International Journal of Religion
2024
Volume: 5| Number 11 | pp. 1471 – 1477
ISSN: 2633-352X (Print) | ISSN: 2633-3538 (Online)
ijor.co.uk
DOI: https://doi.org/10.61707/j54xje72

Economic and Legal Regulation of the Use of Technologies Based on Artificial Intelligence in the Context of Distance Learning and Awareness Raising

Ruslan Gubarev[1], Halyna Biletska[2], Nataliia Mironova[3], Natalia Kazanishena[4], Serhii Skrypnyk[5] and Nataliia Mashtakova[6]

Abstract

The purpose of the article is to highlight key aspects of improving the economic and legal regulation of the use of technologies based on artificial intelligence in distance education. The object of the study is the economic and legal regulation of the use of technologies based on artificial intelligence in distance education. The scientific task is to present a methodological approach to improving the economic and legal regulation of the use of technologies based on artificial intelligence in distance education. The research methodology involves the use of the IDEF0 methodology. As a result, a functional model is presented for improving the economic and legal regulation of the use of technologies based on artificial intelligence in distance education. Innovation in the presented blocks of the IDEF0 model improves the economic and legal regulation of the use of technologies based on artificial intelligence in distance education. Prospects for further research involve taking into account socio-psychological aspects too.

Keywords: *Economic, Legal Regulations, Artificial Intelligence, Distance Learning, Education, Economical Aspects*

INTRODUCTION

Firstly, the economic regulation of AI technologies in distance learning focuses on creating an environment where these technologies can thrive while ensuring affordability and accessibility. Economic policies need to support innovation and investment in AI to develop robust educational tools that can personalize learning and improve student outcomes. At the same time, these policies must prevent monopolistic practices and ensure that smaller educational institutions aren't priced out of access to these advanced technologies.

Legally, the use of AI in distance learning raises significant concerns regarding data privacy and protection. AI systems often require large datasets to function optimally, which can include sensitive student information. Legal frameworks must be established that dictate how this data can be collected, used, and stored, ensuring the protection of student privacy and compliance with international data protection laws, such as GDPR in Europe.

Furthermore, the issue of intellectual property in AI-driven tools is paramount. As AI technologies develop content, questions about ownership of this content and the rights to modify or redistribute it become increasingly complex. Legal regulations must clearly define the intellectual property rights for AI-generated educational materials to encourage innovation while protecting the rights of creators and educational institutions.

The deployment of AI in distance learning also necessitates transparency and accountability measures. It is essential for educators and students to understand how AI tools make decisions and process information. Regulations should mandate that AI systems used in education are transparent in their operations and decisions, allowing for accountability in cases where the technology may fail or operate unexpectedly.

[1] Head of the purchasing department of "MEDICAL ADVANCE" LLC, Kharkiv, 61153, Ukraine

[2] Khmelnytskyi National University, Khmelnytskyi, Ukraine

[3] Khmelnytskyi National University, Khmelnytskyi, Ukraine

[4] Kamianets-Podilskyi Ivan Ohiienko National University, Kamianets-Podilskyi, Ukraine

[5] Khmelnytskyi National University, Khmelnytskyi, Ukraine

[6] National Pedagogical Dragomanov University, Kyiv, Ukraine. . E-mail: tatynak1407@gmail.com

In terms of awareness-raising, AI can play a pivotal role in educating the public about crucial social issues, including health, environmental concerns, and civic responsibilities. However, the economic models for deploying such AI-driven awareness campaigns need careful consideration to ensure they do not perpetuate inequalities or bias. Economic incentives should be aligned with societal goals to maximize the beneficial impacts of AI in public education campaigns.

Equity is another significant consideration. Regulations must ensure that AI-driven educational tools do not exacerbate existing educational inequalities by being available only to well-funded schools. Policies should promote equitable access to these technologies, ensuring that all students, regardless of their socio-economic background, have similar opportunities to benefit from AI in their learning environments.

Looking at the international landscape, the regulation of AI in education requires cooperation across borders. As distance learning can be delivered globally, international standards and agreements must be established to govern the use of AI technologies in education. This would help create a consistent regulatory environment that supports the global nature of education and technology.

