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BOOK OF ABSTRACTS

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Chapter 1

ROAD2EU, Academic Synergy, and Responsible Digital Transformation

Roadmap for Embedding EU Economic, Social, and Territorial Synergy into Polish Higher Education Through Digital European Studies

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This paper presents the ROAD2EU Jean Monnet Module "Roadmap for Integrating EU Policies and Strategies on Economic, Social, and Territorial Synergy in Polish Higher Education through Digital European Studies" (Grant Agreement No. 101235886 – ROAD2EU – ERASMUS-JMO-2025-HEI-TCH-RSCH), co-funded by the European Union and managed by the European Education and Culture Executive Agency (EACEA) (hereinafter as ROAD2EU), as a structured academic roadmap for embedding European Union economic, social, and territorial priorities into Polish higher education through Digital European Studies. It argues that Digital European Studies can function as an integrative framework linking EU digital transformation, social inclusion, territorial cohesion, and innovation-oriented academic practice. Particular attention is paid to the three core synergy dimensions of ROAD2EU and to the methodological instruments through which they can be translated into teaching, research, and outreach activities: policy mapping, digital literacy, case-based teaching, comparative analysis, and evidence-based assessment. The presentation also discusses how higher education institutions may connect EU policy knowledge with regional development needs, research ecosystems, and public-sector cooperation. In this way, ROAD2EU is framed not merely as a teaching module but as a practical model for strengthening resilient, policy-aware, and digitally competent higher education ecosystems in Poland.

Keywords: *ROAD2EU, Digital European Studies, Higher Education, EU Policy Integration, Economic Synergy, Social Synergy, Territorial Synergy*

Social Synergy Perspective of Digital Transformation of Education Ecosystems: Ethical and Human-Centred AI

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Artificial Intelligence (AI) is rapidly reshaping formal and informal education systems and, more broadly, the foundations of digital society. AI tools influence not only pedagogical practices but also core societal values. In this context, the digital transformation of education ecosystems emerges as a critical domain for advancing socially responsible and human-

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centred innovation in Europe. Digital technologies enable personalised and adaptive learning pathways, support the creation of digital educational content, and enhance educators' practices, thereby contributing to improved quality, inclusiveness, and efficiency in education (Al-Emran et al., 2024). Despite its potential, the integration of AI in education poses complex, context-sensitive, and ethical challenges. A key challenge identified at the European level is that many AI tools are developed with limited involvement from core educational stakeholders, such as learners, teachers, school leaders, and policymakers. Without systemic change, there is a risk that AI contributes to digital overload and inefficiency, rather than improving learners' academic, social, and emotional outcomes. A significant gap also exists in individual and institutional competencies for the ethical and inclusive integration of digital technologies in education ecosystems and wider society. High-level frameworks (for instance, the Ethical Guidelines on AI in education, EU, 2022) provide important theoretical foundations for digital transformation in education, but their practical implementation has not yet been achieved, even across EU Member States. Anyway, existing initiatives demonstrate the potential for ethical and human-centred AI in education. This highlights the urgent need for structured, transnational collaboration and public–private partnerships (PPPs) that bring together education, research, industry, and policy actors to co-design and develop EU value-based AI solutions. These ecosystems will improve the quality, inclusiveness, and effectiveness of education by enabling the human-centred, ethical, transparent, and pedagogically driven integration of AI technologies, in line with European values and regulatory frameworks, including the Artificial Intelligence Act (2024).

Keywords: *Artificial Intelligence in Education, Digital Society, Ethical AI, Human-Centred AI, Education Ecosystems, Digital Transformation, Public–Private Partnerships*

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Assessment of Mental Health-Related Productivity Losses Among Companies' Workforces

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Human capital is one of the strategic resources of an enterprise that impacts its innovative potential and competitiveness. Human capital, represented by the enterprise's personnel, is the stock of knowledge, soft skills, competencies, experience, abilities, motivations, and other productive characteristics accumulated by an employee, which are used in their professional activities and contribute to increased work productivity and, as a result, increase the income of the individual and the profits of the enterprise. In a post-industrial economy, investment in human capital yields a 5-6 times higher return than investment in traditional tangible assets.

Good psycho-emotional health and mental well-being are key to maintaining human capital. According to the World Health Organisation, mental health is not merely the absence of mental disorders, but also implies a state of psychological well-being in which an individual is able to fully utilise their knowledge and abilities, cope with the normal stresses of life, work productively and contribute to the life of their family and community.

Unfortunately, increased intensity of work, excessive workloads, many tasks, constant deadlines, working at a stressful pace, the desire to do everything perfectly, and an imbalance between work and life lead to mental and physical exhaustion, which in turn results in mental health problems and related work productivity losses.

Furthermore, in times of war, the above-mentioned problems are exacerbated even further, as existing functional impairments are compounded by the extremely powerful impact of war-related stressors, including war trauma, traumatic experiences, irregular sleep patterns, the loss of homes and family separation, and constant air raid alerts.

The underlying mechanism of the impact of mental health problems on employees' work productivity is impaired cognitive skills, including attention, visual processing, sensory integration, and memory, resulting from symptoms of depression, PTSD, sleep disorders, anxiety disorders and substance use disorders. As a result of a decline in the overall efficiency of the cognitive system, an employee may lose the ability to work productively, ultimately leading to absenteeism or presenteeism.

The methodology for assessing mental health-related work productivity losses involves analysing the economic losses associated with absenteeism, sick leave, and presenteeism. To assess work productivity losses caused by absenteeism and sick leave, the number of days an employee was absent from the workplace can be multiplied by the average daily productivity of the enterprise's staff. In turn, assessing work productivity losses caused by presenteeism is usually a more complex task that involves specialised questionnaires, such as the "Work Productivity and Activity Impairment Questionnaire" (WPAI).

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The data obtained through the above-mentioned methods, which clearly demonstrate the extent of the negative impact of mental health problems on work productivity, can serve as a reliable empirical basis for developing and implementing a comprehensive enterprise-level strategy. It could serve employees' interests by enabling the identification of mental health problems and providing support to those suffering from mental health conditions, whilst promoting their inclusion in the workforce and maintaining their workplace productivity.

***Keywords**: Human Capital, Mental Health, Work Productivity, Absenteeism, Presenteeism, Cognitive Impairment, Workforce Well-Being, WPAI*

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From EU Economic Priorities to Higher Education Practice: Digital Transformation, Green Growth, and Regional Competitiveness in the ROAD2EU Framework

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This presentation examines how the ROAD2EU Jean Monnet Module "Roadmap for Integrating EU Policies and Strategies on Economic, Social, and Territorial Synergy in Polish Higher Education through Digital European Studies" (Grant Agreement No. 101235886 – ROAD2EU – ERASMUS-JMO-2025-HEI-TCH-RSCH), co-funded by the European Union and managed by the European Education and Culture Executive Agency (EACEA) (hereinafter as ROAD2EU), translates European Union economic priorities into higher education practice through the combined lenses of digital transformation, green transition, and regional competitiveness. It argues that Polish higher education institutions should not only teach EU economic strategies as policy content, but also operationalise them through innovation-oriented curricula, digital tools, and cross-sector cooperation. Drawing on the logic of Digital European Studies, the paper highlights the role of universities in connecting economic modernisation, smart regional development, and socially responsible growth. Particular attention is given to digital skills, regional innovation ecosystems, and the role of academic institutions in preparing students to interpret and apply EU priorities in changing economic

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environments. Within the ROAD2EU framework, the presentation proposes a practical model for embedding EU economic and territorial priorities into teaching, student projects, and university-based cooperation with broader research and public ecosystems.

Keywords: *Digital Transformation, Green Growth, Regional Competitiveness, Higher Education, Innovation Ecosystems, Digital European Studies, ROAD2EU*

Academic Synergy as a Mechanism of European Integration: A Case Study of Strategic Cooperation between Sumy State Pedagogical University and VIZJA University

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In the context of the ongoing transformation of the European educational area, interinstitutional cooperation has become an important mechanism for aligning national higher education systems with European academic, research, and policy frameworks. This paper examines the strategic partnership between Sumy State Pedagogical University named after A. S. Makarenko (Sumy, Ukraine) and VIZJA University (Warsaw, Poland) as a case study of academic synergy in support of European integration. The analysis focuses on selected Erasmus+ and Jean Monnet initiatives, including ESPERIDTA, ROAD2EU, ARRDE, and VISUAL-EU, and considers how project-based cooperation contributes to curriculum modernisation, academic mobility, interdisciplinary research, and the integration of digital and European studies into teacher education. Particular attention is paid to four interrelated dimensions of cooperation: the incorporation of EU policy perspectives into teaching and learning; the development of digital competences and AI-related pedagogical practices; the expansion of joint research and publication activity; and the strengthening of international academic networking. The paper argues that academic synergy should be understood not simply as institutional collaboration, but as a structured mechanism for transferring European educational priorities into local academic practice. The case demonstrates that sustained cross-border cooperation can support the Europeanisation of pedagogical education, foster innovation in teaching and research, and enhance the resilience and international visibility of higher education institutions amid digital and geopolitical change.

Keywords: *European integration, academic synergy, interinstitutional cooperation, digital transformation of education, academic mobility, Jean Monnet, higher education*.

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Algorithmic Legitimacy and the Digital State: Rethinking Governance, Trust, and Accountability in the Age of AI

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This paper examines how the expansion of AI-assisted decision-making is reshaping the legitimacy of public institutions in Europe, with particular attention to Polish higher education and research governance. It argues that, in the context of the digital state, legitimacy can no longer be reduced to formal legality, administrative efficiency, or technological performance alone. Rather, algorithmic governance is legitimate only when public authority exercised through data-driven systems remains transparent, explainable, contestable, and institutionally accountable.

Bringing together normative political theory, legal analysis, and governance studies, the paper develops a four-dimensional framework of algorithmic legitimacy: procedural transparency, traceable responsibility, rights-based safeguards, and meaningful human oversight. It also examines how opaque automation may erode trust in public institutions by weakening due process, diffusing responsibility, enabling problematic data practices, and depersonalising administrative judgment.

The analysis is situated within broader European debates on digital transformation, democratic accountability, and responsible AI, while also highlighting the specific pressures faced by Polish universities and public research institutions. In this setting, the drive to modernise governance, enhance competitiveness, and expand data-driven management must be balanced against academic freedom, social trust, and legal and ethical standards. The paper concludes that AI should not be approached merely as an instrument of optimisation, but also as a political and moral challenge requiring carefully designed institutional safeguards, robust review procedures, and effective avenues of redress. In this way, the study contributes to Digital European Studies by linking theories of legitimacy with practical conditions for the responsible use of AI in education and public administration.

Keywords: Algorithmic Legitimacy, Digital State, AI Governance, Democratic Accountability, Public Trust, Higher Education Governance, Digital European Studies

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Responsible AI in Public Administration Under the EU AI Act

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The entry into force of Regulation (EU) 2024/1689 (the Artificial Intelligence Act) marks a paradigm shift in the European Union's approach to algorithmic regulation, carrying particularly far-reaching consequences for public administration. This study undertakes an analysis of the legal framework for the responsible deployment of artificial intelligence systems by public administration authorities in the light of the Artificial Intelligence Act, situating it within the broader European Union constitutional architecture for the protection of fundamental rights. The analysis focuses on three interconnected dimensions. It identifies the categories of AI systems used in public services that are classified as "high-risk" under Annex III of the Act – including systems used in education and in access to essential public services – and discusses the corresponding obligations imposed on entities deploying them in the public sector. An assessment of the impact on fundamental rights is carried out. An attempt is also made to evaluate the interaction between the AI Act and the most recent case law on automated decision-making, which has significantly strengthened transparency obligations. It is argued that although the AI Act establishes an unprecedented legal architecture for responsible AI in public administration, its effectiveness will depend on resolving definitional ambiguities, operationalising the FRIA, and national authorities' willingness to ensure genuine enforcement.

Keywords: *Artificial Intelligence, AI Act, Public Administration, Fundamental Rights, Fundamental Rights Impact Assessment, European Union Law*

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Economic Synergy I: Data, ESG, and Innovation Governance

Aspects of Optimisation of Managerial Decision-Making Through the Implementation of Interactive Dashboards

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At the current stage of economic development, large-scale digital transformation is reshaping approaches to managerial decision-making. The need to process large volumes of data drives the adoption of Data-Driven Management. A key element of this paradigm is the use of interactive visualisation tools – dashboards – that integrate financial, marketing, operational, and strategic KPIs to identify hidden patterns and ensure transparency in business processes in a volatile environment. According to Gartner, three products dominate the dashboard market: MS Excel remains a baseline tool for rapid financial calculations and ad-hoc analysis, yet demonstrates significant limitations in Big Data processing and real-time interactivity; Microsoft Power BI enables enterprise-level business intelligence through DAX-based data processing and automated real-time reporting; Tableau offers advanced visual analytics and flexibility for heterogeneous data exploration, though it requires considerable time to master. The contemporary IT market also offers specialised solutions: Looker Studio for cloud-based marketing analytics; Grafana for time-series visualisation; Apache Superset for large-scale on-premises data processing; Streamlit for AI-integrated management dashboards built with Python. Among the reviewed platforms, Power BI offers the most balanced price-to-functionality ratio. Unlike static Excel spreadsheets, it enables managers to identify the root causes of KPI deterioration in real time through drill-down capabilities – a capability that is fundamental to organisational resilience under market uncertainty. Thus, implementing interactive dashboards is a strategic imperative for modern enterprises, directly enhancing the speed, accuracy, and transparency of managerial decision-making. It should also be noted that integrating data visualisation systems (dashboards) into higher education enables institutions to go beyond formal statistical collection, facilitating in-depth analysis of individual learning trajectories, real-time monitoring of student academic performance, and evaluation of research effectiveness.

Keywords: *Managerial Decision, Dashboard, Analytics, Visualisation, Business Intelligence, Data-Driven Management*

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Data-Driven and Intelligent Management of Innovation Ecosystems: Implementing EU Digital and ESG Frameworks in Ukraine

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The transformation of economic governance within the European Union is increasingly shaped by the Digital Single Market strategy, which aims to enhance competitiveness through data integration, the diffusion of innovation, and the removal of digital barriers. Under these conditions, innovation ecosystem management evolves toward data-driven, intelligent models, in which decision-making is grounded in real-time analytics, key performance indicators, and digital dashboards. Intelligent management extends beyond digitalisation by incorporating advanced analytical capabilities, predictive modelling, and adaptive decision-making mechanisms. The application of Big Data technologies enables the identification of hidden patterns, optimisation of resource allocation, and increased transparency in governance processes. Such an approach ensures a shift from reactive to proactive and evidence-based economic management. The development of innovation ecosystems based on the "university–business–government" model requires alignment with EU competence frameworks. DigComp defines the essential digital competencies required for effective participation in the digital economy, including data literacy, problem-solving, and cybersecurity. Simultaneously, EU sustainability strategies, especially the European Green Deal, integrate ESG principles into economic governance, emphasising decarbonization, resource efficiency, and sustainable finance. The convergence of digital and green transitions forms a new paradigm for smart economy development, in which innovation ecosystems operate as integrated, adaptive, and sustainability-oriented systems. Within the INNO-RISE UA framework, the implementation of EU digital and ESG doctrines facilitates the formation of institutionally resilient economic structures in Ukraine. Adoption of intelligent and data-driven management approaches enhances strategic coherence, strengthens cross-sectoral collaboration, and supports integration into the European Research and Digital Spaces. Methodologically, this approach enables the formalisation of performance indicators, synchronisation of stakeholder interests, and scaling of innovation outputs. Consequently, innovation ecosystems become key drivers of sustainable economic growth, ensuring long-term competitiveness and alignment with EU development trajectories.

