence on the personal identity formation of young people and assess its potential as a tool for self-realisation (Cheromukhina, 2024). A survey of young people revealed specific trends within this process (see Table 2).

Table 2.

The influence of social networks on the formation of personal identity in young people

No	Questions and answer options	Number of ratings (youth)	Number of ratings (experts)
1.	Assess how much social networks in the modern world influence the formation of the personal identity of young people.		
A	Very noticeable	35 (44%)	18 (40%)
B	Noticeable, but not crucial	25 (31%)	16 (35,5%)
C	Less noticeable	14 (18%)	8 (18%)
D	Imperceptible	6 (7%)	3 (6,5%)
2.	What are the main elements of the influence of social networks on the formation of young people's identity that can be considered the most important?		
A	The ability to present yourself	38 (47%)	16 (35%)
B	The impact of digital content on self-perception and self-esteem	16 (20%)	14 (31%)
C	Finding like-minded people	17 (21%)	10 (22%)
D	Creating a digital footprint, learning	8 (10%)	5 (12%)
3.	What context can be considered most important for understanding the impact of social media on identity?		
A	Social	34 (43%)	15 (33%)
B	Psychological, or worldview	20 (25%)	12 (27%)
C	Cultural	20 (25%)	11 (26%)
D	Economic	6 (7%)	7 (15%)

Source: Author's development.

The results indicated that both young respondents and experts generally agree on social media's impact on forming personal identity among youth. Specifically, both groups concur that this influence is significant or highly significant (75% of young respondents and 75.5% of experts). This suggests a shared understanding of social media's importance in the modern world. The difference between those who do not perceive any impact of social media is also minimal.

At the same time, young respondents emphasise that these technologies enable them to present themselves better (47%). While experts agree with this perspective, their responses are slightly lower, at 35%. Conversely, students believe that an essential aspect of social media's influence on identity formation is the ability to find like-minded individuals (17%). In contrast, experts highlight the importance of digital content's impact on self-perception and self-esteem (31%). Both groups, however, agree that opportunities related to creating a digital footprint and learning are less significant. Students' and experts' opinions are also relatively aligned regarding the context deemed most important for understanding the impact of social media on identity. Both groups prioritise socialisation issues (34% and 33% of respondents, respectively), while psychological and cultural effects receive roughly equal evaluations. The economic aspect ranks lowest in the survey results.

Overall, modern digital technologies provide opportunities for self-realisation across various directions, including different spheres of social life. Researchers argue that engagement with specific social media platforms allows individuals to showcase creative skills and gain valuable experiences from observation. For instance, TikTok offers promising avenues for sharing original video content, while Threads facilitates concise text creation (Ali et al., 2023). In the Ukrainian context, not all such trends may be effective. Furthermore, young people typically utilise only select social media platforms they associate with their

notions of identity and self-realisation (Vovk, 2022). It has also been proposed that the most successful avenues for self-realisation be identified as directly linked to specific social media platforms (see Figure 1).

