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V.V. OSADCHYI,
Doctor of Sciences in Pedagogy, Full Professor,
Correspondent member of the Academy of Educational Sciences of Ukraine,
Boris Grinchenko Kyiv Metropolitan University (Kyiv, Ukraine),
Leading Researcher, Institute for Digitalization of Education of the National Academy of Educational Sciences of Ukraine (Kyiv, Ukraine)
https://orcid.org/0000-0001-5659-4774

M.P. PAVLENKO,
PhD in Pedagogy, Associate Professor,
Department of Computer Technologies and Informatics,
Berdyansk State Pedagogical University (Zaporizhzhya, Ukraine)
https://orcid.org/0000-0003-0091-696X

L.V. PAVLENKO,
PhD in Pedagogy, Associate Professor,
Department of Computer Technologies and Informatics,
Berdyansk State Pedagogical University (Zaporizhzhya, Ukraine)
https://orcid.org/0000-0001-7823-7399

O.V. SYSOIEV,
Dr. hab., Doctor of Social Sciences in the Discipline of Economics and Finance,
The Mazovian University in Płock (Plock, Poland)
https://orcid.org/0000-0001-5899-0244

V.S. KRUGLYK,
Doctor of Sciences in Pedagogy, Full Professor,
Department of Informatics and Cybernetics,
Bohdan Khmelnytsky Melitopol State Pedagogical University (Zaporizhzhia, Ukraine)
https://orcid.org/0000-0002-5196-7241

THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE DEVELOPMENT OF PREDICTIVE COMPETENCE IN MODERN SPECIALISTS

Актуальність дослідження зумовлена стрімким розвитком штучного інтелекту (ШІ), зокрема великих мовних моделей і генеративних технологій, які докорінно трансформують професійну діяльність сучасної людини. Ці зміни істотно впливають на формування прогностичної компетенції – ключової здатності до обґрунтованого передбачення та ухвалення рішень в умовах невизначеності. Емпіричні дані свідчать про високу прогностичну точність ШІ, яка в окремих випадках перевищує людську, а також про значне зростання продуктивності фахівців за його використанні. Водночас спостерігають різні патерни адаптації до ШІ, що актуалізує необхідність переосмислення ролі людського судження, а також породжує ризики: залежності від ШІ, упередженості алгоритмів, обмеження доступу до технологій. Ці виклики потребують трансформації освітніх підходів з акцентом на розвиток критичного мислення та формування навичок ефективної взаємодії з інтелектуальними системами.

Метою дослідження є комплексний аналіз і теоретичне обґрунтування впливу сучасних ШІ-технологій, зокрема великих мовних моделей і генеративного ШІ, на формування, розвиток і трансформацію прогностичної компетенції сучасного фахівця.

Результати дослідження свідчать, що використання ШІ значною мірою підвищує ефективність процесів прогнозування. Водночас відбувається глибока трансформація самої прогностичної компетенції: від самостійного створення прогнозів – до управління гібридними людино-машинними системами. Це вимагає від фахівця нових навичок: критичної оцінки результатів, отриманих за допомогою ШІ, їхньої валідації, опанування промпт-інжинірингу й інтеграції машинного аналізу в процес ухвалення рішень. Найсуттєвіші зміни спостерігаються у когнітивному, регулятивному та комунікативному компонентах компетенції. Установлено, що вплив ШІ є діалектичним, оскільки поєднує розширені аналітичні можливості з ризиками помилкових узагальнень («галюцинацій»), когнітивної інерції, упередженості та зростання цифрової нерівності. При цьому професійна роль фахівця еволюціонує – від виконавця до модератора, валідатора та етичного регулятора прогнозних процесів.

Дослідження обґрунтовує нагальну потребу адаптації освітніх програм для формування ШІ-грамотності, навичок критичного мислення та етичної взаємодії з інтелектуальними системами задля успішної професійної діяльності в нових умовах.