Keywords: *Data-Driven Governance, Intelligent Management, Digital Single Market, ESG, Innovation Ecosystems, Smart Economy*

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Data-Driven Corporate Governance and ESG Integration for Sustainable Growth

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Data-driven corporate governance relies on analytics, statistics, and established standards and policies to support informed decision-making for sustainable company growth. This approach shifts from reactive business management to a proactive model, encouraging growth through innovation, resource optimisation, and adherence to ESG practices. The scope of ESG metrics includes greenhouse gas emissions, energy use, water consumption and discharge, pollution of air, water, and soil, compliance with human rights (such as workplace safety and lost-time incidents), employee training and development, customer satisfaction, fair labour practices, and the adoption of transparent governance structures. Dynamic market conditions, modern challenges, and rising competition drive businesses to quickly adapt to shifting market demands. Companies that partner with the EU are already subject to reporting requirements under the Corporate Sustainability Reporting Directive (CSRD), which encourages practical ESG implementation. Businesses that act swiftly gain sustainable competitive advantages in markets, access to capital, and international partnerships, while delays can weaken their competitiveness. Implementing various business development initiatives aims to create measurable economic, environmental, social, and managerial results, enhancing companies' resilience and competitive advantage through strategic growth. Reports should include not only general ESG practices but also specific, measurable indicators of corporate impact on ecological, social, and governance aspects. Furthermore, companies are increasingly expected to disclose risks related to climate change, human rights, and corporate governance that could negatively impact operations to facilitate effective risk management. Integrating ESG principles into corporate strategy has become essential for achieving long-term sustainable growth and staying competitive in both domestic and international markets.

Keywords: *Data-Driven Corporate Governance, ESG Metrics, Dynamic Market Conditions, Risks*

The Impact of ESG Effects on Business Value Creation in the Context of a Strategic Orientation Towards Sustainable Development

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This study explores the impact of Environmental, Social, and Governance (ESG) factors on business value creation within a strategic orientation toward sustainable development. The research identifies key ESG effects that contribute to both financial performance and long-

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term organisational sustainability. The findings indicate that ESG integration enhances brand reputation by strengthening stakeholder trust and loyalty and improving the attraction and retention of qualified employees. ESG practices contribute to operational efficiency, resulting in improved financial indicators, cost reduction, and revenue growth through access to new markets and increased customer confidence. Furthermore, ESG-oriented companies gain improved access to capital by attracting ethical investors and benefiting from expanded investment opportunities. The study also highlights that ESG fosters innovation and provides a sustainable competitive advantage. Enhanced transparency and accountability improve stakeholder relationships, while ESG reporting supports better corporate governance. In addition, ESG contributes to effective risk management by enabling companies to identify and mitigate environmental, social, and operational risks. Overall, the results demonstrate that ESG is a strategic driver of value creation, allowing companies to achieve financial success while promoting positive social and environmental impact. Integrating ESG into business strategy ensures long-term resilience, competitiveness, and sustainable growth.

Keywords: *ESG Factors, Enterprise Performance, Added Business Value, Sustainable Development, Financial Performance, Investment Attractiveness*

Contribution of Intangible Assets to the Innovative Potential of Enterprises

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In modern knowledge-based economies, intangible assets form the foundation of scientific and technological progress and are a key driver of innovation-based enterprise development. The integration of intellectual property and other types of intangible assets into economic activity ensures market success for both individual companies and the economy. The experience of developed economies convincingly demonstrates that the predominance of intangible components in the asset structure plays a key role in strengthening companies' innovative potential and competitive advantages in the global economic environment.

An intangible asset is an identifiable, separable non-monetary asset without physical substance that is used in the company's operations and generates future economic benefits, including revenue from the sale of goods or services, cost savings, etc. As part of the broader concept of intellectual capital, intangible assets ensure a company's competitive position in the modern marketplace; they exist as a dynamic system that develops around a specific business objective and, at the same time, serve as tools through which this objective can be effectively achieved.

Intangible assets provide long-term value to a business and can be divided into the following groups: intellectual property (patents, copyrights, trademarks, trade secrets, trade names, and franchises); licenses and permits (import quotas, fishing licences, import licences, and

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radio/television station licences, etc.). Additionally, they can be grouped into internally generated assets (such as proprietary software and in-house-developed patents) and separately acquired assets (such as purchased trademarks, licenses, and patents).

The application of intangible assets in business operations enables enterprises to modernise their production processes, as well as to generate economic profit by creating and marketing innovative products with new consumer characteristics and a high share of added value, which meet market demands and can satisfy new consumer needs, thereby giving companies additional advantages over their competitors in today's globalised product markets.

Active investment in intangible assets demonstrates companies' high innovative potential, enhances their business reputation, and helps position enterprises within the economic environment as innovation leaders and manufacturers of high-tech products, standing at the forefront of scientific and technological progress, and offering goods and services that meet the highest quality standards and the latest consumer demands. Growing trust among business partners and consumers in innovative companies enables them to increase sales volumes with lower costs for marketing support and product promotion; expand customer loyalty; improve return on assets and overall operational efficiency; and strengthen their competitive position in the market. Furthermore, increased innovation activity among enterprises and a rise in the share of intangible assets are usually accompanied by higher stock prices and a corresponding increase in market capitalisation.

Therefore, investment in intangible assets and an increase in their share allow the company to implement innovations at every stage of the value chain, increasing margins through the production and sale of products with a high share of added value at a premium price, which is determined by the product's unique set of characteristics and its ability to meet new consumer needs. Various elements of intangible assets contribute to the generation of added value at every stage of the business cycle involved in creating innovative products, making them a strategic asset for modern enterprises.

***Keywords**: Intangible Assets, Innovative Potential, Intellectual Capital, Enterprise Competitiveness, Intellectual Property, Added Value, Innovation-Based Development*

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Integrating EU Digital Strategies into Public Management: A Roadmap for Innovation and Leadership in Poland

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This paper addresses the challenges and strategic opportunities of embedding European Union digital policies within the Polish public management and higher education ecosystems. As digital transformation becomes a cornerstone of the Digital Single Market, there is an urgent need for "digital leadership"–defined as the capacity to align public strategy with data-driven governance and organisational culture. The study proposes a comprehensive roadmap for implementing innovation through "policy labs," predictive analytics, and regulatory sandboxes. Special emphasis is placed on adopting Agile methodologies in public administration to enhance transparency and responsiveness to citizens' needs. By analysing the "4-pillar model" of change management–focusing on people, processes, technology, and communication–the research identifies actionable approaches to overcome institutional resistance and tool fragmentation. Furthermore, the paper explores the role of platformisation in decision-making processes, utilising "once-only" data principles and evidence-based policy dashboards. Through a comparative analysis of leading EU digital economies, such as Estonia and Denmark, this work provides a set of scalable KPIs and best practices for procurement and interoperability. The findings offer a strategic framework for Polish educators, policymakers, and civil servants to foster a resilient, data-literate innovation ecosystem that aligns with EU territorial and economic synergy goals.

Keywords: *Digital Leadership, Public Innovation, EU Digital Strategy, Agile Government, Data-Driven Governance*

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Methodological Innovations in Digital European Studies

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Modern European integration is inextricably linked with digital transformation. Policy-making processes in the European Union have shifted into digital spaces, creating a new reality for academic research. Traditional paradigms of European studies, which were based primarily on the analysis of legal acts, political institutions, and historical cases, prove insufficient for describing the complex nature of the EU's "digital sovereignty." This necessitates the identification and methodological formalisation of the discipline of "Digital European Studies" as an interdisciplinary field combining political science, economics, law, and the digital humanities. A key challenge for the contemporary academic community is "digital methodological lag." The pace of technological development–the implementation of artificial intelligence, algorithmic regulation, and the scale of Big Data–significantly outpaces the ability of scholars to adapt their toolkit. Researchers often face the challenge of applying quantitative data analysis methods without losing the depth of the humanistic context, which remains the foundation of European studies. The effectiveness of modern research on political processes in the European Union depends directly on mastering the latest methodological toolkit. This includes using Big Data analytics to track public opinion dynamics in real-time via social media, which is critical for understanding public perception of European initiatives. At the same time, network analysis offers opportunities to map complex interest groups and investigate inter-institutional cooperation, enabling an objective assessment of the real influence of individual stakeholders on the legislative process. Furthermore, algorithmic modelling facilitates the forecasting of the long-term consequences of new directives, helping to better understand dynamic processes in rapidly changing digital ecosystems. A separate, critically important aspect is data ethics. Research utilising information from closed platforms or social networks carries risks of privacy violations and manipulation. Transparency in the research process and compliance with GDPR standards have become not just legal requirements but also a scientific value, without which trust in research results is impossible. We propose a transition to a "hybrid methodology." It is based on the synthesis of qualitative political science methods (discourse analysis, expert interviews) and quantitative data analysis tools. This approach allows for the verification of "digital signals" through traditional institutional frameworks. Thus, the future of European studies depends on the academic community's capacity for interdisciplinary convergence. There is a need to develop a "roadmap" for integrating digital competencies (coding, data analysis, digital ethics) into European studies curricula. Only by combining classical humanistic erudition with modern

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technological tools can researchers adequately interpret the complex evolution of EU institutions in the digital age.

Keywords: *Digital European Studies, Research Methodology, Digital Transformation, Big Data, European Integration, Digital Ethics*

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Methodological Foundations of Digital European Studies: An Interdisciplinary Approach

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The ongoing digital transformation in Europe necessitates a reconsideration of approaches to integrating education and technology. This paper aims to clarify the methodological foundations of Digital European Studies by focusing on the role of digital competence development and data literacy as key analytical tools.

The methodological framework of the study is based on a combination of competence-based and analytical approaches. In the educational dimension, emphasis is placed on task-based assessment of digital skills, which enables a more objective evaluation of applied competencies compared with self-assessment practices. This approach supports more consistent pedagogical reflection and aligns with current trends in digital education.

In the analytical dimension, the study focuses on data literacy as a prerequisite for engaging with European policy analysis. The paper highlights the selective and context-dependent use of quantitative approaches, such as regression-based analysis and comparative designs, to examine policy outcomes. Particular attention is given to the ethical use of data, including transparency and reproducibility in research practices.

The regulatory context of the European Union, especially the emerging framework of AI governance, is considered an essential component shaping methodological choices. Compliance with principles such as risk awareness, accountability, and data protection is treated not as an external constraint but as an integral part of the research design.

The paper argues that the methodological coherence of Digital European Studies lies in the balanced integration of competence-based education, analytically grounded research

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practices, and adherence to EU regulatory standards. Such an approach contributes to a more robust and context-sensitive understanding of Europe's digital transformation.

Keywords: *Digital Pedagogy, Policy Evaluation, Data Literacy, EU AI Act, Responsible AI*

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Digital Modelling and Educational Frameworks for Implementing the 1991 EU Nitrates Directive: A Case Study of Ukrainian Higher Education and Research Ecosystems

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The Jean Monnet EU_NITRA_UKR project "Preventing Nitrate Pollution for Environmental Health" aims to prepare Ukrainian students in agricultural and environmental fields to implement the 1991 EU Nitrates Directive. The core methodology focuses on transforming its framework provisions into a multidimensional "communication and educational model" suitable for the digital age. The study uses a robust, proprietary database of nitrate levels in groundwater and surface water to demonstrate how quantitative analysis and digital modelling can identify nitrate-vulnerable zones (NVZs) in a changing agricultural climate. By integrating chemical analysis, comparisons of regulatory requirements, and qualitative expert interviews, the project creates a "scientific model" that translates complex legislative requirements into accessible educational programs. The project's methodological significance lies in creating an interdisciplinary discussion platform addressing the conflict between agricultural productivity and environmental health. The Digital European Research project uses research-based data to provide stakeholders – students, farmers, and policymakers - with the necessary scientific tools for post-war environmental recovery. The results demonstrate that the consistent effectiveness of EU directives depends on understanding localised digital and environmental data and propose a new methodology for integrating EU water protection standards into the circular economies of candidate countries. This approach not only increases the academic community's digital literacy regarding EU policies but also provides a scalable model for promoting territorial and social synergies through evidence-based policy advocacy.

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Keywords: *Nitrates Directive, Digital European Studies, Higher Education Ecosystems, Nitrate Vulnerable Zones, Ukraine-EU Integration, Environmental Education, Data-Driven Policy*

Bridging Inference and Prediction: Machine Learning for Evidence-Based Social Strategies in Europe

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Traditional social science research has long relied on statistical approaches focused on population-level inference, p-values, and the estimation of average effects under parametric assumptions. While essential for theory testing, these methods often struggle to capture the nonlinear complexity of contemporary social phenomena and provide limited guidance for actionable, individual-level decisions.

This presentation argues for integrating machine learning (ML) as a complementary methodological framework to support evidence-based policy and strategy development in the European context. By shifting the analytical focus from explanation to prediction, and prioritising out-of-sample generalisation over in-sample fit, ML models can uncover patterns and heterogeneity that may remain hidden under linear constraints.

Methodologically, ML algorithms can identify nonlinear relationships, interaction effects, and differentiated patterns across population subgroups without extensive manual feature engineering. Empirical illustrations from studies on consumer boycott participation and remote learning adaptation demonstrate how predictive models can provide granular insights into social behaviour.

Crucially, while these models enhance predictive understanding, correlation is not causation: ML predictions do not automatically reveal underlying causal mechanisms. Robust policy design still requires careful consideration of causal inference and theoretical reasoning. Techniques such as SHapley Additive exPlanations (SHAP) help bridge the gap by improving interpretability and providing substantive insights from predictive models.

By positioning ML as a complement rather than a replacement for traditional statistics, this integrated approach extends the analytical toolkit of social research. It allows researchers and policymakers to better anticipate complex social phenomena, design adaptive interventions, and generate data-informed strategies, while remaining mindful of the limits of predictive inference. Such a framework is essential for advancing evidence-based social and digital policy in European ecosystems.

