Educator Insights: A Journal of Teaching Theory and Practice
Volume 01, Issue 12, December 2025
brightmindpublishing.com
ISSN (E): 3061-6964
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METHODOLOGY FOR ASSESSING THE CONSEQUENCES OF THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE AND ITS IMPACT ON THE HUMAN FACTOR

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Abstract
This article examines artificial intelligence, which has emerged as one of the main technological drivers of the 21st century, its role on a global scale, in particular its deep penetration into almost all layers of economic, political, social, and cultural life, and a socio-philosophical analysis of how the large-scale introduction of AI will radically change the forms of human activity, professional labor relations, intellectual potential, and even psychological stability. A methodology for systematically studying the consequences of the development of AI, especially its impact on the human factor, is developed.

Keywords: Artificial intelligence, human factor, technological progress, psychological, sociological, and cognitive diagnostic methods, psychometric indicator.

Introduction

The rapid penetration of artificial intelligence into the cyber world is leading to revolutionary changes in many areas. In particular, the global employment system is being reformatted as a result of the penetration of artificial intelligence into the labor market. According to forecasts by various international organizations - the World Economic Forum, the International Labor Organization, and the OECD - millions of traditional professions will be automated in the coming decades, while new techno-intellectual professions will emerge.

This process requires retraining human capital, transforming professional competencies, and forming a new model of human interaction with technology.

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In addition, the active involvement of AI systems in decision-making processes is redefining human moral and social responsibility. For example, as intelligent algorithms make independent or semi-autonomous decisions in areas important for social life, such as medicine, transportation, security, and education, there is a need to develop a methodology for assessing the safety parameters, reliability, and stability of human-algorithm cooperation.

In general, SI technologies are also having a profound impact on the spiritual and psychological environment of society. The acceleration of information flow, the dominance of digital communication, increased cognitive load, fragmentation of attention, and increased technostress are affecting the human psyche and cultural values. Therefore, the development of psychometric indicators that determine the level of interaction with SI and criteria for assessing a person's digital resilience, as well as spiritual and moral standards for the use of SI tools, is one of the priority tasks of the world scientific community. However, despite this, the lack of a single universal methodology for assessing the impact of SI in the world scientific space further increases the relevance of this direction.

The approaches, indicators, criteria, and methods used in different countries are different, which requires the development of new integrative, synthesized, coherent methodologies for scientific research. Especially relevant are multidisciplinary areas that require a comprehensive assessment of indicators related to the human factor -cognitive activity, motivation, digital competence, psychological well-being, cultural adaptability, etc.

Literature review and methods

In recent years, a number of studies have been conducted to assess the impact of artificial intelligence on the human factor. In particular, the discussion of Gathering Strength, Gathering Storms, the broad impact of AI on society, risks, and prospects is considered in a multidisciplinary approach and longitudinal analysis, and several important aspects of the problem are described [1, 33-67-b]. In the article by G. Shankulova, “Ethical Aspects and Risks of Artificial Intelligence,” the ethical aspects of artificial intelligence, risks, transparency, discrimination in algorithms, and responsibility are analyzed empirically and experimentally [2, 232-238-b]. T. Rakhimov studies artificial intelligence and the problems it creates in the context of society, personality, and moral axiology using a philosophical analytical method [3, 30-43-b]. BIZokirov and MO'ralova

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examined the relationship between AI and humans and the new ethical aspects of security in a local context [4, 258-264-b]. Nevertheless, there are many issues that need to be addressed in research on the consequences of the development of artificial intelligence and the methodology for assessing its impact on the human factor. In particular, scientific and practical studies on the social, economic, and cultural consequences of the impact of AI on the labor market, occupational structure, education, inequality, discrimination, and the stability of society are waiting for their authors.

Analysis and results

Whether we want it or not, it will happen; that is, artificial intelligence will become the most visible and constant phenomenon at the center of demand and desire in modern society. Because artificial intelligence is a virtual mind that has mastered the thinking ability inherent in the human mind, it is able to act in accordance with the thinking of a person (with the help of computers and algorithms) in the process of studying the essence of the problem, analyzing it, and making decisions. Its capabilities are increasing, which means that over time it will become a "powerful force." As the demand for AI increases in this direction, in the near future we will no longer need to "think" or "think to make decisions on certain problems." In everything, "artificial intelligence" will take precedence, occupying "our hearts and minds" with its attractiveness.

So, is this good or bad!? How right is it to rely on artificial intelligence and to assign it functions that are inherent in humans!? This issue has not yet been seriously considered. Because at the moment, what is important for us is an attempt to use artificial intelligence to the maximum [5, 38-47-b]. So, it is possible to make forecasts about the consequences, but there is still time to draw conclusions about reality. However, despite this, a number of scientific conclusions are being made about the positive and negative forms of artificial intelligence in the system of real social relations of society. For example, what benefits does the development of AI bring to society in terms of economy, security, and psychology? If we think about this question, the application of artificial intelligence to the production sector will automate, optimize, reduce errors, and accelerate analytical decision-making. This will certainly lead to the emergence of new fields and jobs, such as data science, machine learning engineering, SI ethics, and algorithm auditing.

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In addition, it will lead to the expansion of human capabilities, in particular, automated assistants, personalization in education, and increased accuracy in medical diagnostics. In addition, it will provide significant advances in improving security and governance. Examples include transportation safety (autonomous systems), early detection of anomalies in cybersecurity, etc. At the same time, we can also talk about the universal consequences observed in terms of the negative impact of artificial intelligence. These include:

The threat of replacing human labor (employment). For example, some professions may disappear as routine and repetitive tasks are performed by AI.