***Ключові слова**: прогностична компетенція, штучний інтелект (ШІ), великі мовні моделі (LLM), генеративний ШІ, професійний розвиток, вища освіта, когнітивні процеси, взаємодія людина-ШІ / людино-машинна взаємодія, трансформація навичок, критичне мислення*

Problem statement. The rapid development of artificial intelligence (AI), in particular large language models (LLM) and generative AI, is fundamentally changing the nature of professional activity in various industries. Of particular note is the impact of these technologies on the development of predictive competence of specialists – the ability to make accurate predictions and take informed decisions in a professional context. The relevance of research on this topic is due to a number of interrelated factors.

Existing empirical studies show that modern AI systems demonstrate impressive accuracy in solving predictive tasks, sometimes outperforming human experts. For example, in the behavioural sciences, GPT-4 achieves a prediction correlation of 0.89 compared to 0.87 for human experts [Lippert et al., 2024]. In neuroscience, prediction accuracy rates increased from 63.4% for experts to 81.4% with AI support [Luo et al., 2024]. These data indicate the significant potential of AI as a tool for expanding the predictive capabilities of specialists.

Analysis of the latest research and publications. Studies show significant improvements in the productivity and quality of work of specialists when using AI systems. Empirical studies show an increase in efficiency from 14% to 40% depending on the field of activity and the context of application [Brynjolfsson, Li, Raymond, 2023; Dell'Acqua et al., 2023; Noy, Zhang, 2023]. Importantly, these improvements relate not only to quantitative but also to qualitative aspects of work, including the ability to predict and make decisions.

There are various patterns of adaptation and integration of AI into professional activities, which directly affects the development of predictive competence. [Dell'Acqua et al., 2023] identified two main approaches to human-AI collaboration: "Centaur" (the selective use of AI for specific tasks with control of the overall process) and "Cyborg" (a more integrated model with constant interaction with AI throughout the workflow). These interaction models can have different effects on the development of predictive skills of specialists.

The emergence of AI is changing the very nature of professional roles and the competencies required. Professionals are increasingly focusing on tasks that require human judgment, creativity, and complex thinking, delegating routine tasks to AI systems. This requires the development of new competencies, such as the ability to effectively interact with AI, critically evaluate its recommendations, and integrate them into professional activities.

The use of AI systems in a professional context is associated with certain risks and challenges that need to be considered. These include the risks of over-reliance on AI, the potential atrophy of certain professional skills, issues of privacy and data security, bias, and fairness [Walkowiak, MacDonald, 2023]. Developing strategies to minimize these risks is critical for the effective use of AI to develop predictive competence.

The issue of inequality in access to and use of AI in professional contexts deserves special attention. Research shows that less experienced workers often benefit more from the integration of AI than their more senior colleagues, which can change the dynamics of professional development and career growth [Brynjolfsson, Li, Raymond, 2023; Dell'Acqua et al., 2023].

The development of predictive competence using AI is industry-specific. For example, in medicine, LLMs show significant potential for improving predictive diagnostic accuracy [McCoy et al., 2024; Varghese, Chapiro, 2024], while in accounting and auditing the emphasis is on data analysis, interpretation of results and risk management [Anica-Popa, Vrîncianu, Anica-Popa, Cismasu, Tudor, 2024].

The relevance of the topic is reinforced by the need to rethink educational programs and approaches to professional development. As [Hersh, 2025] notes, generative AI has had a significant impact on biomedical and medical education, but there are challenges in using AI in education that need to be addressed. This includes the development of new pedagogical approaches focused on developing critical thinking and effective interaction with AI [Joseph, 2023].

Given the factors described, research into the impact of artificial intelligence on the development of predictive competence of modern professionals is not only relevant, but also an urgent task. It has the potential to form well-founded recommendations for integrating AI into professional activities and education, maximizing positive effects and minimizing potential risks, as well as developing strategies for adapting to new technological realities.

The purpose of the study is to comprehensively analyse and theoretically substantiate the impact of modern artificial intelligence technologies (in particular, large language models and generative AI) on the formation, development and transformation of predictive competence in modern specialists.