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Keywords: *Machine Learning, Social Research, Evidence-Based Policy, Predictive Modelling, Shap*

Economic Synergy II:
Trade, Enterprise Adaptation, Finance, and Digital Transformation

The Impact of War on International Trade and Enterprise Adaptation Strategies: Lessons from Ukrainian Businesses

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The ongoing war in Ukraine has significantly disrupted international trade, creating unprecedented challenges for enterprises engaged in export and import activities. Rising geopolitical risks, logistical disruptions, sanctions, and currency fluctuations have forced companies to reconsider traditional trade strategies and adapt rapidly to remain competitive. This study examines the effects of the war on Ukrainian enterprises' external economic activities and identifies practical strategies for adaptation under crisis conditions. Key challenges include supply chain disruptions, transportation delays, rising costs, and fluctuating demand from international partners. Enterprises must also comply with evolving regulatory requirements in both domestic and foreign markets. The research emphasises that effective adaptation requires a combination of strategic planning, digital transformation, and risk management. Specifically, enterprises are increasingly adopting flexible supply chains, alternative sourcing strategies, digital platforms for trade monitoring, and agile financial management to mitigate the impact of war-related risks. Case studies from Ukrainian manufacturing and service enterprises demonstrate that proactive measures, such as diversifying export markets, implementing modern logistics solutions, and integrating enterprise resource planning (ERP) systems, can sustain trade operations even in unstable conditions. Furthermore, collaboration with international partners and adherence to global quality standards help preserve market access and strengthen competitiveness. This study highlights that while war presents significant threats to international trade, it also accelerates innovation and strategic resilience among enterprises. Lessons learned from Ukrainian businesses offer valuable insights for policymakers, international trade organisations, and enterprises operating in conflict-affected regions, emphasising the importance of adaptive strategies, risk management, and digitalisation in ensuring continuity of external economic activities.

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Keywords: *War Impact, International Trade, Enterprise Adaptation, Supply Chain Management, Digital Transformation, Risk Management, Export Strategy*

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Transformation of Consumer Behaviour on Marketplaces in the Context of the War in Ukraine: Aspects of Digitalization

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The current stage of global economic development is driven by the rapid expansion of e-commerce in both domestic and international markets, which reshapes consumer behavior and necessitates the adaptation of business strategies. The transition from linear retail to network-based structures has fundamentally altered the mechanisms of demand formation. Within the Ukrainian market – where e-commerce demonstrates resilience and stable growth even under wartime conditions – marketplaces have evolved beyond mere trading platforms into powerful instruments of socio-economic influence. The scale of this transformation is evidenced by statistics; according to Deloitte, the share of marketplaces in Ukrainian consumer choice has increased by 45% over the past three years.

A defining feature of the modern landscape is the emergence of a new consumption paradigm. Consumer preferences across different age groups traditionally vary, particularly in online formats; however, the rapid pace of e-commerce accelerates the digital transformation of young consumers' behavior. This shift characterizes by challenges of sustainable development, a trend toward rationalized purchasing, and a departure from the

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"authority" of established brands. Furthermore, it reflects national cultural nuances in purchasing choices and the widespread adoption of virtual assistants and other AI-driven tools.

Accordingly, the study of the transformation in consumer behavior is based on a statistical analysis of survey results from 235 respondents. This group, comprised of young individuals under the age of 35 who hold or are pursuing higher education, demonstrated a high degree of digital maturity. The findings indicate that under wartime conditions, this category of consumers has transitioned from sporadic online shopping to the regular and systematic use of marketplaces (over 30% of affirmative responses). It was established that a significant majority of respondents (over 60%) already have experience with AI tools, while many actively utilize platform-specific search instruments (55,3%) and virtual fitting rooms (47,7%). Furthermore, the study reveals a high level of trust in algorithmic recommendations (87,2%) and a profound understanding of the time-efficiency value provided by market platforms (66,8%). A quantitative assessment of these specific choice patterns among Ukrainian consumers serves as a foundation for substantiating mechanisms for the transition toward a sustainable development model in digital commerce.

Keywords: *Consumer behavior, Marketplaces, E-commerce, Digitalization, Sustainable development, AI tools.*

Digitalisation of Small and Medium-Sized Enterprises Under Resource Constraints

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Small and medium-sized enterprises (SMEs) play an important role in modern economies by generating a significant share of employment and economic activity. However, many SMEs operate under resource constraints, which limit their ability to adopt advanced technologies and innovative management practices. In this context, digitalisation becomes a key factor for increasing competitiveness, improving productivity, and expanding market opportunities. The use of digital platforms, cloud services, and e-commerce enables small businesses to optimise operations and respond more effectively to market changes. Despite these opportunities, the level of digital transformation among SMEs remains uneven. Many enterprises face barriers such as financial constraints, a shortage of qualified specialists, limited digital skills, and insufficient infrastructure. These factors contribute to a persistent digital gap between large enterprises and SMEs, slowing the integration of small businesses into the digital economy. To address these challenges, governments and international organisations implement support programmes to facilitate SME digitalisation. Initiatives developed by institutions such as the World Bank, the European Bank for Reconstruction and Development, and the European Union combine financial instruments with advisory and

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training support. Such programs help SMEs access digital technologies and develop the competencies required to use them effectively. The study examines international practices of SME digitalisation and highlights key technological solutions, including ERP systems, cloud computing, and Internet of Things technologies. The findings indicate that effective digital transformation of SMEs is possible even under resource constraints when supported by appropriate institutional frameworks and targeted support measures.

Keywords: *SME Digitalisation, Digital Maturity Assessment, International Development Programmes, Cloud Adoption, Advisory Services, Productivity, Impact Evaluation*

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Formation of a Multi-Level Model of Strategic Management of the Competitiveness of an Industrial Enterprise

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Increasing the competitiveness of an industrial enterprise is a complex, multi-component and hierarchically structured set of measures that requires systematic management and a strategically oriented approach. Accordingly, the starting point for increasing an enterprise's competitiveness is the development of a holistic, adaptive, and scientifically based model for managing this increase, considering all aspects of promotion and counteraction, including factors of uncertainty, risk, and institutional constraints. The first stage of the model is comprehensive diagnostics of the enterprise's competitiveness, which should be conducted using systemic, process, and resource-competence approaches. This diagnostic includes an in-depth analysis of the enterprise's external environment, an analysis of competitive advantages, and a multi-criteria assessment of product competitiveness, considering their consumer value, quality, price, and innovativeness. After conducting a comprehensive diagnosis, a reasoned management decision is made regarding the feasibility of increasing the enterprise's competitiveness by comparing the costs of implementing the relevant measures with the expected economic, social, and strategic effects, and by assessing alternative development scenarios. An important role in the model is the formation of strategic goals and

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tactics to increase the enterprise's competitiveness. When determining goals, it should be considered that they must be real, achievable, consistent with the enterprise's overall development strategy, and suitable for both quantitative and qualitative measurement within a balanced indicator system. At the next stage, one or more measures are selected, and their economic assessment is carried out. Among the areas of increasing the competitiveness of the enterprise, the main measures are: modernization of the production and technological base; introduction of innovative technologies and digital solutions; optimization of logistics and operational processes; improvement of the personnel management system and human capital development; diversification of the product range; activation of marketing activities and brand promotion; formation of an effective pricing policy; expansion of sales channels and entry into new markets; integration into strategic alliances and partnerships, etc. The next stage of the model is the development of an integrated system to assess the effectiveness of selected measures, which involves constructing a general index of the enterprise's competitiveness based on multidimensional statistical and economic analyses. The next stage is implementing the selected strategy to increase competitiveness, which involves coordinating actions across all structural divisions of the enterprise, providing resources for the measures, and establishing mechanisms to control their execution. The final stage is monitoring and adjusting the implemented measures, which is carried out based on the continuous collection and analysis of information on the results of the enterprise's activities, changing environmental conditions, and the level of achievement of strategic goals. In the event of deviations from the planned indicators, the strategy is adapted, and management decisions are adjusted.

Keywords: *Enterprise Competitiveness, Strategic Management, Multilevel Model, Integrated Assessment, Competitive Advantages, Diagnostics of Competitiveness, Competitive Potential*

Financial Support of Export Activities of Enterprises

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Financial support of export activities is a key determinant of enterprises' competitiveness in international markets. The study systematises sources of export financing, identifies major risks and mitigation tools, and analyses mechanisms of state support for exporters. It is substantiated that the effective combination of financial instruments and managerial decisions contributes to the expansion of export potential and the strengthening of macroeconomic stability.

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Keywords: *Financial Support, Export Activity, Export Financing, State Support, Currency Risks, Factoring, Forfaiting*

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The Role of Crowdfunding in Investment Management: Opportunities and Benefits

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Investment activity plays a key role in ensuring sustainable enterprise development and competitiveness, especially under economic instability, military challenges, and digitalisation. However, investment growth is often hindered by insufficient investment resources and ineffective management. Many problems can be addressed through innovative capital-raising mechanisms and digital tools. One way to attract additional investment resources is crowdfunding – the collective financing of projects through digital platforms. There are different types of crowdfunding. For investment management purposes, debt-based (LendingClub, Prosper) and equity-based (SeedInvest, StartEngine, WeFunder, Republic, CircleUp) crowdfunding are most used. The use of crowdfunding platforms allows enterprises to bypass traditional financial barriers. Through equity-based crowdfunding, enterprises can attract funds from many small investors in exchange for a share in the company. This approach expands opportunities to raise investment capital and increases the number of potential investors, thanks to the advantages of online platforms. It also makes it possible to build a community that supports the project idea, implement riskier, more innovative projects, reduce dependence on a single source of financing, and diversify the investment portfolio. However, this method is more commonly used by start-ups and small

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and medium-sized enterprises, while large enterprises rarely use it today. There are also benefits for investors. They receive a share of the company's capital in proportion to their contribution, and platforms often provide them with access to reports on project progress and financial performance. Investors may also receive dividends. However, the main benefits for investors are the potential increase in the value of their shares and participation in the project's development. Currently, crowdfunding is gaining popularity and expanding its user base, while business interest in digital capital is growing. However, it is unlikely to replace traditional sources of investment financing.

Keywords: *Investment, Crowdfunding, Opportunities, Investor, Equity-Based*

Methodological Track II:
Digital Pedagogy in Teacher and Language Education

Modernisation of Professional Training of Future Philology Teachers in the Context of European Educational Trends

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The modernisation of professional training for future philology teachers is driven by the need to harmonise the national education system with European quality standards. The strategic guidelines for this process are defined within the European Higher Education Area, established through the Bologna Process. Compliance with these principles entails transparency of educational programs, academic mobility, a student-centred approach, and the continuous improvement of quality assurance systems. The regulatory framework for modernisation in Ukraine is based on the Laws of Ukraine "On Education" and "On Higher Education", which regulate the competence-based model of specialist training, the autonomy of educational institutions, and an orientation toward learning outcomes. In accordance with the provisions of the Ministry of Education and Science of Ukraine, higher education standards for the speciality emphasise the formation of core competencies for future teachers: subject-specific, methodological, communicative, and digital. European guidelines for language training are outlined in the "Common European Framework of Reference for Languages" (CEFR), developed by the Council of Europe. It emphasises the importance of developing intercultural communication skills, learner autonomy, and an action-oriented approach. These provisions necessitate integrating interactive methods, case technologies, project-based activities, and modern digital tools into the educational process. This update to the methodological toolkit aims to equip future educators with effective techniques for teaching Ukrainian and to develop professional skills in the context of Ukraine's new

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educational philosophy. This requires a thorough modernisation of current educational standards at all levels. For instance, in the methodology of studying Ukrainian lexicology and phraseology, it is advisable to use practical media cases such as "Detective Storytelling," which involves creating a short video (up to 2 minutes) whose plot is based on a lexical error (e.g., a paronymy). The video depicts a "crime" occurring when a character confuses the addresser with the addressee or issues a season ticket instead of a subscriber ticket. "Phraseological Stylist": visualisation of how phraseological units make speech emotional and colourful. In the methodological commentary for the video (or in its description), the student must specify the educational stage implemented by this digital product (motivation, explanation, or reinforcement). Thus, the modernisation of training for future philology teachers is based on a combination of national regulatory requirements and European standards. This ensures a high-quality update of educational content, a transition to a competence-based model, and the formation of a competitive specialist. The ultimate result of such modernisation is the training of an innovative teacher capable of acting effectively in a digital educational environment while maintaining a high level of native language culture.

Keywords: Case Technologies, Competence-Based Approach, Digital Tools, Educational Modernisation, European Standards, Philology Teacher Training

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Bridging Technology and Empathy: Digital Interactive Boards in Fostering Speaking and SEL Skills in Teacher Education

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This article explores the linguistic and methodological underpinnings of developing speaking skills in pre-service English teachers through the integrated use of digital interactive boards and social-emotional learning (SEL) strategies. Despite the proliferation of digital technologies in teacher education, the systematic incorporation of SEL into speaking instruction remains

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under-theorised, particularly in blended learning environments, where sustaining engagement and meaningful interaction pose persistent challenges. The study reconceptualises digital interactive boards not merely as presentational aids, but as multifunctional pedagogical platforms that facilitate collaborative, emotionally attuned learning. It illustrates how these tools can support SEL-informed speaking practices, including interactive role-plays, dialogic exchanges, and peer-mediated feedback, as well as reflective activities conducted both asynchronously and in real time. Such practices contribute to a psychologically safe and inclusive learning environment, mitigating speaking anxiety, fostering emotional awareness, critical thinking, and empathy, while enhancing learner participation, collaboration, and the ability to navigate diverse social interactions. The study places particular emphasis on the strategies and activities through which digital interactive boards support the implementation of SEL and enhance English-speaking competence, notably by cultivating emotional intelligence, self-efficacy, and the capacity for authentic interpersonal communication. The study argues that integrating SEL with digital interactive boards aligns with contemporary learner-centred and communicative paradigms, promoting more inclusive, adaptive, and responsive pedagogical practices. The results underscore the considerable potential of this integrative approach to enrich both affective and linguistic dimensions of teacher education. It is concluded that the deliberate incorporation of digital interactive boards within an SEL-oriented framework constitutes a pedagogically robust strategy for addressing the evolving demands of modern language education.

Keywords: *Digital Interactive Boards, Interactive Teaching, Social-Emotional Learning (SEL), Speaking Skills, Pre-Service English Teachers*

Using Interactive Digital Tools to Develop English Grammatical Competence with Authentic Podcasts Among Senior High School Students

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This article investigates the use of authentic English-language audio and video podcasts, supported by interactive digital tools, to develop grammatical competence among senior high school students. Although grammatical competence is a core component of English communicative competence, its development through technology-enhanced instruction remains underexplored in Ukrainian general secondary education. Addressing this gap, the study proposes a theoretically grounded and pedagogically elaborated methodology for integrating interactive digital tools into grammar instruction based on authentic English-language podcasts at the senior high school level. Within this framework, interactive digital tools are conceptualised not merely as supplementary resources but as a central pedagogical mechanism enabling structured engagement with authentic language input. They facilitate

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guided inductive noticing of grammatical features, support collaborative meaning-making, carefully scaffold communicative practice, and provide immediate, adaptive formative feedback. Podcast-based instruction, mediated by digital tools, is thus positioned as a motivating and pedagogically effective approach that promotes meaningful interaction with authentic language across diverse sociocultural contexts. The article examines the methodological potential of authentic audio and video podcasts in digitally enriched learning environments, emphasising their capacity to expose learners to naturalistic speech patterns and grammatical structures characteristic of real-life communication. The findings suggest that the systematic integration of interactive digital tools enhances learner motivation, deepens grammatical awareness in communicative contexts, and fosters learner autonomy. In addition, the use of such tools contributes to the development of higher-order thinking skills, intercultural competence, and digital literacy, while pedagogical scaffolding is identified as essential for optimising learning outcomes. The study further establishes criteria for the principled selection of authentic English-language podcasts within technology-enhanced instruction, offering clear guidelines for classroom implementation. A three-stage system of exercises is proposed, structured around pre-listening, while-listening, and post-listening phases, each designed to integrate interactive digital tools into the development of grammatical competence. The article concludes with evidence-informed recommendations for embedding digitally mediated, podcast-based tasks into senior high school EFL curricula.