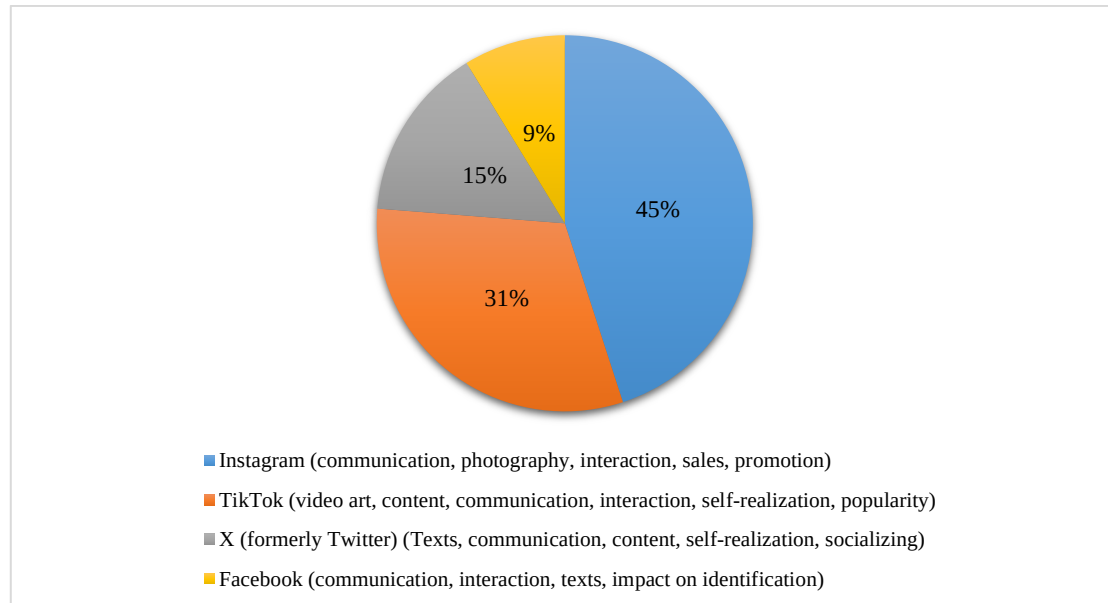


Figure 1. Assessments of the possibility of obtaining benefits from social platforms for the self-realisation of youth in various spheres of public life.

Source: Author's development.

The survey identified TikTok and Instagram as platforms that promote Ukrainian photo and video content. This contributes to identity formation, while popularising certain professions also aids future career decision-making. Engagement with these platforms is noted most frequently, given their high levels of popularity and corresponding influence on young people's consciousness. At the same time, it is worth comparing the survey results with expert opinions to determine how students' perceptions align with specialists' evaluations (see Table 3).

Table 3.

Assessments of the possibility of obtaining benefits from social platforms for the self-realisation of young people in various spheres of public life (expert opinion)

Platform and self-realisation	Number of ratings	Individual opinions of experts
Instagram (communication, photo art, interaction, sales, promotion)	19 (43%)	Expert 2: Instagram's popularity in Ukraine is undisputed. The social platform offers vast opportunities for self-development and for finding the information you need. Expert 28: Instagram is familiar to many young people in Ukraine as a marketplace.
Facebook (communication, interaction, texts, influence on identification)	15 (33%)	Expert 16: Facebook remains a leader in discussing socially significant events, directly affecting young people's self-identification. Expert 32: The opportunities to interact with information and other users on Facebook remain the best, even despite the company's rather strict policy.
TikTok (video art, content, communication, interaction, self-realisation, popularity)	7 (15,5%)	Expert 20: TikTok's capabilities are primarily aimed at the entertainment context, which must be considered when interacting with this social platform.
X (formerly Twitter) (Texts, communication, content, self-realisation, communication)	4 (8,5%)	Expert 43: Using Messenger X to form self-identification is problematic, although it can develop specific text communication skills.

Source: Author's development.

The results of the expert survey differ from those of the young respondents. First and foremost, the social platform Facebook ranks second, whereas young respondents placed fourth. This discrepancy can be explained by changes in the preferences of the younger generation, which the experts have not fully considered. The growing popularity of TikTok is observed globally, as noted in several contemporary studies (Jia, 2024; Steinert & Dennis, 2022). On the other hand, experts do not dispute the associations that young people form while engaging with social media platforms. The survey does not contradict the belief among young people in the significant potential of the listed social networks for identity development and various forms of professional and creative self-development. The main tags associated with social media include communication, interaction, texts, content, art, self-realisation, and socialising. Considering these tags will help trace the evolution of social networks as part of the digital environment and their impact on the self-reflection of young people.

At the same time, using social media has risks, affecting self-identification and educational and cultural development. The survey, which revealed specific results (see Figure 2), made the identification of such risks possible.