In accordance with the purpose, the following **research tasks** have been identified:

1. Conceptualizing predictive competence in the AI era and analyse the transformation of its key structural components (cognitive, regulatory, and communicative) under the influence of modern intelligent technologies.
2. Investigating the mechanisms of influence of AI tools on cognitive forecasting processes (data analysis, pattern detection, modelling, and probability estimation), identifying both the benefits and potential risks and challenges of their integration.
3. Justifying the need to adapt educational programs and professional development strategies to develop the specialists' competencies necessary for effective and responsible interaction with AI in predictive activities.

Methods of scientific research employed are as follows: theoretical analysis and synthesis – used to study scientific literature, identify key concepts (predictive competence, AI), analyse existing theories and approaches, identify trends and contradictions, and integrate heterogeneous data into a holistic picture of the impact of AI; generalization – used to formulate conclusions based on the analysis of numerous sources and empirical data from various studies, highlighting general patterns of the impact of AI; conceptual analysis – used to clarify the essence, structure, and content of the concept of "predictive competence" in the context of digital transformation and the impact of AI; comparative analysis – used to compare the predictive capabilities of AI and a human expert (based on data from other studies), as well as to analyse various models of human-AI interaction; analysis of scientific literature – systematic selection, study, and critical evaluation of relevant scientific publications, reports, and studies to form the theoretical basis of the work and substantiate the relevance, conclusions, and recommendations.

Presentation of basic material. Let us consider the problem of conceptualizing the concept of predictive competence in the context of the digital transformation of professional activity and determining its structural components that are most affected by artificial intelligence technologies.

Digital transformation, which covers all areas of modern professional activity, is characterized not only by the introduction of new technologies, but also by a fundamental change in the nature of work, requirements for specialists and the operating environment itself. The growth of data volumes, the acceleration of processes, the increase in the level of uncertainty and interconnectedness form a context in which the ability to effectively predict becomes not just a desirable, but a critically necessary quality of a professional. In these conditions, predictive competence is transformed from a static characteristic into a dynamic, integral property of the individual, which determines their ability not only to predict future states and results, but also to proactively adapt, make informed decisions and act effectively in conditions of permanent change and information saturation.

Rethinking the essence of predictive competence requires going beyond its traditional understanding as a simple ability to predict. In the context of digital transformation, it is a complex, systemic formation of a specialist's personality, which provides not only anticipation of the likely development of events, but also the ability to optimally design their own activities to achieve professional goals and minimize risks [Бунас, 2014]. This implies the ability to operate with large data sets, identify complex, often nonlinear dependencies, model multiple scenarios and choose the most adaptive behavioural strategies. The significance of this competence is enhanced by the fact that AI systems, especially generative models and large language models (LLM), demonstrate impressive, sometimes superhuman, accuracy in solving specific predictive tasks in various domains, from behavioural sciences to neuroscience [Lippert et al., 2024; Luo et al., 2024]. Therefore, predictive competence of a modern specialist is inextricably linked to the ability to effectively and critically interact with these technologies, integrating their capabilities into their own cognitive and activity process to make informed decisions [Anica-Popa, Vrîncianu, Anica-Popa, Cișmașu, Tudor, 2024]. This ability is still based on the anticipation mechanism, but its implementation in the digital environment is significantly modified under the influence of available tools and information flows [Бунас, 2014].

Analysing the structure of predictive competence, which traditionally includes cognitive, regulatory, communicative, and personal components, it is necessary to identify those of them that undergo the most profound transformation under the influence of AI.

Undoubtedly, the cognitive component is under the most intense influence. AI technologies, in particular machine and deep learning, provide unprecedented opportunities for processing big data (Big Data), identification of complex patterns and construction of highly accurate predictive models, which significantly expands the analytical capabilities of a specialist [Lippert et al., 2024; Luo et al., 2024]. AI is a powerful tool for generating hypotheses and modelling scenarios. However, along with the expansion of capabilities, new challenges arise. There is a critical need for the ability of a specialist to assess the quality, reliability and potential bias of the data used to train AI, as well as to critically interpret the results generated by algorithms [Joseph, 2023; Buçinca et al., 2023]. There is a risk of over-reliance on AI and potential atrophy of one's own analytical skills. There is a shift in emphasis from self-generation of predictions to validation, interpretation and contextualization of the ones made by AI. Therefore, the impact of AI on the cognitive component is dialectical: it expands the capabilities of analysis and modelling, but at the same time places increased demands on the critical thinking and metacognitive skills of the specialist.