Keywords: *Grammatical Competence, Interactive Digital Tools, Authentic Podcasts, EFL Instruction, Senior High School Students*

Developing Digital Literacy of Future Teachers with Mentimeter

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Modern society is characterised by the rapid development of digital technologies, which is driving a transformation in education. Today, teachers are not only sources of knowledge but also organisers of the digital educational environment. In these circumstances, proficiency in digital technologies is becoming an essential component of a teacher's professional competence. It is important to remember that a teacher's digital literacy forms the basis for developing pupils' digital competence. The digitalisation of education and the shift towards distance and blended learning have made the use of interactive online tools increasingly important in the training of future teachers. One such tool is Mentimeter, which enables the delivery of professional knowledge and the development of skills and competencies through its real-time capabilities. There are undeniable advantages to using this online platform. These include, first and foremost, enhancing learning interactivity by encouraging all students to participate actively through surveys, polls, and discussions. Secondly, the anonymity of

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responses, which encourages greater openness among students, reduces the fear of making mistakes and encourages participation even among less active learners. Another advantage is its accessibility and user-friendliness, thanks to a simple interface and the ability to access it from any device with an internet connection. For the teacher, instant feedback is crucial, as it allows them to quickly assess students' understanding of the material and adjust the lesson by adding explanations or setting new tasks. Visualising results in the form of diagrams, word clouds and other slides enhances clarity and makes it easier for students to absorb the information. Our experience using Mentimeter in training future teachers has demonstrated its effectiveness as a distance-learning tool that enhances interactivity, provides rapid feedback, and promotes the development of digital competence.

Keywords: *Digital Literacy, Future Teachers, Mentimeter, Interactive Learning, Digital Technologies, Competence-Based Approach, Distance Learning*

Development of Leadership Qualities of Future Educational Managers in the Context of Digital Transformations: the Experience of the USA and Ukraine within the Framework of EU Policies

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In the context of digital transformation in education, there is a growing need to develop a new generation of educational managers capable of effectively performing leadership functions in dynamic, technology-intensive environments. The development of leadership qualities among future educational managers in higher education institutions has become particularly relevant amid global change and the European integration of educational systems. The aim of this study is to provide a theoretical justification and comparative analysis of approaches to developing the leadership qualities of future educational managers at universities in the United States and Ukraine, with consideration of European Union policies on digital education and the development of educational ecosystems. The methodological basis of the research includes systemic, comparative, and competency-based approaches, which enable the identification of both common and distinctive features of training educational leaders across different educational models. Methods of scientific literature analysis, EU regulatory documents in the field of digital education, and synthesis of international experience were used. Special attention is given to the concept of digital leadership as an integral component of professional training for educational managers. The findings indicate that universities in the United States emphasise practice-oriented leadership development, flexible managerial skills, and digital competence. In Ukraine, there is a gradual integration of European approaches to educational management; however, there is still a need to strengthen the practical component and further develop digital leadership skills. It has been established that

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EU policies in the field of digital education, particularly the Digital Education Action Plan, create new frameworks for preparing educational leaders oriented toward innovation, inclusivity, and cross-sectoral collaboration. This sets out the prerequisites for harmonising Ukraine's educational practices with the European Educational Area. The conclusions emphasise that the formation of leadership qualities in future educational managers should be based on integrating digital competencies, innovative thinking, and intercultural experience, aligning with the EU strategic priorities for the development of educational ecosystems. Prospects for further research include developing models to assess digital leadership in higher education.

Keywords: *Leadership, Educational Management, Digital Transformation, Educational Ecosystems, EU, USA, Ukraine*

An Interactive Approach to Teaching Grammar in a Digital Learning Environment

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Today, distance learning has shifted from a temporary solution to a stable format in higher education, and the key challenge is to ensure not only access but also effective learning. This paper presents the results of implementing an interactive approach in teaching the course "Practical Grammar of the Turkish Language," which covers phonetic, morphological, and syntactic levels. The analysis of traditional instructional models (textbook-based in-class activities and homework assignments) revealed several limitations related to the design of instructional materials: tasks often encourage mechanical completion, lack structured progression, fail to adapt to specific group proficiency levels, and exclude listening as a core component of grammar acquisition. The proposed approach is based on the digital interactive platform Wayground and involves a staged introduction to grammatical structures. The process begins with listening activities, followed by practice tasks in varied contexts, and concludes with oral production. This design reflects the principles of multimodal learning and repeated exposure, which contribute to the development of stable grammatical competence. Interactive tools enable synchronous student participation, prevent passive engagement, and enhance communication between participants in the learning process. Technical features such as timers, restricted navigation, and automated assessment support academic integrity and ensure objectivity in evaluation. This combination creates a social-educational synergy, making the interaction among students, the instructor, and the digital environment more structured and effective, as confirmed by empirical data from student surveys, with most respondents reporting better understanding and higher engagement. Thus, interactive digital tools contribute to the formation of social-educational synergy, reflecting broader trends in the digitalisation of higher education.

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Keywords: *Second Language Acquisition, Listening Comprehension, L2 Grammar Instruction, Multimodal Learning, Interactive Learning, Digital Learning Environment*

Economic and Organisational Transformation: HR, Communication, and Workplace Adaptation

The Digital Mindset within the Professional Competency Framework of HR Managers in the Context of Digital Transformation

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The study examines the transformation of the HR manager's role in response to modern technologies and the development of a digital mindset. It explores the evolution from basic data digitisation to the strategic digitalisation of all stages of human resource management. Particular attention is given to implementing automated systems, such as ATS and LMS, and to using artificial intelligence to optimise recruitment and training processes. The paper emphasises the critical importance of a data-driven approach, in which analytics serves as the foundation for objective managerial decision-making. As a result, a new standard of HR competencies is identified, combining technological literacy with a human-centred perspective to enhance overall business performance.

Keywords: *Digital Mindset, HR Manager, Professional Competencies, Digital Transformation, Human Resource Management, Data-Driven HR*

Competency-Based HRM Reform in Customs Administration in the Context of EU Integration

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Competency-based reform of human resource management in customs administration is increasingly recognised as a strategic driver of institutional modernisation in the context of European integration. As customs authorities operate at the intersection of trade facilitation, security control, and public service delivery, their effectiveness largely depends on the quality and adaptability of human capital. Aligning HRM practices with European Union governance standards requires a shift from traditional administrative personnel management toward competency-oriented approaches that emphasise performance, accountability, professional integrity, and continuous learning. In the EU integration environment, customs officers are expected to combine strong legal and analytical expertise with advanced digital capabilities and collaborative skills. The growing use of electronic customs systems, data analytics, and

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risk management tools necessitates the development of digital competencies and evidence-based decision-making abilities. At the same time, ethical conduct, transparency, and communication skills remain essential for building public trust and ensuring compliance with international trade regulations. Competency frameworks serve as an important mechanism for structuring recruitment processes, guiding performance appraisal, and designing targeted professional development programmes. Such frameworks also support strategic workforce planning by helping institutions identify skills gaps, manage talent retention, and prepare future leadership within customs services. The implementation of competency-based HRM is further reinforced by the digital transformation of public administration. E-learning platforms, virtual training modules, and integrated HR information systems enable customs authorities to respond more flexibly to evolving policy requirements and operational challenges. These tools facilitate knowledge sharing across agencies and contribute to the harmonisation of administrative practices with EU standards. In the long term, competency-oriented reforms enhance organisational resilience, improve service quality, and strengthen interagency cooperation at both national and European levels. Consequently, the modernisation of HRM systems in customs administration can be viewed as a critical component of governance convergence and sustainable institutional development within the broader process of European integration.

Keywords: *Competency-Based HRM, Customs Administration, European Integration, Institutional Capacity, Digital Transformation*

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Enhancing Team Interaction Through Digital Onboarding: A Pathway to Social Synergy in Modern Enterprises

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In the evolving digital economy of the European Union, the sustainable development of innovation ecosystems increasingly depends on effective human resource management and high-quality team interaction. A critical factor in fostering such interaction is the employee onboarding process, which is gradually transforming from a routine administrative procedure into a strategic tool for organisational integration and long-term workforce retention. This study explores the role of digital onboarding in enhancing team interaction and social synergy within modern enterprises. The research applies a qualitative approach, incorporating elements of case analysis and comparative review of EU-based organisational practices. Particular attention is given to applying Design Thinking principles to develop human-

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centred onboarding experiences, including empathy-driven needs assessment, iterative prototyping of onboarding pathways, and continuous integration of feedback. The findings demonstrate that integrating digital collaboration and project management platforms significantly accelerates the social and professional adaptation of new employees, particularly in remote and hybrid work environments. Such tools contribute to transparent goal-setting, improved cross-functional communication, and the creation of accessible organisational knowledge bases. As a result, organisations report increased levels of trust, team cohesion, and operational agility. Furthermore, the study highlights the importance of aligning digital onboarding strategies with EU social and educational policies, particularly to facilitate the transition of higher education graduates into the labour market in Central and Eastern Europe. The proposed framework contributes to reducing employee turnover, overcoming barriers to digital inclusion, and promoting lifelong learning practices. The paper's scientific contribution lies in developing a structured approach to digital onboarding as a driver of social synergy, combining human-centred design with digital tools and process-oriented management. Practically, the study offers a roadmap for HR professionals and business leaders to design onboarding systems that enhance team interaction, support employee development, and strengthen organisational resilience in the digital era.

Keywords: *Team Interaction, Digital Onboarding, Design Thinking, Social Synergy, Innovation Ecosystems, Lifelong Learning*

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A Company's Tone of Voice as an Element of Business Communication and Reputation Building in Social Networks and Messengers

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In today's digital business environment, a significant portion of communication between companies and their audiences occurs on social media and messaging apps, which enable rapid information exchange and direct contact with customers. Therefore, it is important to form a unified brand communication style – Tone of Voice. It determines how the company speaks, encompassing the level of formality, emotionality, humour, and format of the address. Tone of Voice plays several important roles on social media. First, it helps build brand awareness. When a company uses the same communication style across channels–for example, posts, comments, and messages–it creates a cohesive brand image in the minds of consumers. Second, Tone of Voice acts as a tool for building trust with the audience. Consistent communication demonstrates the company's professionalism and openness, which positively impacts its reputation. Third, Tone of Voice plays an important role in reputation management. In situations of criticism, complaints, or crisis communications, a company's response style can either reduce tension or, conversely, intensify conflict. If the company's communication style is consistent, accurate, and focused on customer needs, it contributes to a positive image of the organisation and strengthens its competitive position. At the same time, communication mistakes can lead to reputational risks. Among the most common problems are a lack of a unified communication style and either excessive familiarity or an overly formal tone. In the digital environment, such mistakes spread quickly and can negatively affect the company's image. Thus, Tone of Voice is an important tool for a company's business communication on social media and messengers. It determines the brand's communication style, influences the audience's perception of the company, and plays a significant role in shaping its reputation.

Keywords: *Tone of Voice, Business Communication, Company Reputation, Social Networks, Messengers, Digital Communications*

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Management Strategies for Engaging Generation Z: Flexibility, Mentorship, and a Value-Based Approach

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The increasing integration of Generation Z (individuals born in the late 1990s–early 2010s) into the global labour market is significantly transforming established approaches to human resource management. Unlike previous cohorts, Generation Z employees demonstrate a strong orientation toward work-life balance, psychological well-being, and flexible employment conditions, while showing lower tolerance for rigid hierarchical structures and excessive organisational control. This shift challenges the effectiveness of traditional motivational models and necessitates a reconsideration of managerial practices. In the author's opinion, the growing mismatch between classical management approaches and the expectations of younger employees is a key driver of increased staff turnover and declining organisational engagement. The study is based on a critical analysis and synthesis of contemporary academic literature and practical HR management reports, as well as the logical generalisation of existing approaches to workforce management in the context of generational change. The analysis has made it possible to identify three key dimensions requiring adaptation within modern management systems. First, the transformation of communication practices is essential. Generation Z employees, having developed in a highly digitalised environment, demonstrate a strong preference for rapid information exchange and continuous feedback. Traditional performance appraisal systems, particularly those based on annual evaluations, are increasingly perceived as ineffective due to their low responsiveness. In the author's opinion, implementing real-time feedback mechanisms and iterative communication models is critical for maintaining engagement and productivity. Second, a substantial shift in motivational priorities has been identified. For Generation Z, intrinsic factors–such as flexibility, meaningful work, and emotional well-being–often outweigh traditional extrinsic motivators, including salary growth and hierarchical career advancement. Excessive control and micromanagement tend to accelerate professional burnout and reduce organisational loyalty. In the author's opinion, sustainable motivation among young employees requires integrating flexible work arrangements and developing supportive organisational cultures. Third, the role of leadership is undergoing a fundamental transformation. Directive and authoritarian management styles demonstrate limited effectiveness among Generation Z. Instead, there is a growing demand for leaders who act as mentors, facilitators, and partners in professional development. Moreover, alignment with organisational values and the perceived social impact of work play a decisive role in shaping employee commitment. In the author's opinion, value-based leadership and mentorship-oriented management models are critical prerequisites for effective interaction with this generation. The effective management

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of Generation Z is grounded in the principles of flexibility, continuous communication, and value alignment. Organisations seeking to remain competitive must move beyond traditional hierarchical models and adopt adaptive, human-centred management strategies. In the author's opinion, the future of workforce management lies in integrating mentorship practices, dynamic feedback systems, and organisational environments that support both professional and personal development.

Keywords: Generation Z, Management, Work-Life Balance, Leadership, Mentorship, Corporate Culture

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Methodological Track III:
AI, Assessment, and Legal-Ethical Transformation in Education

Fostering Responsible AI Workflows Through Digital Pedagogy and Authentic Assessment

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The rapid integration of generative artificial intelligence (AI) into European higher education demands innovative approaches to digital pedagogy and assessment. Aligned with UNESCO's 2024 human-centric guidelines and Ukrainian national recommendations for AI literacy, this study explores the methodological transformation of future teacher training. The research is grounded in the POWER model (Purposeful, Optimal, Wise, Ethical, and Responsible), which serves as a theoretical framework for cultivating an ethical AI culture among educators. Drawing on the empirical results of the practical course "Artificial intelligence in learning and professional activity" for pre-service philology teachers, this paper presents a comprehensive methodology for embedding responsible AI workflows into academic practice. The course's pedagogical focus shifted from AI-driven content generation to rigorous fact-checking and critical verification. Throughout the training, students mastered

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advanced prompt engineering techniques and utilised specialised AI agents for both academic research and the creation of multimodal didactic content. A pivotal methodological innovation was the introduction of a transparent AI attribution and assessment system designed to mitigate the "panic of accidental plagiarism." This system categorises academic outputs into three distinct levels: NIA (Non-AI Assisted), AIA (AI-Assisted), and GIA (Generative AI). By mandating the declaration of AI tools and prompts and requiring manual verification processes, the assessment paradigm shifted from merely evaluating the final text to assessing students' digital competence, algorithmic thinking, and ethical compliance. The findings demonstrate that implementing structured AI attribution alongside the POWER framework significantly reduces academic dishonesty while enhancing critical thinking and adaptability. Ultimately, this methodological approach provides a scalable roadmap for Polish and Ukrainian higher education ecosystems to harmonise digital pedagogy with EU policies, ensuring secure, transparent, and innovative digital European studies.