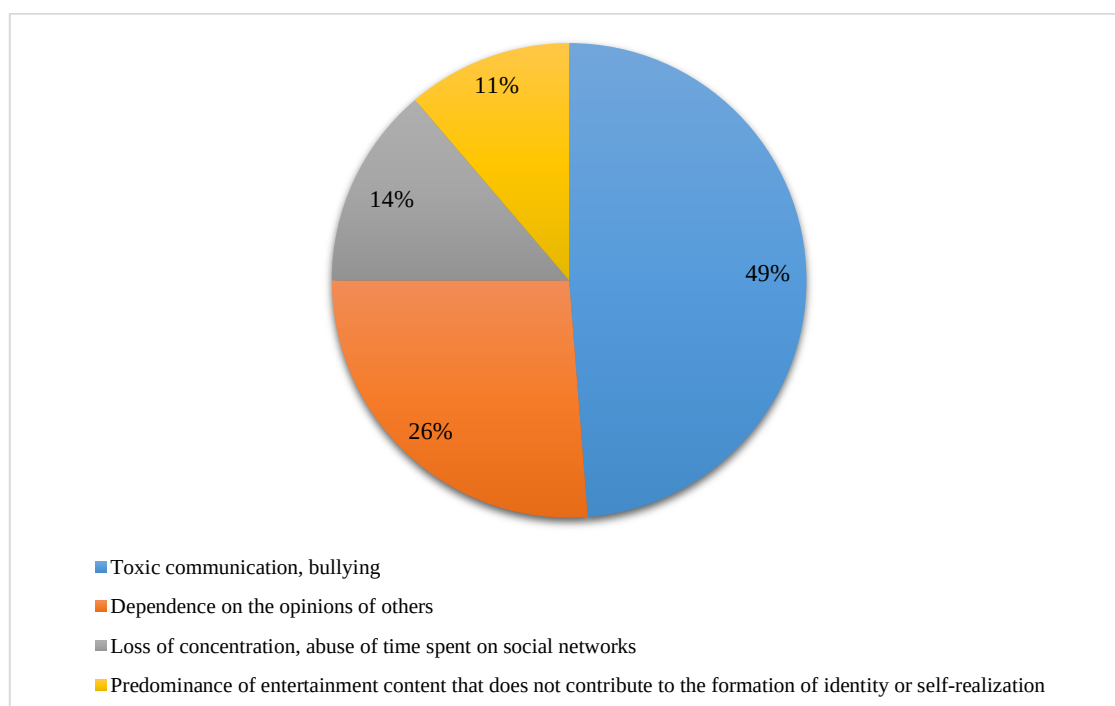


Figure 2. Risks and obstacles when interacting with social networks.

Source: Author's development.

Young people consider the most significant risks associated with interacting with social media to be bullying, the development of a need for positive feedback from others, "digital burnout," which reduces overall productivity when working with gadgets, the predominance of entertainment content that replaces opportunities for self-improvement, creative work, and so on. Psychologists argue that, in general, dependency on the opinions of others is a significant issue for contemporary young people, who are trying to conform to trends, fashion, and current behavioural norms (Sobchenko et al., 2022). Adhering to such ideals may replace the positive aspects of communication, exchange of experiences, etc. However, only positive elements in the modern digital environment are probably impossible (Camara et al., 2023; Mudrak et al., 2019). Experts suggested that the results of the student survey be evaluated. The responses have been summarised in a separate table, with additional comments that allow for an overall assessment of the specialists' perspectives (see Table 4).

Table 4.
Risks and obstacles when interacting with social networks (expert assessment)

Risks	Number of ratings	Individual opinions of experts
Toxic communication, bullying	15 (33%)	Expert 10: Bullying is one of the most common problems in modern digital communication.
		Expert 12: Communication skills in modern digital communication are mandatory for every young person. Such skills must be introduced into the educational process to avoid undesirable situations.
		Expert 21: Security challenges are highly relevant since the digital environment of social networks is now also an active field where scammers, people with toxic influence, etc., operate. These aspects must be taken into account when working on social networks.
Dependence on the opinions of others	12 (28%)	Expert 8: Communication on social networks sometimes requires resilience because imposing opinions harms creative self-expression and self-realisation.
		Expert 31: Propaganda is a tangible challenge of our time. Russian aggression against Ukraine has demonstrated how digital channels can be used to spread lies.
		Expert 33: Often, the image of the professional future imposed on students by social networks does not correspond to reality.
Loss of concentration, overuse of time spent on social media	10 (22%)	Expert 27: Digital burnout leads to loss of concentration, time waste, and inefficient use of technology.
Predominance of entertainment content that does not contribute to identity formation or self-realisation	8 (17%)	Expert 4: Modern social networks (including TikTok and Instagram) are oversaturated with entertainment content (including low-quality content) that does not stimulate cognitive activity.
		Expert 26: Viewing large amounts of entertainment information creates obstacles to self-realisation, for which time may not be enough.