The regulatory component responsible for goal setting, planning, decision-making and adaptation is also undergoing significant changes. AI can provide a more accurate and comprehensive information basis for strategic and operational decisions, help in assessing the risks of various scenarios and automate the monitoring of key indicators. This potentially improves the quality and validity of management decisions. However, the decision-making process is increasingly taking on the character of a hybrid "human-machine" interaction [Dell'Acqua et al., 2023), which raises new questions about the distribution of responsibility, the autonomy of the professional and the need to develop new ethical and procedural frameworks. The ability to adapt now includes not only responding to external changes, but also flexibility in using AI recommendations and constantly adapting to the evolution of intelligent systems themselves.

The communicative component is transformed by the emergence of a new subject of interaction – artificial intelligence. The effectiveness of predictive activities increasingly depends on the ability of a specialist to clearly formulate requests to AI systems (prompt engineering), understand the logic (or its features) of their functioning and interpret the results in a joint workflow [Korzynski, Mazurek, Krzypkowska, Kurasinski, 2023]. There is a need to develop communication skills *with* AI. This in turn implies the ability to explain to colleagues, clients or other stakeholders the decisions made with the participation of AI, including the justification for the choice of the model, its limitations, the level of confidence and potential risks of bias [Buçinca et al., 2023].

Although the personal (value-motivational) component is rather indirectly influenced, its role does not diminish. The integration of AI requires a high level of ethical awareness from the specialist to navigate the complex issues of fairness, transparency, confidentiality and potential discrimination that may be embedded in algorithms [Walkowiak, MacDonald, 2023]. The need for lifelong learning and openness to new ways of working become key factors for successful adaptation. The ability to maintain motivation and professional identity in the face of potential automation of some predictive functions is also an important aspect.

Thus, the conceptualization of predictive competence in the era of digital transformation requires its recognition as a dynamic, multi-level property, inextricably linked to the ability to effectively use technological tools. Although all structural components are interconnected, it is the cognitive, regulatory and communicative components that are most directly and deeply affected by artificial intelligence technologies, which necessitates a review of approaches to their formation and development in modern specialists. The future of predictive competence is seen in the synergy of human intelligence and AI capabilities, where the key role will be played by the ability of a person to think critically, manage the process and take responsibility for the final results.

Let us consider the mechanisms of influence of artificial intelligence tools on cognitive forecasting processes. The penetration of artificial intelligence (AI) technologies into various spheres of professional activity initiates a fundamental restructuring of cognitive processes that ensure the forecasting competence of specialists. The impact of AI goes beyond the simple automation of routine operations, touching the very mechanisms of human thinking responsible for analysing information, identifying patterns, constructing future scenarios and assessing their probability. A detailed consideration of these mechanisms, based on the analysis of current scientific research, allows us to outline the contours of the transformation of predicting activities and identify both opportunities for its qualitative improvement and potential cognitive traps and challenges.