Keywords: *Digital Pedagogy, Authentic Assessment, Artificial Intelligence, POWER Model, AI Literacy, Academic Integrity, Responsible AI Workflows*

Application of Artificial Intelligence in the Educational Process

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The study examines the pedagogical conditions and practical implications of integrating artificial intelligence into the educational process, with a focus on its impact on personalised learning, teaching practices, and assessment. The findings indicate that AI technologies enhance adaptive learning and automate assessment, but their effectiveness depends on teachers' digital competence, methodological readiness, and ethical awareness.

In contemporary educational settings, the use of AI in the learning process has become an important factor in improving the quality and accessibility of learning. AI technologies enable educators to adapt instructional content to individual learners' needs, automate assessment processes, monitor academic progress, and provide timely feedback. Furthermore, AI-based tools support the development of interactive learning environments and contribute to data-driven educational decision-making.

The integration of AI into the educational process also creates new opportunities to enhance teachers' digital competence, foster innovative pedagogical approaches, and increase student engagement and motivation. At the same time, without appropriate training and methodological support, the potential of AI cannot be fully realised. Moreover, ethical considerations play a crucial role in the implementation of AI in education. Issues such as data privacy, algorithmic bias, and digital equity should be addressed carefully to ensure the responsible and equitable use of technology.

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The study demonstrates that the effective application of AI in education depends on methodological readiness and pedagogical awareness. Therefore, AI should be considered not only as a technological innovation but also as a tool for modernising teaching practice in accordance with current social and professional demands. However, its educational value depends on balancing technological innovation with the preservation of the educator's central role in the learning process. The long-term effectiveness of AI integration depends on teachers' professional readiness, ethical regulation, and sustainable educational policy.

Thus, the integration of AI into the educational process should be viewed not only as a technological innovation but also as a pedagogically grounded tool that transforms teaching practice. AI-based educational tools require critical evaluation of methodological effectiveness and institutional readiness for digital transformation, with the teacher maintaining a key guiding and integrative role.

Keywords: *Artificial Intelligence, Digital Competence, Teaching Practices, Personalised Learning, Educational Innovation*

Threat of Modern AI in Higher Education

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Once a niche concept reserved for IT departments, Artificial Intelligence has rapidly evolved into the foundational infrastructure of modern higher education. This rapid shift is forcing universities to fundamentally reimagine pedagogical models and academic integrity. A major benefit of AI infrastructure is the transition from a "one-size-fits-all" approach to personalised learning. Systems analyse student performance in real-time, dynamically adjusting content difficulty and offering AI tutors to help students overcome specific academic hurdles. This trend is particularly visible in huge online programs, where AI tutors provide constant support. Generative AI tools have sparked a massive crisis in academic assessment. While student plagiarism is the obvious panic, a hypocrisy has emerged: professors using AI to grade assignments. It is deeply demoralising for students to pour their lived experiences into an essay, only to receive feedback from a soulless machine incapable of genuine empathy or comprehension. The University of Arkansas went so far as to assemble entire AI committees to "identify ways to incorporate AI into the curriculum". "Gen-AI" is killing the art of writing, it's killing learning skills. Modern students are reading less, struggling to articulate their thoughts, and operating with shrinking vocabularies. There is a term called the Flynn Effect, which refers to the consistent upward drift in IQ test scores across generations. However, the "Reverse Flynn Effect" shows that generational IQ scores have been declining over the last 13 years, after half a century of growth. Generation Alpha is on track to be "less smart" than Generation Z. The situation is poised to worsen as AI-generated "slop" silently infiltrates the

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articles and books we rely on to enrich our minds. Unless we intervene and let this "AI bubble" burst, we face a future where not only human jobs are replaced, but the survival of genuine literature and human intellect is fundamentally threatened.

Keywords: *Artificial Intelligence (AI), Generative AI (Gen-AI), Students, Generation, Flynn Effect, AI Bubble*

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Digital Transformation of Legal Education in the European Union: Strategic Directions and Challenges

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In the context of global digital transformation, the system of legal professionals' training in the EU countries is undergoing significant changes. Digitalisation of legal education involves integration of innovative learning technologies, including e-learning platforms, virtual courtroom simulations, artificial intelligence tools for legal analysis, and digital legislative databases. These approaches enhance not only knowledge acquisition but also the development of practical skills necessary for legal practice in a digital environment. The European experience demonstrates a strong commitment to embedding digital technologies into legal education to improve quality, accessibility, and competitiveness. Strategic policy documents emphasise the need to prepare legal professionals to use digital tools and AI in judicial processes, while ensuring the protection of human rights and personal data in the digital space. The ongoing transformation of the legal profession creates both opportunities and challenges. The emergence of the concept of "digital lawyering" highlights the growing importance of hybrid professional roles that combine legal expertise with technological competencies. These developments enable more efficient and accessible legal services but also raise concerns about data protection, online security, freedom of expression, and the protection of vulnerable populations. Consequently, the formation of digital literacy among law students becomes a critical priority. This includes not only technical skills but also the ability to understand the interplay between law and technology, to critically assess digital

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tools, and to apply them appropriately in professional contexts. Moreover, modern legal education increasingly requires developing interdisciplinary competencies, collaborative skills, problem-solving abilities, and an understanding of design thinking as a tool for innovation in legal services. Thus, digitalisation represents a key direction of legal education modernisation in the European Union. It requires a comprehensive rethinking of educational models to ensure that future legal professionals are equipped to operate effectively in a rapidly evolving, digitally mediated legal environment.

Keywords: *Legal Education, Professional Training, Digital Transformation, Digital Literacy of Law Students*

Teaching Smarter: Digital Tools and the Future of Assessment

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The rapid integration of educational technology has catalysed a shift from traditional summative assessment toward more nuanced, formative approaches. This paper examines the transformative role of digital tools–ranging from AI-driven analytics to gamified assessment platforms–in enhancing the feedback loop between educators and students. By leveraging real-time data, these tools enable personalised learning pathways and just-in-time interventions that were previously unattainable in standardised classroom settings.

The study employs a qualitative analysis of contemporary digital assessment frameworks, evaluating their effectiveness in measuring higher-order thinking skills rather than rote memorisation. The findings indicate that, while digital tools significantly reduce teachers' administrative workload, their greatest value lies in fostering student agency and offering a more granular perspective on competency-based progression.

At the same time, the paper addresses key challenges associated with digital assessment, including data privacy concerns, inequities related to the digital divide, and the potential for algorithmic bias in automated evaluation systems.

Digital assessment represents a shift toward more personalised and responsive learning, but its success depends on ethical use and equitable access.

Keywords: *Digital Assessment, Formative Feedback, Learning Analytics, Educational Technology, Student Agency, Algorithmic Bias*

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Volume 2

Human-Centred AI, European Resilience and Crisis Preparedness

Multi-Vector Security and Hybrid Warfare: Reframing European Resilience on the EU's Eastern Flank in the Digital Age

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This paper examines how hybrid warfare has fundamentally reconfigured the security environment in Central and Eastern Europe and argues that European resilience must be rethought through a multi-vector security model. Contemporary threats are no longer limited to conventional military force; rather, they combine cyber operations, disinformation, economic coercion, energy pressure, the instrumentalisation of migration, legal ambiguity, and psychological influence to weaken democratic institutions, strategic trust, and social cohesion. Focusing on Poland and the wider eastern dimension of the European Union, the paper shows that security should be understood as an integrated system linking territorial defence, digital resilience, strategic communication, critical infrastructure protection, legal preparedness, and civic readiness.

Drawing on security studies, political science, and European governance, the analysis conceptualises hybrid warfare as a strategy that exploits the openness, procedural complexity, and normative constraints of democratic systems. Particular attention is devoted to the idea of multi-vector security, understood here as coordinated action across military, informational, technological, legal, economic, and societal domains. The paper further argues that resilience in the digital age depends less on isolated sectoral responses than on integrated governance that combines deterrence, preparedness, institutional coordination, and public legitimacy. In this regard, universities and research ecosystems emerge as important actors in building resilience through media literacy, counter-disinformation education, scenario-based training, and policy-relevant research. The article concludes that Digital European Studies offers a useful framework for connecting security policy, democratic stability, and territorial resilience on the EU's eastern flank.

Keywords: Hybrid Warfare, Multi-Vector Security, European Resilience, Digital Resilience, Disinformation, Critical Infrastructure, Democratic Security, Poland

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Crisis Resilience in Higher Education: Building Permanent Preparedness Amid War, Pandemic, and Institutional Uncertainty

Mariusz Dudek

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This paper argues that crisis resilience in higher education should not be understood merely as a temporary emergency response, but as a lasting institutional capacity developed under conditions of overlapping disruption: war-related insecurity, post-pandemic instability, dependence on digital technologies, and broader regulatory and organisational uncertainty. Focusing on Polish higher education institutions within the wider European policy environment, the paper identifies four interdependent dimensions of academic resilience: organisational flexibility, digital preparedness, clarity of management and legal frameworks, and social and psychological support for students and staff.

Drawing on the lessons of the COVID-19 pandemic, the war in Ukraine, and recent European debates on the functioning of universities in times of crisis, the study highlights structural vulnerabilities in institutional communication, remote teaching infrastructure, internal quality assurance, decision-making procedures, mental well-being, and cross-border academic cooperation. Rather than treating crises as temporary interruptions, the paper proposes a model of permanent preparedness based on scenario planning, interoperable digital tools, crisis-sensitive leadership, and community-based support mechanisms.

Its central argument is that resilient universities are not only those capable of maintaining operational continuity during disruption, but above all those able to transform crisis experience into institutional learning, adaptive capacity, and long-term organisational effectiveness. In the context of Polish higher education, this requires embedding crisis management into university administration, teaching, staff development, and research cooperation as an integral component of both digital and European transformation.

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Keywords: *Crisis Resilience, Higher Education, Permanent Preparedness, Digital Preparedness, University Governance, Institutional Uncertainty, War-Related Insecurity, Poland*

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Countering Manipulation in the Digital Space: The EU Experience

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Countering manipulation in the digital space is a key priority of the European Union in protecting democratic processes, information security, and citizens' rights. Manipulative practices, including disinformation, fake news, bot networks, microtargeting, and algorithmic amplification, increasingly shape public opinion and create systemic risks for digital societies.

The European Union has developed a comprehensive, multi-level approach that combines regulatory, technological, and educational measures and emphasises active cooperation among higher education institutions, civil society, and state authorities. A central instrument is the Digital Services Act, which establishes obligations for online platforms to ensure algorithmic transparency, assess systemic risks, and implement effective measures against disinformation. Complementing this framework, the General Data Protection Regulation limits the manipulative use of personal data and strengthens protections against microtargeting. An important co-regulatory mechanism is the Code of Practice on Disinformation, which fosters collaboration between state institutions, digital platforms, and civil society organisations. Leading technology companies, including Meta Platforms, Google, and X, play a key role in content moderation, increasing transparency in advertising, and reducing the spread of false information. Higher education institutions contribute to building media literacy and digital competencies, conducting research, and developing educational programs to foster critical thinking. Civil society organisations provide independent monitoring of the information environment and run awareness-raising initiatives. State authorities, including the European External Action Service, coordinate anti-disinformation policies and analyse external information influences. The EU experience demonstrates the effectiveness of an integrated, cross-sectoral approach to countering digital manipulation, which can be adapted in Ukraine to strengthen information security and develop a resilient digital culture.

Keywords: *Digital Manipulation, Disinformation, Media Literacy, European Union, Digital Resilience, Democracy, Digital Policy*

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Territorial and Economic Synergy: Agriculture, Bioeconomy, Sustainability, and Food-Sector Resilience

Bridging EU Agricultural Policy and Farm Financing: The Role of Cooperative Banks in Poland

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Poland

The aim of this paper is to analyse the role of cooperative banks in financing agricultural holdings in Poland in the context of the Common Agricultural Policy (CAP) and instruments implemented by the Agency for Restructuring and Modernisation of Agriculture (ARiMR). The study adopts a literature review approach, analysing scientific publications, legal acts, and institutional materials related to agricultural policy and financial support mechanisms. The paper focuses on the role of cooperative banks as key financial intermediaries between public policy and agricultural producers. While CAP instruments and ARiMR programmes provide financial support, they do not ensure immediate liquidity for investment. In practice, it is the banking sector that supplies capital for agricultural investments, including land purchases, machinery acquisition and infrastructure development. Public support mechanisms, such as interest rate subsidies or capital repayments, reduce the cost of financing rather than replace it. The findings indicate that cooperative banks play a fundamental role in enabling the effective absorption of public funds in agriculture. Their local presence, relational banking model, and experience serving rural clients enable them to provide tailored financial solutions and manage credit risk in a sector characterised by high uncertainty. The paper highlights that EU agricultural policy and national support instruments generate additional demand for external financing, including bridge financing and own contribution requirements. As a result, cooperative banks act as a crucial link connecting public support mechanisms with real investment processes in agriculture. The study contributes to the understanding of the interaction between agricultural policy and the financial system, emphasising that the implementation of CAP objectives depends not only on public transfers but also on the availability of bank financing.

Keywords: Cooperative Banks, Agricultural Finance, Common Agricultural Policy, ARiMR, Rural Development, Public Support Instruments

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Investment Attractiveness of Developing Energy Independence of a Dairy Enterprise

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The importance of achieving energy independence for dairy enterprises is driven by the high energy intensity of production processes, rising tariffs, and instability in energy supply. These factors create risks for competitiveness and financial stability. Implementing alternative energy sources reduces costs, ensures payback on investment in the medium term, enhances resilience to crises, and fosters a positive image of socially responsible business. Energy independence thus emerges as a strategic direction combining economic efficiency with environmental and social responsibility. Using LLC "Dairy Company Galychyna" as an example, this study examines the investment attractiveness of alternative energy sources, particularly solar panels. Key advantages include reducing production costs, increasing resilience to external factors, building a socially responsible image, and attracting green investments and EU grants. Economic payback is crucial. Preliminary calculations show solar and biogas technologies can reduce energy costs by 30–40% and achieve payback in 5–7 years. This opens opportunities for production expansion and innovation. Barriers include high initial capital, the need for state incentives, and the integration of energy solutions into strategic management. The dairy industry plays a vital role in food security and economic development. Modern enterprises consume large amounts of electricity for refrigeration, processing, and packaging. Traditional energy sources raise costs and carbon emissions, affecting sustainability. Transitioning to renewables addresses both economic and ecological concerns. Energy independence also stabilises supply chains. On-site generation mitigates risks of grid failures and price volatility, especially during geopolitical uncertainty. Smart energy management optimises consumption and maximises renewable use. Socially, green technologies improve stakeholder relations, brand loyalty, and employee engagement. Consumers increasingly prefer sustainable products, creating market differentiation. International experience shows that dairy farms with energy-efficiency programs gain competitive advantages. Therefore, energy independence for dairy enterprises, particularly LLC "Dairy Company Galychyna," is a promising investment direction combining efficiency, responsibility, and sustainability.