Algorithmic discrimination and injustice. It is possible to cite the emergence of incorrect decisions (lending, hiring, monitoring) due to bias in the trained data. Algorithmic discrimination is the phenomenon in which algorithms, especially artificial intelligence and machine learning systems, make unfair, unequal, or discriminatory decisions against certain groups due to incorrect or deviant (biased) trends in the data.

Psychological effects of the development of artificial intelligence. In this direction, AI is considered to have a systemic impact [6, 174-b]. They can be observed in everything from personal psychology to social psychology, labor psychology, cultural behavior, etc. The seriousness of the issue is that the individual impact of AI on the psychology of the individual leads to dangerous situations in a number of areas. For example, effects on human cognition. There is a possibility that the ability of people to independently analyze will weaken as a result of a decrease in mental load, instead of an increase in routine tasks, that is, as a result of AI performing them.

In the psychology of the individual, cognitive functions such as memorization and calculation may lose their function, and as an alternative, the creative and strategic thinking capabilities of the SI may increase. Also, as a result of a person's reduced attention span, a person may experience mental lapses. Therefore, the use of digital systems leads to a division of attention. Emotional effects on daily activities. What do these include?

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Technostress. A type of stress that occurs as a result of constant work with technology. For example, information overload, multitasking, and difficulty adapting.

Trust and distrust in artificial intelligence. Some users are overly trusting of AI decisions, while others are anxious and skeptical. This ambivalence becomes a permanent habit in a person over time. Feelings of loneliness. Spending a lot of time with digital assistants leads to a decrease in cultural and interpersonal connections. Impact on the psychology of trust.

For example, anthropomorphization of AI - a person thinks by giving AI human characteristics, which leads to false expectations. Or increased reliance on automated decisions, in which people are forced to "delegate" their choices to AI recommendations. The following assessment methodologies are used in studies aimed at finding the social aspect of the above situations:

1. Goal setting. This sets the main goal of the assessment [7, 99-101-b]. These include determining the impact on labor productivity, determining changes in the psychological state and motivation of employees, determining the need for skills and competencies, identifying algorithmic risks and ethical issues, and determining the principles of fairness in the decision-making process.

2. Developing assessment indicators. At this stage, multidimensional indicators are prepared to assess the impact on the human factor. In this case, the following are selected as indicators of impact on labor activity:

– work efficiency;
– level of automation;
– need for retraining;
– time-saving indicators.

Psychological indicators:

– stress level;
– trust and satisfaction;
– motivation;
– trust in algorithmic decisions.

Social and ethical indicators:

– equality and risk of discrimination;
– level of openness and explanation;

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– information confidentiality.
Competency indicators:
– digital literacy;
– skills in working with AI;
– flexibility in learning.

3. Data collection stage, which is also carried out based on several methodologies (8, 106-b). The principle of operation of this method focuses on the following criteria:
a) Surveys (measuring psychological and social impact among employees, consumers, or students);
b) Observation (observing departments where AI is used in processes);
c) Interviews (in-depth interviews with management, experts, and users);
d) Legal and technical analysis (algorithms, decision-making mechanisms, audit logs);
e) Experimental evaluation (comparing results before and after the introduction of AI).

4. There are analysis methods, the principle of which is also diverse, including: Qualitative analysis (content analysis, expert assessment, and risk rating). Quantitative analysis (statistics and correlation; KPI comparison (before and after AI implementation); psychometric measurements). Algorithmic security analysis (model bias tests, fairness metrics, risk matrix (probability × impact strength), etc.

5. Integrated assessment model. In this case, each indicator is assessed in a scoring system. Scores: 1-very low, 5-very high impact. Then the results are integrated into the following criteria:
1) Human Capital Impact Index (HCI).
2) Psychological Impact Index (PII).
3) Ethical Risk Index (EXI).
4) Automation Impact Index (ATI).
Finally, based on the overall results, the AI Human Factor Impact Coefficient (AIHFI) is determined.

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6. Methodology for developing conclusions and recommendations. In this case, decisions are made on the following indicators based on the overall impact level:
– retraining and education strategies;
– redesign of work processes;
– ethical control mechanisms;
– algorithmic audit;
– includes recommendations for psychological support [9, 447-479-b].
In short, regular reassessment of the results of the analysis during monitoring of research results allows us to understand the essence of the problem. These can be implemented in the following order:
– repeated assessment every 6 or 12 months;
– monitoring of changes in indicators;
– implementing and evaluating an early warning system.

Conclusion

The impact of artificial intelligence requires differentiation into primary (direct), secondary (indirect), and long-term consequences. A systematic analysis allows us to interpret human-technology relations as a complex sociotechnical system. Based on this, we find it appropriate to make the following observations:
1. To measure the positive and negative consequences of AI, indicators such as labor productivity, impact on employment, algorithmic safety, psychological resilience, moral stability, level of privacy protection, and digital well-being are included. These indicators clearly reflect the multidimensional nature of the impact on the human factor.
2. Assessing the potential dangers and risks of artificial intelligence is one of the main functions of the methodology, allowing us to identify factors such as algorithmic discrimination, strengthening of potential control mechanisms, reduction of independence due to automation of human decisions, and threats to privacy.
3. The methodology serves as a scientific basis for the formation of a human capital development strategy. It helps to identify new competencies, adapt the personnel training system, improve information culture, and assess the level of digital adaptation of society.

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4.The positive opportunities of artificial intelligence for society - the development of an innovative economy, increased management efficiency, modernization of education and healthcare - can be clearly identified with the help of the methodology and directed towards social benefits.

5. A scientific and methodological approach to assessing the impact on the human factor is necessary to ensure sustainable socio-cultural development against the backdrop of the rapid development of artificial intelligence, minimize the consequences of technological transformations, and guarantee the technological security of society.

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