The transformation of data analysis under the influence of AI is perhaps the most obvious and profound. Human cognitive capabilities, despite their flexibility, have inherent limitations on the volume and complexity of information that can be effectively processed simultaneously. AI, in particular machine learning and deep learning algorithms, overcome these limitations, providing the ability to analyse petabytes of structured and, most importantly, unstructured data (text, images, audio files) with unprecedented speed and depth [Luo et al., 2024; Hersh, 2025]. The mechanism of this influence lies in the ability of algorithms to apply complex mathematical and statistical methods for feature extraction, detection of multidimensional correlations, clustering and classification of data that may not be obvious to a human observer. For example, in financial forecasting, AI can analyse not only market quotes, but also news, social media and macroeconomic reports to detect weak signals preceding changes in market conditions. This leads to a fundamental change in the role of the specialist: from the direct performer of analytical procedures, they turn into the architect of the analytical process – the one who formulates the problem, identifies relevant data sources, selects and configures appropriate AI tools, and most importantly – carries out critical validation and contextual interpretation of the obtained results. However, this transformation is not without challenges. The "black box" problem inherent in many modern AI models makes it difficult to understand the logic behind the conclusions, which undermines trust and complicates verification, especially in high-risk areas. There is also the risk of excessive cognitive overload (cognitive offloading), when delegating analytical functions to AI can lead to a decrease in the specialist's own analytical skills, if this is not compensated by the development of higher-order skills – critical thinking and AI management. Moreover, AI, especially LLM, does not always demonstrate sufficient factual accuracy [Cobb, 2023], which requires constant verification.

Pattern and regularity detection, as a basis for making predictions, is another cognitive function that is undergoing significant modification. AI systems, especially those using neural networks, demonstrate an extraordinary ability to identify complex, nonlinear, temporal, and spatial patterns in data, often surpassing human capabilities in this area [Lippert et al., 2024; Nolfi, 2024]. They can reveal subtle correlations that remain unnoticed due to human cognitive biases (e.g., confirmation bias, availability heuristic) or due to limitations in working memory. The mechanism of this effect lies in the ability of algorithms to learn from large sets of examples and automatically highlight statistically significant features and relationships. This allows generating new hypotheses about predictive factors in the phenomena under study [Luo et al., 2024]. However, a key limitation remains that AI mainly detects correlations, not causal relationships. Establishing causal relationships, which is critical for reliable prediction and understanding of the system, still requires deep expert knowledge, theoretical justification, and often specially designed experiments or causal analysis methods that are not always implemented in standard AI tools. The role of the expert is to filter and interpret the detected AI patterns, integrate them with existing knowledge, check their robustness and practical relevance, and be aware of possible biases that can be "learned" by AI from training data and lead to erroneous or discriminatory predictions [Walkowiak, MacDonald, 2023].

Scenario modelling and prediction of future developments also gain new features thanks to the generative capabilities of AI, in particular LLM. These systems can quickly generate multiple, verbally described scenarios of the development of the situation based on given conditions, historical analogies and detected trends [Han, 2023]. This can be a useful tool for brainstorming, expanding the spectrum of possible futures and overcoming "tunnel vision". The generation mechanism is based on complex probabilistic models of language, which allows the creation of coherent and plausible narratives. However, this plausibility does not always guarantee the realism or validity of the scenarios. AI, learning from past data, may demonstrate limited ability to predict unprecedented events ("black swans") or to take into account fundamental changes in the system not reflected in the data. Generative models are also prone to "hallucinations" – the generation of factually incorrect, although plausible, information [Mahowald et al., 2024]. Therefore, the effectiveness of scenario modelling using AI depends largely on human control and expertise. The specialist must identify key assumptions, provide contextual information, formulate precise queries (prompts) that guide the generation [Korzynski, Mazurek, Krzypkowska, Kurasinski, 2023], and critically evaluate the generated scenarios for logical consistency, compliance with known facts and theoretical patterns, as well as their practical relevance. The process often takes on an iterative nature of interaction, where the human and AI jointly construct and refine a vision of the future [Dell'Acqua et al., 2023].