Keywords: Energy Independence, Investment Attractiveness, Dairy Industry, Alternative Energy, Competitiveness, Investment Payback, Sustainable Development

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Investment Needs for Sustainable Development of the Dairy Sector in the Food Industry

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The European dairy sector is shifting from volume to value, driven by a projected 1% annual contraction in the dairy herd, which is expected to reach 17.4 million cows by 2035. This structural change marks a critical turning point at which continuous herd decline will no longer be offset by productivity gains, resulting in a 0.2% annual decrease in the total milk pool. Strategic investment must therefore focus on innovation to raise average milk yields from 7,759 kg per cow to approximately 8,566 kg by the end of the outlook period. Ensuring the economic viability of the 6.9 million annual work units projected to remain in EU agriculture by 2035 is a human and social imperative. While nominal raw milk prices are expected to remain well above pre-2022 levels, farmers face significant pressure from rising intermediate costs and a 0.6% annual decrease in real factor income. Consequently, investments in the circular economy–specifically manure management–are essential to achieve a projected 8% reduction in methane emissions and a 14% decrease in nitrogen surplus by 2035. This approach transforms environmental stewardship into a source of long-term economic resilience for rural communities. The human dimension is further emphasised by the industry's commitment to nutritional excellence, with per capita dairy consumption expected to grow by 2 kg annually for core commodities as consumers prioritise fortified and functional products. To uphold confidence and ensure stability, the sector is actively broadening its societal impact. A clear demonstration of this commitment was the 2024 Memorandum of Understanding signed with the Ukrainian dairy industry, aimed at fostering market integration and deepening collaboration. Through these deliberate investments, the sector aspires to rekindle the appeal of farming as a profession, securing a socially responsible future where premium nutrition remains within reach and reasonably priced for all European citizens.

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Keywords: *Dairy Sector Transformation, Sustainable Investment, Circular Economy, Methane Emissions Reduction, Productivity Innovation, Rural Economic Resilience, Nutritional Excellence*

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EU Strategies for the Economic, Social, and Environmental Revitalisation of Ecosystems Based on the Bioeconomy

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Sustainable development strategies call for a transition from linear economic models to a closed-loop economy, or circular economy. The circular economic model is based on recycling (renewability). European Union countries and other developed nations have developed and are implementing dual transition strategies – the simultaneous green and digital transformation of society. Achieving this dual transition requires new economic models that ensure the attainment of the Sustainable Development Goals. Effective synergy in the development and implementation of national strategies for the transition (transformation) to new economic models of sustainable development will ensure the development of sustainable value chains and their integration into European ecosystems. The bioeconomy model is based on the sustainable use of renewable biological resources (biomass) in a circular manner through biotechnological processes. More active development of a sustainable bioeconomy will help the EU accelerate progress toward a circular and low-carbon economy. A sustainable circular bioeconomy, an economic model based on circular principles, aims to address food security and the environmental crisis, enhance competitiveness, reduce dependence on non-renewable resources, and ensure the sustainable management of natural resources without slowing economic growth. It is geared toward sustainable, inclusive development, focusing on ecosystem goods and services, and contributes to achieving the Sustainable Development Goals. Looking ahead, the circular bioeconomy is emerging as a new economic paradigm, having previously been merely one tool of the "green economy" in the broad sense. In this paradigm, the bioeconomy is the intrinsic foundation of the circular economy. Together with several other innovative tools of the sustainable development economy, the circular bioeconomy defines a new mission (vision) and objectives.

Keywords: *Economy, Digital Economy, Digital Transformation, Green Transition, Bioeconomy, Sustainable Development*

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Features of Project Activities of Food Industry Enterprises Under War Conditions in Ukraine

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Project activities in Ukraine's food industry have become increasingly important due to rising competition, higher consumer expectations for quality, rapid technological advances, and risks associated with military conflict. Applying a project-based approach allows enterprises to modernise production capacities, introduce innovative technologies, optimise costs, and improve resource management. Successful implementation of these projects relies on internationally recognised project management principles, particularly those outlined in the Project Management Body of Knowledge (PMBOK Guide, 2021). This study aims to identify the key characteristics of project activities in Ukrainian food industry enterprises and to examine the factors influencing the efficiency of sectoral projects under wartime conditions. Project activities involve the creation of unique products, technologies, or organisational solutions while considering specific constraints, including raw material shelf life, sanitary standards, product safety, and potential disruptions caused by the war. Unlike many other industries, food production projects depend heavily on biological and technological factors, requiring rapid operational decision-making.

Key types of projects include:

– Technological line upgrades: replacing outdated equipment with more productive, energy-efficient machinery, often without halting production.

New product development (NPD): developing recipes, conducting technological and sensory tests, designing packaging, and introducing products to the market.

Logistics optimisation: creating efficient supply chains, including cold chain systems and digital warehouse management, while accounting for wartime disruptions.

Quality management systems: developing and certifying food safety management systems in accordance with HACCP and ISO 22000.

The main challenges are the perishable nature of products, strict cold-chain requirements, limited shelf life of raw materials, and the need for continuous quality control. Integrating logistics, production, and monitoring processes ensures efficient resource use, minimises losses and maintains stable product quality even under war conditions.

Keywords: *Project Activity, Food Industry, Project Management, Innovation and Development, Food Logistics, Food Safety, War-Related Risks*

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Methodological Track IV: Innovative Learning Environments and Comparative Models of Digital Education

The Didactic Potential of AI-Based Presentation Generators for Ukrainian Literature Lessons

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The rapid digitalisation of the educational environment demands innovative approaches to the preparation of visual didactic materials. This empirical study, conducted as part of the master's research "Didactic potential of multimedia presentations in Ukrainian literature lessons", explores the capabilities, advantages, and limitations of specialised AI presentation generators (specifically Gamma AI, Chalkie.ai, Canva AI, and Tome) tailored for literature education. The pedagogical focus of the research shifted from manual slide formatting to advanced prompt engineering and rigorous visual fact-checking. By utilising structured prompt models (such as RACCE), clear roles, target audiences (15-16-year-old students), and methodological constraints, the AI systems were designed to visualise complex literary concepts, historical contexts, and character analyses. The comparative analysis revealed distinct functional characteristics of each platform in the context of teaching literature. Gamma AI proved efficient for rapid structuring and automated design generation of overview topics (e.g. literary epochs); however, it frequently overloaded slides with excessive text, requiring significant manual reduction. Chalkie.ai demonstrated exceptional potential to create interactive, visually appealing lessons with gamification elements to assess text comprehension. Meanwhile, Canva AI successfully generated logical sequences, minimalist aesthetics, and professional templates that allowed for easy manual editing, making it ideal for deep comparative character analysis. Tome was highly effective for visual storytelling and for generating conceptual materials with automated illustrations, perfectly suited to the philosophical and psychological depth of 10th-grade literature. The findings demonstrate that

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integrating AI presentation generators fundamentally expands the didactic potential of multimedia presentations in literature lessons. These platforms significantly reduce preparation time and transform the modern teacher into a critical instructional designer focused on literary interpretation and student engagement. Keywords: digital pedagogy, AI presentation generators, Ukrainian literature, 10th grade, didactic potential, visual didactic materials, prompt engineering.

Keywords: *Digital Pedagogy, AI Presentation Generators, Ukrainian Literature, 10th Grade, Didactic Potential, Visual Didactic Materials, Prompt Engineering*

The Use of Artificial Intelligence to Create Multisensory Didactic Materials

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Multisensory learning is an educational approach that engages learners' sensory pathways. In particular, the approach is based on the combined learning models SAVI (somatic, auditory, visual, intellectual) and VAKT (visual, auditory, kinaesthetic, tactile), which emphasise that effective learning requires the simultaneous activation of multiple sensory and cognitive channels, as well as high-quality didactic materials to support these processes. Today, the rapid development of artificial intelligence (AI) offers educators high-quality tools for the effective design and creation of these important didactic materials.

Modern AI models allow educators to create highly specific visual content. In addition, AI-based generation, including advanced platforms such as Gemini, can create clear, context-relevant sound effects, such as the jingle of keys, specific environmental noises, or targeted audio cues. By organising these AI tools into a structured matrix, educators can systematically match specific AI features to targeted sensory learning objectives, providing the precise visual and auditory stimuli needed for different learning styles.

However, today's technological landscape has clear limitations. While AI is great at generating highly accurate visual and auditory stimuli, it cannot yet create tactile (touch) or olfactory (smell) materials. While virtual reality (VR) holds promise for fully immersive, multisensory education, these advanced systems remain unavailable in standard learning environments. Consequently, today's educators must rely on sophisticated AI-generated audio and video materials to simulate immersive learning environments. By properly leveraging AI to create dynamic audio-visual materials, teachers can significantly enhance multisensory learning experiences, making education more inclusive, engaging, and effective for diverse learners.

Keywords: *Didactic, Multisensory Channels, AI Models, VAKT, SAVI*

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Plein-Air Practice in the System of Training Future Architects: Integration of Traditional Drawing, Digital Technologies, and AI Visualisation in the Context of Modern European Educational Strategies

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In the context of the digital transformation of higher education, the modernisation of methodological approaches to the professional training of future architects has become increasingly important. Plein-air practice remains a significant component of architectural education, as it fosters direct observation, spatial thinking, compositional analysis, and the professional perception of the architectural environment. At the same time, the contemporary European educational space calls for integrating traditional artistic methods with digital technologies and artificial intelligence tools.

This paper aims to substantiate the methodological value of integrating academic observational drawing, digital graphic tools, and AI-assisted visualisation into the structure of plein-air practice for architecture students. Plein-air practice is conceptualised as a multi-level educational and creative environment in which drawing from life serves as a foundational stage in the development of professional vision. Academic drawing enhances observation, constructive thinking, and the analytical understanding of form and space.

The subsequent use of digital graphic tools deepens compositional analysis, expands the range of visual and colour solutions, and improves the quality of representation. AI-assisted visualisation is considered an innovative methodological resource that enables stylistic experimentation, the modelling of alternative architectural solutions, and comparative visual analysis. The proposed approach combines traditional and digital practices and aligns with the principles of interdisciplinarity, innovation, and competence-based learning characteristic of current European educational strategies.

The paper argues that integrating observational drawing, digital technologies, and AI visualisation into plein-air practice is both methodologically justified and pedagogically effective. Such integration contributes to the development of complex professional competencies in future architects and aligns with current trends in the European educational space, particularly digitalisation, adaptability, and interdisciplinary synergy.

Keywords: *Plein-Air Practice, Architectural Education, Observational Drawing, Digital Technologies, AI-Assisted Visualisation, Teaching Methodology, European Educational Space*

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The Use of Virtual Tours in the Professional Training of Higher Education Students

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One of the promising areas of modern higher education is the use of virtual tours based on information and communication technologies. Virtual tours are traditionally viewed as an effective means of implementing the principle of visual learning in the educational process. The tour helps students form a comprehensive understanding of real-world objects and phenomena through direct perception. The integration of virtual tours into the educational process at higher education institutions plays a particularly important role, as it allows students to simulate and observe pedagogical processes in real-time and in a real-world environment. A virtual field trip is viewed as an interactive form of learning that involves modelling real objects and processes using digital resources (photos, videos, 3D panoramas, geographic information systems, etc.). The use of digital technologies in education expands the educational environment, provides access to diverse information sources, and creates conditions for the individualisation of learning activities. An important characteristic of a field trip is its integrative nature. It combines elements of various teaching methods–explanatory-illustrative, research-based, and problem-based–and facilitates the establishment of interdisciplinary connections. Virtual tours help realise the principle of educational accessibility, as they enable people to explore sites that are remote or otherwise inaccessible to a physical visit. At the same time, virtual tours cannot fully replace traditional ones, as they do not provide the full range of sensory experiences. However, their use is appropriate as a supplement to face-to-face teaching, particularly when real-life excursions are impossible. The variety of excursion types and forms allows for their effective use in the educational process, ensuring the development of in-depth, systematic knowledge, practical skills, and students' cognitive activity. The situation regarding the use of virtual excursions in the educational process at higher education institutions in Ukraine is characterised by both certain successes and uneven implementation, which is linked to the level of technical equipment at higher education institutions, security requirements, and the level of preparation of lecturers for the use of virtual excursions in the educational process. At the same time, the study confirms demand for virtual tours among both students and lecturers.

Keywords: *Mode of Study, Virtual Tour, Information and Communication Technologies, Digital Resources*

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Digital Didactics of Trauma-Sensitive Teaching in War-Affected Educational Contexts

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In the context of ongoing war, the number of vulnerable categories of university students has significantly increased, particularly among those studying remotely in HEIs located in frontline communities, displaced institutions, and students who have become internally displaced persons relocating to safer regions. Under such conditions, many learners are engaged in distance education while simultaneously coping with traumatic experiences, heightened stress, and various psychological and socio-economic challenges. This situation necessitates the transformation of traditional teaching approaches toward more supportive, flexible, and student-centred models. Digital didactics, grounded in trauma-sensitive teaching, offer an effective framework for addressing these challenges and providing meaningful academic and emotional support. Digital didactics of trauma-sensitive teaching integrates trauma-informed principles (safety, trustworthiness, choice, collaboration, empowerment, etc.) into online learning environments. It combines pedagogical strategies with digital technologies to foster students' resilience, emotional regulation, and sustained academic engagement, especially in contexts where face-to-face interaction is limited or disrupted. Key strategies include establishing structured and predictable learning environments through clear schedules and consistent expectations, which help reduce anxiety. Transparency and the provision of choice, e.g. synchronous and asynchronous learning options, enhance students' sense of control and agency. Active engagement approaches, emphasising student participation over passive instruction, further support meaningful learning experiences. Digital tools play a crucial role in implementing trauma-sensitive practices. Interactive technologies, such as anonymous polls, collaborative platforms, and digital reflective journals, enable students to express themselves in psychologically safe ways. Additionally, virtual safe spaces and small-group discussions support social-emotional development, while mindfulness applications contribute to self-regulation. An essential component of effective implementation is teacher professional development, which equips educators with the competencies necessary to design and facilitate trauma-sensitive digital learning environments. Flexible training models, including open online courses and hybrid formats, ensure accessibility and scalability.

Keywords: *Digital Didactics, Trauma-Sensitive Teaching, Digital Learning Environment, Distance Education*

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Implementing EU Social Synergy Priorities in Polish Higher Education: Comparative Insights from China's Digital Education Governance

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This paper examines how selected priorities of the European Union's digital education agenda may be translated into institutional practice in Polish higher education by comparing China's digital education governance experience. Positioned within the broader framework of Digital European Studies, the study focuses on the implementation logic of the EU Digital Education Action Plan (2021–2027) and related priorities concerning inclusion, digital capacity, lifelong learning, and the modernisation of higher education.