Source: Author's development.

Experts generally reached similar conclusions to those of the surveyed students. The findings confirmed the primary concerns of students, with specialists ranking threats in the same order. Some perspectives highlight the need to develop communication competencies (to prevent bullying), adhere to safety rules (such as sharing only the minimum necessary information), build psychological resilience, counteract burnout (caused by excessive gadget use), and acquire skills to interact appropriately with digital content without losing motivation for self-fulfilment. Additionally, it is worth noting that the aggressive dissemination of propaganda poses challenges to forming Ukrainian identity. However, the growing popularity of Ukrainian content (even entertainment-focused) on modern social media points to emerging trends significantly more favourable to Ukrainian identity, introducing young people to national culture, art, and history.

Social media has become an essential element of everyday life for young people in the modern world. Under such circumstances, communication in the digital environment, with its specific characteristics, plays a crucial role in shaping their identity. The study aimed to investigate social media's impact on young people's identity formation and explore their potential as a tool for self-realisation. The research sought to address several relevant questions, including the influence of social media on the processes of personal identity formation among young people, the existing assessments of the benefits provided by social platforms for self-realisation in various spheres of societal life (including professional domains), and the identification of the main challenges, risks, and obstacles encountered during direct interaction between young people and social media.

The results of the study indicate that young respondents and experts alike consider the influence of social media on the identity formation of young people to be profound. This finding supports the conclusions of other researchers who regard social media as one of the modern tools for exploring one's future (Roberti, 2022; Setia et al., 2024). Simultaneously, young people emphasise that these technologies allow them to present themselves better and find like-minded individuals. Experts highlight the importance of social media in shaping young people's perceptions of themselves and their corresponding self-esteem. This divergence in evaluations has become a topic of academic debate. Some researchers argue that such differing perspectives are typical of young individuals who have yet to fully appreciate the importance of developing healthy self-esteem for achieving their ambitions (Jakaza, 2022). On the other hand,

professional self-identification, which is critically important for young people, appears to be overlooked (Capstick et al., 2019). In this context, social media can be particularly hazardous, as it may create misleading perceptions of the professional world, potentially causing distress among young people with unrealistic expectations fostered by social media.

In turn, one of the productive approaches that allow young people to form an idea of self-identification and ways of professional self-realisation is coaching, which is used in the higher education system. Such coaching not only creates a space for maximum self-realisation of student youth but also stimulates self-education so that students can later find and acquire the necessary knowledge independently – this helps them learn to learn (Zelenin, 2024), in particular in the context of social networks (Ponomarenko & Zelenin, 2022). Researchers note that one of the key tasks of academic coaching (Garvey & Stokes, 2022), to be undertaken by university educators, is to correct misconceptions about professional futures and foster realistic (and adequate) perceptions and strategies for professional self-realisation (Jarrar et al., 2022; Zelenin & Antoniuk, 2022). The lack of attention to students' professional futures is partially evidenced by the fact that the economic context of social media's influence on identity ranked last in the study's findings.

The proposed findings highlight that social platforms such as TikTok and Instagram are identified as practical tools for promoting Ukrainian photographic and video content. This activity contributes to identity formation while popularising certain professions, aiding future career determination. Engagement with these social platforms is most frequently noted due to their significant levels of popularity and corresponding influence on the consciousness of young people. Experts have prioritised Facebook in terms of importance. This situation can be explained by the dynamic changes in the preferences of the younger generation, which are less evident within Ukrainian expert circles. However, these results align with the perspectives of European researchers, who observe emerging trends in the interests of young people, including their engagement with social networks (Cano-Marin et al., 2023; Du, 2024; Subiyanto, 2021). Respondents emphasised that their primary interests are communication, interaction, texts, content, art, self-realisation, and socialisation. Such findings corroborate the views of other scholars and validate their conclusions (Quiroga-Sánchez et al., 2022). The identified markers point to the deep integration of social networks into everyday life, particularly in self-realisation.