Estimating probabilities and uncertainties is the final step in many forecasting tasks. AI models built on statistical principles can provide quantitative estimates of the probabilities of certain events or scenarios, often with corresponding confidence intervals [Lippert et al., 2024; Luo et al., 2024]. This potentially allows us to move from qualitative judgments ("probable", "unlikely") to more accurate and objective assessments, which is important for decision-making under risk. AI mechanisms here include the use of various regression models, Bayesian networks, classification methods that allow us to calculate the probabilities of belonging to a certain class or achieving a certain value. However, it is important to understand that these probabilities are a product of the model, and not a direct measure of objective reality. Their accuracy depends on the quality of the data, the adequacy of the model's assumptions, and its ability to calibrate (the correspondence of the predicted probabilities to real frequencies). A specialist plays a key role in interpreting these probabilistic estimates. This includes understanding the sources of uncertainty (aleatory, related to the randomness of the phenomenon, and epistemic, related to the limitations of knowledge and the model), critically assessing the reliability of the figures provided by the AI, and integrating them with their own expert judgment, intuition, and qualitative information that may not have been taken into account by the model. Effective communication of predictive uncertainty and probabilities obtained with the help of AI becomes a separate important task [Collecchia, 2020].

The impact of AI tools on cognitive forecasting processes is multifaceted and dialectical. AI acts as a powerful cognitive amplifier that expands the analytical, pattern-recognition and modelling capabilities of a person. However, it does not eliminate the need for human thinking, but on the contrary, it places increased demands on higher-order skills: critical analysis, systemic vision, contextual interpretation, ethical reflection and the ability to strategically manage complex human-machine systems. The successful future of forecasting activities is seen not in complete automation, but in the development of synergistic interaction, where the advantages of artificial intelligence are combined with unique human qualities – deep understanding, intuition, value orientations and responsibility.

The conducted research allows us to draw a number of solid conclusions regarding the impact of the rapid development of artificial intelligence (AI) technologies, in particular large language models and generative AI, on the formation, development and transformation of predictive competence in modern specialists. The relevance of this problem is confirmed not only by technological changes, but also by their profound impact on the nature of professional activity, competency requirements and educational paradigms.

It has been established that modern AI systems demonstrate significant potential for improving the efficiency and accuracy of predicting activities. Empirical evidence from various fields, from behavioural sciences and neuroscience to consulting and customer support, indicates the ability of AI not only to reach, but sometimes surpass human experts in specific forecasting tasks. This positive impact is due to the unique capabilities of AI in processing large data sets, identifying complex, non-obvious patterns and regularities, modelling multiple scenarios and quantifying probabilities, which significantly expands human cognitive capabilities.

It is determined that the impact of AI on predictive competence is not a simple enhancement of existing skills, but it rather leads to its fundamental transformation. The essence of predictive competence in the AI era is shifting from the ability to independently generate an accurate prediction to the ability to effectively manage complex human-machine systems, critically evaluate the results of AI work and integrate them into the decision-making process. This requires a rethinking of the structure of the competence itself. The cognitive component is enriched with analysis tools, but at the same time requires the development of metacognitive skills, critical thinking and the ability to validate AI conclusions. The regulatory component is transformed due to the emergence of hybrid decision-making models and new challenges regarding responsibility and adaptability. The communicative component is expanded due to the need to interact with AI (prompt engineering) and communicate the results obtained with its participation.

It is important to recognize the dialectical nature of the impact of AI, which carries not only significant benefits but also significant risks and challenges. These include the dangers of over-reliance on technology and the potential atrophy of one's own predictive skills; the "black box" problem that makes trust and verification difficult; risks associated with algorithmic bias that can lead to unfair or discriminatory predictions; privacy and data security issues; and the potential lack of factual accuracy or the tendency for some AI models to generate false information ("hallucinations") [Walkowiak, MacDonald, 2023; Buçinca et al., 2023; Cobb, 2023; Mahowald et al., 2023]. In addition, uneven access to AI and differences in the benefits of its use by different categories of professionals (e.g., less and more experienced) may deepen existing disparities in the labour market [Brynjolfsson, Li, Raymond, 2023; Dell'Acqua et al., 2023].

The role of the modern specialist in predictive activities is undergoing radical changes. AI does not so much replace a person as it transforms their functions, freeing up time from routine tasks to focus on activities that require critical thinking, creativity, ethical judgment, empathy and deep contextual understanding. The specialist increasingly acts as a moderator, validator, interpreter and ethical controller of the predictive process, managed with the participation of AI. Success in the future will depend on the ability to build synergistic interaction, where unique human qualities are complemented by computing power and analytical capabilities of AI. Different models of such interaction may be optimal for different tasks and professional contexts [Dell'Acqua et al., 2023].