Methodologically, the paper is based on comparative policy analysis and systematic reading of official policy documents. It contrasts the EU's strategic emphasis on inclusive, high-quality, and future-oriented digital education with China's large-scale governance approach to blended and online learning in higher education. The comparison is not intended to transfer one model directly to another context, but to identify implementation mechanisms, institutional lessons, and structural risks relevant to Polish higher education institutions.

The analysis produces two main findings. First, China's experience demonstrates the importance of coordinated digital infrastructure, platform-based educational support, and strong policy-to-institution linkages in scaling digital higher education. Second, it also reveals structural tensions typical of top-down reform, including the possible gap between strategic policy design and local pedagogical innovation, as well as persistent inequalities in digital competence and institutional readiness. These findings suggest that the effective implementation of EU social synergy priorities in Polish higher education requires not only digital tools and policy alignment, but also sustained institutional support, teacher preparedness, and context-sensitive governance.

The paper concludes that comparative engagement with non-European governance models can strengthen the methodological and policy-oriented scope of Digital European Studies. In the Polish context, the implementation of EU digital education priorities is likely to be most effective when it combines strategic coordination with institutional flexibility, pedagogical autonomy, and inclusive capacity-building.

***Keywords**: Digital European Studies, EU Digital Education Policy, Polish Higher Education, Comparative Policy Analysis, Blended Learning, Digital Governance, Lifelong Learning*

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Social Synergy I:
Digital Citizenship, Data Ethics, Trust, and Public Responsibility

Digital Inclusion as a Factor of Social Synergy

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The digital transformation of modern society presents the EU with complex challenges in maintaining social cohesion. Research into the concept of "social synergy" goes beyond simple technical literacy, becoming a tool for both democratisation and crisis management. A special place in this analysis is occupied by Ukraine's experience during the full-scale war. Russian aggression has served as an unprecedented stress test, proving that digitalisation is a critical factor for survival and national mobilisation. The Ukrainian experience of integrating government services (e.g., the Diia platform) into a digital ecosystem has demonstrated how technologies can ensure the continuity of governance even under critical conditions. An important component of this transformation has been the phenomenon of digital volunteering. Amidst the war, Ukrainian civil society has transformed into a flexible, distributed network structure. Digital platforms have become the foundation for coordinating the efforts of millions of people, from fundraising for defence needs to the logistics of humanitarian aid. This is a real-world example of social synergy, where individual efforts, amplified by digital tools, create qualitatively new social value. An analysis of EU initiatives, such as digital Europe, shows that successful social synergy is only possible through a human-centric approach. Technologies should not merely automate processes; they must stimulate civic engagement. The study emphasises that the role of non-governmental organisations in this process is decisive, as they act as intermediaries between technological capabilities and the needs of vulnerable population groups. Consequently, building synergy in society depends on the ability of EU institutions and member states to balance innovation with the protection of social rights. Ukraine's experience demonstrates that when digitalisation is combined with a high level of horizontal trust and grassroots volunteering, it becomes a powerful shield for democracy. Therefore, future European digitalisation policy must integrate these lessons to support the development of inclusive digital communities, thereby guaranteeing resilience against future challenges.

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Keywords: *Digital Inclusion, Social Synergy, Digital Volunteering, Social Resilience, European Integration, Digital Society*

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Ethics of Data Use: Balancing Transparency, Innovation and Privacy

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The rapid development of digital technologies has transformed data into a key resource for modern public institutions. Governments and international organisations increasingly rely on data to design public policies, monitor economic trends, and analyse social processes. While data-driven governance can improve the effectiveness of public administration, it also raises important ethical challenges.

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This presentation examines the ethical aspects of public data use, focusing on core principles such as privacy, transparency, fairness, and accountability. Particular attention is given to the concept of open data, which promotes the public availability of government-generated datasets to increase transparency and stimulate innovation.

In the European context, ethical data use is closely linked to legal frameworks such as the General Data Protection Regulation (GDPR), which establishes rules for the collection and processing of personal data. The presentation also discusses potential risks related to data governance, including the re-identification of anonymised data, algorithmic bias, and the use of data for profiling.

The case of Cambridge Analytica is briefly discussed as an example illustrating the ethical risks associated with large-scale data collection and analysis.

Keywords: *Data Ethics, Public Data, Open Data, Privacy Protection, Data Governance, GDPR, Digital Policy*

Open Data, Transparency, and Data Governance in EU Institutions: Building a Trust-Based Digital Society

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This paper examines the pivotal role of Open Data in enhancing transparency, accountability, and innovation within the European Union's public sector. Open Data is defined as publicly produced datasets provided free of charge in machine-readable formats under open licenses, enabling social oversight and evidence-based benchmarking. The research analyses Open Data as a robust anti-corruption tool that facilitates scrutiny of public procurement, beneficial ownership, and lobbying registers. Through case studies of platforms such as data.europa.eu and national registries in Italy, France, and Poland, the study demonstrates how high-quality data governed by frameworks like DCAT-AP and the Data Governance Act strengthens the digital relationship between the state and its citizens. Furthermore, the work explores the intersection of data governance and emerging technologies, emphasising the need for algorithmic transparency and the ethical deployment of AI in line with the AI Act 2024. By evaluating the impact of Open Data during crises, such as the COVID-19 pandemic, the paper highlights its critical value for rapid decision-making and public health protection. The findings provide a strategic framework for implementing "API-first" administration and the "Once Only" principle to foster a resilient, transparent, and innovative European digital ecosystem.

Keywords: *Open Data, Transparency, Data Governance, Anti-Corruption, Public Sector Accountability, EU Data Act*

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The Impact of Social Media on Adolescent Behaviour

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In the digital age, social media has become an integral part of young people's daily lives, significantly influencing their behaviour, communication patterns, and psychological well-being. Teenagers are among the most active users of these platforms, which function both as tools of communication and as environments for identity formation and social interaction. This study focuses on adolescents' passive use of social media, that is, viewing content without actively interacting with it.

Excessive consumption of social media content has been linked to negative behavioural outcomes. Research shows that frequent exposure to idealised online images can encourage adolescents to compare themselves with others, resulting in reduced self-esteem and increased anxiety. Adolescents often encounter images of peers who appear more successful, more attractive, and more socially active, which may contribute to low self-esteem and symptoms of depression. Excessive content consumption may also negatively affect emotional well-being, including sleep patterns, concentration, social skills, mood stability, and academic performance.

The online environment also alters interpersonal relationships by reshaping communication styles and reducing face-to-face interaction. In addition, online anonymity can intensify cyberbullying by weakening the perpetrator's sense of accountability and awareness of the harm caused. Peer pressure in digital environments may also directly influence adolescent behaviour and emotional stability.

The findings suggest that passive social media use is associated with stronger social comparison and may negatively affect adolescents' self-esteem and emotional well-being. The nature of this influence depends not only on the amount of time spent on social media but also on the way users engage with content. These observations highlight the need to develop skills for the mindful use of digital platforms and to foster critical thinking among adolescents.

Keywords: Social Media, Adolescents, Passive Use, Self-Esteem, Social Comparison, Mental Well-Being

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Artificial Intelligence in Political Consultancy in EU Countries: Striking a Balance Between Technological Synergy and Ethical Risks

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Within the Digital Europe strategy, inter-institutional synergy among universities, research centres, business, and public administration is pivotal to the implementation of AI and Big Data in EU digital ecosystems. According to Regulation (EU) 2024/1689 (the AI Act), AI systems used in political consulting to influence electoral behaviour may qualify as high-risk under Article 6 and Annex III, depending on their purpose and impact. Related risks, including disinformation and privacy concerns, should be assessed in conjunction with the GDPR, notably Articles 5, 6, and 22, as well as Article 9, which applies to special categories of data. In line with the concept of human-centric AI, the AI Act establishes requirements for high-risk systems, including data governance (Article 10), transparency (Article 13), human oversight (Article 14), and accuracy (Article 15). This ethical framework constitutes a distinguishing feature of the European digital model. A discourse-oriented reading of Regulation (EU) 2024/1689 enables the authors to identify key areas of interpretative uncertainty in the use of AI in political consulting: (1) content labelling and exceptions; (2) microtargeting and behavioural influence; (3) the qualification of political consulting systems as high-risk; (4) coordinated inauthentic behaviour and "astroturfing"; and (5) algorithmic mediation and covert influence. The analysis suggests that, although the AI Act establishes a risk-based framework for AI in political contexts, its application to political consulting remains partly interpretative, particularly regarding content labelling, microtargeting, high-risk classification, and platform-mediated influence. These uncertainties indicate the need for further clarification and consistent enforcement, especially in cases involving astroturfing and algorithmic mediation.

Keywords: *Artificial Intelligence, Political Consulting, EU AI Act, Digital Ecosystems, Big Data Ethics, Higher Education Synergy*

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Methodological Track V:
Early Education, Emotional Development, and Community-Oriented Learning

Literary Reading as a Space for the Development of Emotional Intelligence in Primary School Students

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The development of emotional intelligence is one of the key tasks of modern education, ensuring a child's successful socialisation, capacity for self-realisation, effective communication, and the building of harmonious relationships with others. A content analysis of emotional intelligence characteristics reveals it as the ability to understand, be aware of, and manage one's own emotions, as well as the emotional states of others. This includes recognising their needs, empathising, developing positive personality traits, and regulating thoughts, behaviour, and emotional states.

The preschool years are a sensitive period for the development of emotional competence. During this time, core components of emotional intelligence–such as emotional awareness, self-regulation, empathy, and social interaction–develop, significantly influencing a child's future personal growth.

Literary reading lessons are crucial for fostering emotional intelligence. Engaging with literary texts allows students to delve deeply into the realm of human feelings, analyse their actions and articulate their attitude toward events. Such engagement nurtures empathy, moral values, and critical thinking.

An essential aspect of developing emotional intelligence is cultivating skills in reflection, self-expression, and emotional awareness. Through discussions, creative tasks, and dialogues, children learn to express their opinions, listen to others, and connect their personal experiences to those of literary characters.

Literary works provide an effective means of understanding life situations through accessible imagery. Interactive methods, game-based technologies, and elements of art therapy enhance student engagement and promote the development of emotional and communication skills.

When analysing literary texts, it is important to focus on the semantic meanings of linguistic units, thereby enriching students' vocabulary through a cognitive methodology. Furthermore, language serves as a vital link to other human activities, providing insights into human behaviour.

In conclusion, literary reading serves as a potent educational space for developing emotional intelligence in primary school students. It effectively integrates cognitive and emotional learning components.

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Keywords: Emotional Intelligence, Primary School Students, Literary Reading, Empathy, Educational Process

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Modern Approaches to the Formation of Communicative Competence in Early Preschool Children

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The communicative development of children of early preschool age is an important component of their overall development, as it ensures socialisation and interaction with the environment. A child's ability to communicate and understand others is becoming increasingly important. The formation of communicative skills is especially relevant in early childhood. An important role is played by the educational environment of a preschool institution in developing speech and creating conditions for communication. The aim of the article is to analyse modern approaches to the development of children's communicative competence in early preschool age and to identify effective methods for developing speech and communicative skills. The speech development of preschool children is one of the leading areas of modern linguodidactics. Its scientific foundations were substantiated by F. Sokhin and further developed in Ukraine under the guidance of A. Bogush. The formation of communicative competence begins with acquiring skills of establishing contact and observing speech etiquette. In the process of communication, the child imitates adult speech and develops their own speech behaviour, thereby contributing to the development of a linguistic personality. An important factor in the development of communicative skills is the creation of a favourable speech environment. Play activity plays a significant role in this process. Through play, children acquire language structures, expand their vocabulary, and develop dialogic speech. Role-playing games, such as "Shop" or "Hospital," allow modelling real-life situations and contribute to speech development. The use of interactive technologies, including multimedia tools, interactive books, and mobile applications, develops attention, memory, and thinking, and enhances communicative interaction. Interactive stories encourage retelling, discussion, and expression of personal opinions. Communicative competence ensures the ability to interact effectively, construct coherent statements, and

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develop social speech, which includes expressing one's position and self-presentation. The method of modelling communicative situations helps children learn to express emotions, negotiate, and maintain dialogue. Psychological and pedagogical support, as well as cooperation between educators and parents, are important. Thus, the use of modern approaches, including play-based activity, interactive technologies, and modelling of communicative situations, promotes the development of speech and communication skills. The creation of a supportive speech environment and cooperation between educators and parents play an important role.

Keywords: Communicative Development, Preschool Age, Language Competence, Speech Development, Communication, Play-Based Activity, Interactive Methods, Socialisation, Preschool Education

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Formation of Environmental Culture in Preschool Children Through Play-Based, Inquiry-Based, and Nature-Based Activities

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The formation of environmental awareness in preschool children is a priority task in modern education, as the foundations of a careful attitude toward nature are laid at an early age. As noted by Bondarevska, environmental culture is formed through a combination of knowledge, emotions, and practical activity. Environmental education in preschool institutions should combine theoretical knowledge and practical experience, which involves the child's direct interaction with nature. Verbytska emphasises the importance of active learning methods and involving children in environmental protection activities. The use of play, experiments, and project-based activities helps explore the environment and form an emotional connection with nature. Ilyin emphasises that a child's environmental awareness is formed through personal experience. The aim of the article is to analyse modern approaches to environmental education for pre-schoolers that foster a responsible attitude toward nature and develop practical skills for its preservation. Play activity is an effective means of environmental

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education, as children acquire knowledge and shape behaviour through play. According to O. Melnyk, play promotes the development of environmental thinking. Story-role-playing games, for example, "Young Ecologists" or "Defenders of Nature," help model environmentally appropriate situations. Research activity develops cognitive engagement. Conducting experiments with water, air, and soil allows children to discover natural patterns. I. Rudenko notes that research-based methods are the most effective. Environmental quests combine play, learning, and exploration, for example, using QR codes. Activities in nature and "green classrooms" provide direct contact with the environment. Implementing environmental projects, such as waste sorting, develops practical skills. Involving families is also important, as it helps reinforce ecological habits. Thus, a comprehensive approach to environmental education fosters an environmental culture and a conscious attitude toward the environment.

Keywords: Environmental Culture, Preschool Education, Environment, Ecological Awareness, Play, Research Activity, STEM, Eco-Projects, Ecological Trail

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Military-Patriotic Education of Youth in Extracurricular Educational Institutions as a Manifestation of Social Synergy in the Context of European Educational and Digital Policy

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Military-patriotic education can be defined as a multi-level pedagogical system aimed at fostering national identity, civic responsibility, and readiness to defend the state. In contemporary conditions, its effectiveness depends not only on instructional content and methods but also on the quality of inter-institutional interaction, which allows it to be conceptualised as a manifestation of social synergy within the educational ecosystem.

From an analytical perspective, social synergy in this domain is realised through the integration of resources, functions, and strategies of various stakeholders, including extracurricular institutions, higher education institutions, civil society organisations, public

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authorities, and the security sector. Such cooperation aligns with the priorities of European educational policy, particularly cross-sectoral partnerships, lifelong learning, and the development of civic competences.