The proposed results also indicate that young people perceive significant risks associated with social media interaction, such as bullying, the development of a dependence on positive evaluation from others, "digital burnout," which reduces productivity when using gadgets, and the predominance of entertainment content that can overshadow opportunities for personal development and creativity. Empirical measurements conducted by other researchers demonstrate similar trends (Hoffner & Bond, 2022). Furthermore, Ukrainian experts share analogous opinions and propose strategies to counter these risks. These include developing communication competencies to avoid bullying, adhering to safety guidelines, becoming more resilient to stress, countering burnout, and prioritising effectively. The proposed findings could be further developed through comparative studies with other academic research. Specifically, researchers have formulated a set of recommendations for optimising the influence of social networks on the identity of young people (Bonsaksen et al., 2023). Foremost among these is the active implementation of informational campaigns to foster critical thinking and acquire digital literacy and communication skills (Campanella, 2022). Ensuring psychological support for young people who become dependent on social networks or struggle with their use is also crucial (Shayner et al., 2024). Continuing this policy could involve incorporating specialised educational courses to promote digital ethics and safety (Yefimova, 2024). These perspectives complement the survey findings, which generally confirm the substantial impact of social networks on the identity formation of young people. The obtained results introduce new insights into the processes of youth identity formation, particularly in creative, professional, and cultural contexts, and raise questions about further interdisciplinary research into the integration of educational practices to support young people in utilising social networks and other digital tools for self-realisation in the modern world.

Hence, the results of this study have significant theoretical and practical implications. In particular, the findings of this study have contributed to the formation of an essential framework for the analysis of identity development in the digital age, particularly in the Ukrainian context during the war. By analysing the views of experts, the study has strengthened existing theories of social identity and digital influence. In addition, the study has also expanded discussions on the theory of the media effect and highlighted the role of social media as a reinforcing and destructive force in identity formation.

From a practical perspective, the results have offered essential information for stakeholders involved in youth development and media literacy programs. Youth engagement programs can adapt some of the described interventions, such as mentoring programs that connect young people with cultural and historical narratives.

The methodology proposed in this study has limitations, which should be considered in future work with the survey results. Specifically, it is essential to recognise that the interview method relies on the subjective experiences of respondents. As a result, one respondent may evaluate positively, and another may describe more cautiously. The conducted survey is no exception to this rule, so this aspect should be considered when using the results. However, the survey reflects the general direction of respondents' opinions, meaning there are no radical discrepancies between assessments, only minor adjustments that merit attention. The survey, however, was conducted during a period of military conflict, which may have caused some respondents to feel the pressure of external circumstances, potentially influencing their evaluations. This aspect also requires consideration, yet such surveys are valuable examples of how respondents living in extreme conditions perceive issues of self-realisation, communication, and professional self-determination. The comparison was based on the content analysis method of scientific literature. For this purpose, the most relevant works published in English over the past six years were selected. This approach is logical, as it focuses on peer-reviewed publications; however, there is a possibility that certain scholars' perspectives were not included due to language barriers. While this does not diminish the value of the survey's findings, it opens opportunities for further research, particularly in expanding the academic foundation for comparisons with new scientific sources.

Conclusions

Thus, contemporary social media platforms play a significant role in shaping young people's identity and serve as a tool for self-realisation, as highlighted by the surveyed students and specialists. It has established social platforms with opportunities to promote Ukrainian visual and video content. This contributes to identity formation, while the popularisation of certain professions further aids young people in shaping their professional futures. Experts, on the other hand, traditionally favour using Facebook as a reliable tool for identity formation and exploring opportunities for self-realisation. Experts acknowledge that the primary tags associated with social media include communication, interaction, texts, content, art, self-realisation, and social engagement.

The most significant risks identified are bullying, developing a dependency on positive evaluation from others, "digital burnout," and an overemphasis on entertainment content. Experts generally agreed with these findings during the survey. To resist these negative phenomena, it is recommended that academic coaching approaches be introduced into the education of young people as a means of forming an identity and a correct vision of the prospects for professional self-realisation. These approaches should also develop students' communication skills, adherence to safety protocols, increased resilience, combat burnout, proper interaction with digital content, and effective determination of life priorities. Notably, the growing presence and popularity of Ukrainian content (even entertainment-focused) on modern social media platforms indicate emerging trends that are increasingly favourable to Ukrainian identity.

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