The realization of the depth and scope of AI's impact on predictive competence dictates an urgent need to review and adapt educational programs and professional development strategies. It is necessary to form in future and current professionals not only knowledge about the possibilities of AI, but also a deep understanding of its limitations, to develop skills for critical evaluation of AI tools and their results, to form an ethical awareness of the use of data and algorithms, and to teach methods for effective and safe interaction with intelligent systems [Hersh, 2025; Joseph, 2023; Anica-Popa, Vrîncianu, Anica-Popa, Cișmașu, Tudor, 2024]. This implies the integration of AI literacy and digital ethics into curricula at all levels of education.

Conclusion. The revealed fundamental transformation of the essence and structure of predictive competence under the influence of AI justifies the urgent need to move from general declarations about the need to adapt educational systems to the development and implementation of specific pedagogical strategies and tools. Simple AI literacy is no longer enough; its goal is the formation of a specialist capable of effective, critical and ethical interaction with intelligent systems in the process of solving complex predictive tasks. To achieve this goal, educational programs should be enriched with the following elements:

– Practice-oriented integration of AI tools into professional disciplines. Instead of studying AI in a vacuum, it is necessary to ensure the active use of relevant tools (from LLM for generating hypotheses and scenarios to specialized analytical platforms) directly when solving educational tasks within the subject area. For example, marketing students can use AI to analyse large arrays of consumer feedback and identify trends, but with subsequent mandatory verification and interpretation of the results based on theoretical knowledge.

– Targeted development of skills for critical evaluation of AI products. Learning tasks should systematically train students' ability to assess the quality, reliability, potential bias of data used to train AI, and critically analyse generated predictions or recommendations. This includes tasks to compare the results of different AI models, identify logical inconsistencies or "hallucinations" in LLM responses, and analyse uncertainty and the limits of applicability of a particular algorithmic prediction.

– Prompt engineering competence for predictive purposes. Specialized training and workshops should be conducted to develop skills in formulating effective, contextually rich, and iterative queries to generative AI models to obtain the most relevant and accurate predictive data or scenarios, as well as understanding the impact of query formulation on the final result.

– Promoting the development of metacognitive skills. It is important to encourage students to reflect on their own thinking and work strategies when using AI, to be aware of the risks of excessive cognitive overload, and to develop the ability to consciously control the process of human-machine interaction.

The implementation of these specific measures will allow us to prepare specialists who not only know about AI, but also know how to use it as a powerful tool to strengthen their own predictive competence, while maintaining criticality, responsibility, and the ability for deep human judgment.

In summary, artificial intelligence is irreversibly changing the landscape of professional activity, especially in the field of forecasting. Its impact on predictive competence is profound, multifaceted and controversial. Maximizing positive effects and minimizing risks requires a proactive, critical and adaptive stance from professionals, educational institutions and organizations.

Further research should be aimed at in-depth study of the long-term cognitive and social consequences of AI integration, development of reliable methods for assessing hybrid predictive performance, creation of effective learning and adaptation strategies, as well as formation of mechanisms for ensuring the responsible and ethical use of AI to build a future where technology serves to enhance human potential.

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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE DEVELOPMENT OF PREDICTIVE COMPETENCE IN MODERN SPECIALISTS

Viacheslav Osadchyi, Doctor of Sciences in Pedagogy, Full Professor, Correspondent Member of the Academy of Educational Sciences of Ukraine, Borys Grinchenko Kyiv Metropolitan University, Kyiv, Ukraine; Leading Researcher, Institute for Digitalisation of Education of the National Academy of Educational Sciences of Ukraine, Kyiv, Ukraine.

E-mail: v.osadchyi@kubg.edu.ua

https://orcid.org/0000-0001-5659-4774

Maksym Pavlenko, PhD in Pedagogy, Associate Professor, Department of Computer Technologies and Informatics, Berdyansk State Pedagogical University, Zaporizhzhia, Ukraine.