Extracurricular education provides a practice-oriented environment where students develop applied skills such as leadership, teamwork, and discipline. Simultaneously, higher education institutions provide scientific and methodological support, develop innovative educational models, and train educators. This interaction forms a vertically integrated system, ensuring continuity and coherence of educational influences.

The alignment of these processes with digital transformation is of particular importance. European educational initiatives emphasise digital education and open educational resources as key drivers of innovation. The use of digital platforms, simulations, and virtual environments expands access to military-patriotic education while enhancing its adaptability and personalisation. In this context, higher education institutions function as innovation hubs that design and implement digital solutions within extracurricular settings.

Thus, military-patriotic education in extracurricular institutions should be viewed as a component of a socio-synergistic model operating within a European-oriented educational ecosystem. Its effectiveness is ensured through inter-institutional cooperation, vertical integration of educational levels, and the implementation of digital technologies aligned with European strategies.

Conclusion. Strengthening military-patriotic education requires the systematic application of social synergy principles aligned with European educational and digital policies. The integration of institutional resources, continuity across educational levels, and the use of digital tools contribute to the development of a coherent ecosystem that fosters civic and professional competencies among youth.

Keywords: *Military-Patriotic Education, Social Synergy, Higher Education Ecosystem, European Educational Policy, Digitalization of Education*

Social Synergy II:
Community Support, Entrepreneurship, Health, and Social Resilience

Youth Entrepreneurship as a Driver of Socio-Economic Transformation

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Youth entrepreneurship is increasingly moving beyond the traditional view of business as a means of generating profit. For today's young people, it is a space for self-fulfilment, influence, and rapid adaptation to change. According to international research, around 20–25% of young people worldwide have already started their own business, whilst over 40%

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view entrepreneurship as a desirable career path. This indicates a significant transformation in the economic behaviour of the new generation. A distinctive feature of youth entrepreneurship is the combination of innovation and value-driven orientation. Young entrepreneurs are more likely to integrate the principles of sustainable development, social impact, and digitalisation. For them, business is not just a product, but a solution to a specific problem. At the same time, there is a marked trend towards micro-entrepreneurship: over 60% of youth business initiatives start as small or individual projects, allowing ideas to be tested quickly and risks to be minimised. The digital environment has significantly lowered barriers to entry: launching an online business today often requires far less investment than it did a decade ago. However, young people face the greatest challenges, including limited experience, financial resources, and access to support networks. According to experts, up to 70% of young entrepreneurs require mentoring or educational support during the early stages of business development. In the Ukrainian context, youth entrepreneurship is taking on strategic importance. It not only stimulates the local economy but also fosters a new culture of responsibility and initiative. The development of youth entrepreneurship should be an investment in the long-term sustainability of communities and the economy.

Keywords: *Youth Entrepreneurship, Youth Business, Sustainable Development, Economic Behaviour, Social Impact*

Entrepreneurial Opportunities for IDPs as a Factor in Economic Integration and Recovery

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Entrepreneurial opportunities for internally displaced persons (IDPs) in Ukraine today are emerging at the intersection of forced adaptation and the search for new economic roles. The scale of internal displacement – over 4.5 million people – is transforming not only the labour market but also the very structure of local economies, where IDPs are increasingly acting not as aid recipients but as active economic agents. In this context, entrepreneurship takes on a dual function: on the one hand, it compensates for the loss of traditional employment; on the other, it creates new drivers of economic growth in host communities. At the same time, although around 30–40% of IDPs declare a willingness to start their own business, the actual rate of business start-ups remains significantly lower. This indicates the presence of systemic barriers – limited access to start-up capital, a breakdown in social and professional networks, and institutional uncertainty. A characteristic feature of IDPs' entrepreneurial activity is its high adaptability and flexibility: over 60% of initiatives are implemented as micro-businesses, focused on rapid launch and risk minimisation. At the same time, this format often limits opportunities for scaling up and long-term development. An important factor in

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strengthening IDPs' entrepreneurial potential is the presence of comprehensive support ecosystems. Practice shows that participation in grant, educational, and incubation programmes almost doubles the likelihood of creating a sustainable business, whilst also fostering the development of an entrepreneurial identity. Thus, IDP entrepreneurship should be viewed not merely as a response to the crisis but as a strategic resource for economic recovery, capable of generating a new quality of community development through adaptability, innovation, and social inclusion.

Keywords: *IDP, Entrepreneurship, Entrepreneurial Opportunities, Internal Displacement, Entrepreneurial Identity, Economic Integration*

Standardisation vs. Fragmentation: Systemic Policy Gaps in Lactation Support and Early Developmental Care Across Healthcare Systems

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This paper examines systemic and regulatory gaps in lactation support and early infant developmental assessment and intervention within and across healthcare systems, adopting a comparative perspective encompassing Poland, selected European Union frameworks, and the United States. Despite the recognition of early-life care as a critical component of public health, the integration of lactation support with functional and neurodevelopmental assessment remains limited, inconsistent, and insufficiently structured at the system level. The study analyses the impact of heterogeneous regulatory models, certification pathways, and professional training standards on the accessibility and quality of care. Particular attention is given to the relationship between disorders of muscle tone and postural stability, including infant joint hypermobility, breastfeeding difficulties, motor development, and the attainment of developmental milestones. Despite the documented influence of these factors on feeding outcomes and early intervention processes, they remain inadequately addressed in clinical guidelines, health policy design, and care pathways. Furthermore, the paper explores the consequences of interdisciplinary fragmentation and terminological inconsistency across domains such as physiotherapy, lactation consultancy, speech and language therapy, and paediatrics. The lack of a unified professional language and limited integration of competencies contribute to barriers in interprofessional communication, delays in diagnosis, and suboptimal therapeutic strategies. In the context of European Union strategies aimed at improving healthcare accessibility, standardising education, and fostering integrated models of care, the paper highlights the need to develop coherent competency frameworks, strengthen interdisciplinary training, and harmonise terminology in early childhood care. The

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proposed directions seek to enhance system efficiency, improve the quality of interventions, and reduce inequalities in access to lactation and developmental support.

Keywords: Lactation Support, Early Childhood Development, Healthcare Systems, Policy Gaps, Interdisciplinary Care, Professional Standardisation, EU Health Policy

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Social and Medical Support in Perinatal Care: Implications for Breastfeeding Experiences and Patient-Centered Healthcare Models

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Breastfeeding during the perinatal period is a complex experience shaped not only by biological factors but also by emotional, social, and organisational aspects of care. A woman's well-being after childbirth, as well as the nature and quality of support received from both family members and healthcare professionals, may significantly influence her breastfeeding experience. Understanding these interactions is essential for the development of more responsive and patient-centred perinatal care models. The aim of the study is to analyse the relationships between women's emotional functioning in the postpartum period, the level of social and medical support received, and their subjective evaluation of breastfeeding experiences during perinatal hospitalisation. Additionally, the study considers selected infant-related factors that may co-occur with breastfeeding difficulties, including aspects of early functional development relevant to effective feeding. The study is designed as a non-interventional, observational project. It will include adult women who initiate breastfeeding during hospital stay and, in an extended phase, mother–infant dyads followed beyond the hospital setting. Standardised assessment tools will be used to evaluate psychological well-being, perceived stress, anxiety, depressive symptoms, breastfeeding self-efficacy, and satisfaction with care. These measures will be complemented by a perinatal background questionnaire and a brief, non-invasive observation of selected aspects of infant functioning associated with effective sucking. It is hypothesised that higher levels of social and medical support, as well as better emotional functioning, will be associated with more positive breastfeeding experiences, greater self-efficacy, and fewer reported difficulties. The findings may inform the development of more integrated, patient-centred perinatal care models and contribute to ongoing discussions on improving support systems in line with European public health priorities.

Keywords: Breastfeeding, Perinatal Care, Social Support, Healthcare Support, Maternal Mental Health, Patient-Centred Care, Early Childhood Development

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Applied Methodologies, Sectoral Innovation, and Risk Assessment

Jean-Marie Dru's Theory of Breaking Stereotypes as a Strategy for Creative Marketing in Competitive Brand Ecosystems

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Competition in most markets necessitates the use of creative marketing and advertising techniques to achieve effective branding. Stereotypes in marketing limit new perspectives and eventually cease to work. Jean-Marie Dru proposes an alternative approach to creating creative solutions in advertising and marketing: the theory of breaking stereotypes. According to this theory, a brand becomes strong and distinctive when it consciously breaks established stereotypes rather than reproducing them. Applying Jean-Marie Dru's theory involves three sequential stages. 1. Diagnosing stereotypes: identifying the audience's established perceptions of a product or category. 2. Disruption: deliberately subverting expectations through an unexpected image, a different narrative logic, or an atypical brand role. It is important to note that disruption is not shock for the sake of attention, but a meaningful shift in perception. 3. Vision: shaping a new perception of the category and a new role for the brand in the consumer's life. One successful example of applying this theory is the "Snickers" brand marketing campaign. Previously, before the brand was repositioned, the advertising communications focused on strong men who needed a bar to recharge. The narrow target audience and the use of classic stereotypes led to a rapid decline in the effectiveness of such advertising. There was a need to change the approach to brand positioning. The new positioning was that hunger causes a person to "lose themselves," their typical traits. Breaking the stereotype by portraying atypical human behaviour in a specific situation formed the basis of the new brand positioning strategy in the marketing campaign "You're not you when you're hungry". This was complemented by a touch of humour in the advertising, which together brought the brand to a new level of popularity.

Keywords: Marketing Creativity, Breaking Stereotypes, Jean-Marie Dru's Theory, Brand Positioning, Advertising Campaign, Marketing Communications, Creative Thinking

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Managerial Aspects of Project Team Formation in Food Production

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The formation of a project team in the food industry is a complex managerial process that combines the selection of qualified specialists with the organisation of their effective interaction under strict requirements for product quality and safety. Unlike general approaches to team building, this sector emphasises cross-functional coordination, prompt decision-making, and consideration of technological and regulatory constraints. Empirical evidence suggests that the effectiveness of project teams in developing new food products depends on the timely involvement of specialists from different functional areas. For instance, while a technologist may ensure high organoleptic characteristics of a dairy product, the absence of procurement expertise can lead to cost overruns. Integrating technological and economic perspectives at early project stages helps prevent adjustments to the formulation and reduces resource consumption. Thus, interdisciplinarity serves both as an organisational necessity and a tool for improving project outcomes. The implementation of food safety management systems demonstrates that formally established teams do not always ensure effective change. When production-level employees are excluded, resistance to innovation and superficial compliance often occur. Including informal leaders and experienced operators promotes trust and supports the practical integration of standards into daily operations, highlighting the importance of socio-psychological factors. Optimisation initiatives further confirm the value of practical experience. Engineering solutions that ignore real production conditions are often ineffective. Involving operators helps identify hidden inefficiencies and develop realistic approaches to improving productivity. Compliance with regulatory requirements is also critical, especially when entering new markets. Early involvement of certification experts ensures conformity and minimises risks. Consequently, effective project teams integrate diverse knowledge, adapt to change, and ensure the successful implementation of decisions.

Keywords: Project Team, Food Industry, Teamwork, Safety, Experience, Regulations

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Methodological Approaches to Genetic Evaluation of Dairy Cattle Productivity in the Context of Digital European Studies

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Modern agricultural research is increasingly influenced by European integration and digital transformation. This study presents a methodological approach to the selection and genetic evaluation of productive traits in Holstein cows of domestic and Danish origin.

The research uses statistical methods, including comparative and variance analyses, to evaluate key indicators such as milk yield, reproductive performance, and adaptability. In addition, digital tools for data collection and processing are considered an important part of modern breeding research.

Special attention is given to the use of herd management systems and digital databases, which support more accurate and efficient analysis. These tools are widely used in European agricultural research and help improve the quality and transparency of genetic evaluation.

The proposed methodological approach highlights the importance of combining traditional breeding methods with modern digital technologies. This combination allows for more reliable results and better decision-making in dairy cattle breeding.

Overall, the study shows that integrating digital methods into genetic evaluation is an important step toward aligning national research practices with European standards and strengthening cooperation in the agricultural sector.

Keywords: *Dairy Cattle, Genetic Evaluation, Holstein Breed, Digital Agriculture, Breeding Methodology, Data Analysis, EU Integration*

Counterparty Risk Assessment in the Enterprise's Procurement Activities: Methodological Approaches and Problems of Practical Application

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Currently, the procurement function is considered a strategic function that impacts value creation, EBITDA, business continuity and risk minimisation. In practice, procurement is the first line of defence against risk. Most risks can be identified during supplier sourcing and evaluation, helping prevent losses. According to KPMG, more than 75% of companies consider supplier risk management as a strategic priority; however, about 70% recognize the

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ineffectiveness of existing approaches. Supplier assessment approaches can be grouped into several categories. The first group comprises quantitative methods based on financial indicators. Such indicators include liquidity, profitability, financial stability, and business activity ratios. The advantage of these methods is objectivity and the ability to compare different counterparties. At the same time, their disadvantage is limitation, as financial reports don't always reflect the real state of the company. The second group is qualitative approaches based on expert assessment. It focused on business reputation, work experience, product quality, service level, and flexibility. The advantage is the ability to account for intangible factors, but a significant disadvantage is the assessment's subjectivity. The third group is the combined methods that combine both indicators. The most common are point-assessment systems, in which each criterion has a specific weight. This approach allows you to get an integral assessment of the counterparty, but it requires a clear methodology and standardisation. A separate group comprises digital and automated counterparty assessment systems that use large datasets and analytical algorithms. It allows you to quickly obtain information about the counterparty, but its effectiveness depends on the quality of the available data. Thus, none of the existing approaches provides all three: ease of use, comprehensive assessment, and adaptation to the conditions of a particular enterprise. While the scientific literature offers complex assessment models, enterprises use simplified tools in practice.

Keywords: *Risk Management, Counterparty Risks, Purchasing Activities, Supplier Assessment, Supply Chain, Strategic Procurement*

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Page Index of Abstracts

Chapter 1. ROAD2EU, Academic Synergy, and Responsible Digital Transformation

Economic Synergy I: Data, ESG, and Innovation Governance

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Methodological Track I: Foundations of Digital European Studies

Economic Synergy II: Trade, Enterprise Adaptation, Finance, and Digital Transformation

Methodological Track II: Digital Pedagogy in Teacher and Language Education

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Economic and Organisational Transformation: HR, Communication, and Workplace Adaptation

Methodological Track III: AI, Assessment, and Legal-Ethical Transformation in Education

Funded by the European Union

Volume 2. Human-Centred AI, European Resilience and Crisis Preparedness

Territorial and Economic Synergy: Agriculture, Bioeconomy, Sustainability, and Food-Sector Resilience

Methodological Track IV: Innovative Learning Environments and Comparative Models of Digital Education

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Social Synergy I: Digital Citizenship, Data Ethics, Trust, and Public Responsibility

Methodological Track V: Early Education, Emotional Development, and Community-Oriented Learning

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Social Synergy II: Community Support, Entrepreneurship, Health, and Social Resilience

Applied Methodologies, Sectoral Innovation, and Risk Assessment

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