E-mail: mp_pavlenko@bdpu.org.ua

https://orcid.org/0000-0003-0091-696X

Liliia Pavlenko, PhD in Pedagogy, Associate Professor, Department of Computer Technologies and Informatics, Berdyansk State Pedagogical University, Zaporizhzhia, Ukraine.

E-mail: lv_pavlenko@bdpu.org.ua

https://orcid.org/0000-0001-7823-7399

Oleksii Sysoiev, Dr. hab., Doctor of Social Sciences in the discipline of economics and finance, Department of social sciences − The Mazovian University in Płock, Plock, Poland.

E-mail: o.sysoiev@mazowiecka.edu.pl

https://orcid.org/0000-0001-5899-0244

Vladyslav Kruglyk, Doctor of Sciences in Pedagogy, Full Professor, Department of Informatics and Cybernetics, Bohdan Khmelnytsky Melitopol State Pedagogical University, Zaporizhzhia, Ukraine.

E-mail: krugvs@mdpu.org.ua

https://orcid.org/0000-0002-5196-7241

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Keywords*: predictive competence, artificial intelligence (AI), large language models (LLM), generative AI, professional development, higher education, cognitive processes, human-AI interaction / human-machine interaction, skill transformation, critical thinking.*

The relevance of this study stems from the rapid development of artificial intelligence (AI), particularly large language models and generative technologies, which are profoundly transforming professional activity. These changes significantly influence the formation of predictive competence – a crucial human capacity for reasoned forecasting and decision-making under uncertainty. Empirical data confirm the high accuracy of AI-generated forecasts, sometimes surpassing that of humans, and indicate improved professional productivity when AI is used effectively. At the same time, diverse adaptation patterns to AI use necessitate a rethinking of the role of human judgement and raise concerns about technological dependency, algorithmic bias, and unequal access to innovation. These challenges call for a reorientation of educational approaches, placing emphasis on critical thinking and skills for effective human-AI interaction.

The ***purpose*** *of the study is to conduct a comprehensive analysis and theoretical substantiation of the impact of modern AI technologies – particularly large language models and generative AI – on the development and transformation of professionals' predictive competence.*

Research objectives are as follows: to conceptualise predictive competence within the context of digital transformation; to analyse structural shifts in its key components (cognitive, regulatory, and communicative); to explore the mechanisms of AI's influence on cognitive predicting processes; to systematise potential advantages and risks associated with the integration of AI in professional contexts.

The study employs theoretical ***methods*** *such as analysis, synthesis, and generalisation of findings from interdisciplinary research, as well as conceptual and comparative analysis of human-AI interaction models and the evolving essence of predictive competence.*

AI demonstrably increases the efficiency of forecasting processes but simultaneously transforms their nature – from autonomous human-generated predictions to the management of hybrid human-machine systems. This shift requires professionals to acquire new skills, including critical evaluation and validation of AI outputs, prompt engineering, and the integration of AI-generated insights into complex decision-making. The most significant transformations influence the cognitive, regulatory, and communicative components of predictive competence. The dual nature of AI's impact is evident – offering enhanced analytical capabilities

while posing risks of hallucinations, cognitive inertia, and increased digital inequality. Accordingly, the professional role evolves from that of executor to analyst, moderator, and ethical regulator of forecasting processes.

Conclusions. *Artificial intelligence is irreversibly reshaping the landscape of professional activity, particularly in the domain of forecasting. Its influence on predictive competence is deep, multifaceted, and at times contradictory. Maximising its benefits while mitigating associated risks requires a proactive, critical, and adaptive attitude from professionals and educators alike. To this end, educational programmes should be enriched with: practice-oriented integration of AI tools into professional curricula; targeted development of skills for evaluating AI outputs; competence in prompt engineering for forecasting; the promotion of metacognitive awareness. These measures will enable the preparation of specialists who do not merely understand AI but can employ it purposefully, critically, and responsibly to enhance their predictive capacities.*

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