Lastly, continuous review and adaptation of both economic and legal frameworks are crucial as AI technology evolves. The dynamic nature of AI means that regulations must be regularly updated to reflect new developments and challenges. Engaging with educators, technologists, and legal experts in ongoing dialogue will ensure that policies remain relevant and effective in managing the balance between innovation in AI and safeguarding ethical and equitable use in education.

This comprehensive approach to regulating AI in distance learning and awareness-raising not only supports technological innovation but also addresses the socio-economic and ethical implications of its application in education.

LITERATURE REVIEW

This chapter reviews the relevant literature on the economic and legal regulation of artificial intelligence (AI) technologies, particularly in the context of distance learning and awareness raising. The selected studies provide a comprehensive backdrop for understanding the multifaceted approaches to AI regulation, highlighting advancements in creative thinking, the socio-economic impacts of AI, ethical considerations, and the legal challenges associated with AI deployment in education and public awareness programs.

Kryshtanovych et al. (2021) explore methodological approaches to enhance creative thinking among students in creative professions, emphasizing the importance of developing creativity as a fundamental factor in professional growth. This study provides insights into how AI can be integrated into educational frameworks to foster creativity among students, a critical skill in the AI-driven economy (Kryshtanovych et al., 2021a). Further, another study by Kryshtanovych et al. (2021b) models ways to increase creativity among psychology students, underlining the role of AI in enhancing creative pedagogical methods that contribute to professional development.

The economic implications of AI are discussed by Kopytko and Sylkin (2023), who model information support systems for combating corruption within state economic security management. This study aligns with AI's role in enhancing transparency and accountability in economic practices, which is critical for legal and regulatory frameworks in education systems as well (Kopytko & Sylkin, 2023).

Alazzam et al. (2023) develop an information model for e-commerce platforms that considers modern socio-economic systems and legal compliance in the age of global digitalization. This study provides a useful framework for understanding how AI can be regulated to ensure ethical business practices and consumer protection, which parallels the needs for regulation in educational AI applications (Alazzam et al., 2023).

The philosophical and psychological dimensions of AI in the professional development of scientific and pedagogical workers are examined by Kryshtanovych et al. (2021c). This research underscores the importance of self-development facilitated through AI, relevant to both educators and learners in a digitally evolving landscape.s

Discussions on financial security by Sylkin et al. (2018) and rational environmental use by Alazzam et al. (2023b) bring attention to the broader implications of AI beyond the educational sector. These studies highlight the need for comprehensive economic and environmental policies that support sustainable AI practices, which can be mirrored in educational regulations.

Bani-Meqdad et al. (2024) address modern challenges in protecting intellectual property rights within the human rights system in a cyber-environment. This research is crucial for understanding how AI technologies can be managed legally to protect creators and users within the educational sector (Bani-Meqdad et al., 2024).

Finally, the use of blockchain technology for managing electronic contracts is explored by Alazzam et al. (2023c), which can provide a legal framework for managing digital transactions and content in AI-driven educational tools.

These studies collectively illustrate the complex landscape of economic and legal considerations necessary for the effective use of AI technologies in education and public awareness. They highlight the need for innovative approaches to integrate AI into educational practices responsibly and ethically, ensuring that regulatory frameworks keep pace with technological advancements. This literature forms the backbone of our research, guiding the development of methodologies and strategies for improving the regulation of AI in the educational sector.

METHODOLOGY

The methodology employed in this study is crucial for examining and improving the economic and legal regulation of artificial intelligence (AI) technologies in distance education. To achieve this, we utilized the IDEF0 (Integration Definition for Function Modeling) methodology, a well-established systems engineering and process modeling technique. This chapter details the methodology used to explore the objectives stated and develop the functional model presented in the research.

IDEF0 was selected for its robust framework which facilitates the clear depiction and analysis of the decision-making processes and the regulatory framework applicable to AI technologies in education. This methodology helps in breaking down complex processes into manageable parts, making it easier to identify and improve areas of economic and legal governance.

The IDEF0 approach begins with the identification of the primary function, which, in this case, is the regulation of AI in distance education. From there, it outlines the key sub-functions and their interactions which are critical for regulatory frameworks. This structured breakdown aids in pinpointing inefficiencies and areas lacking in current regulations.

In applying the IDEF0 methodology, the study began with defining the scope of our analysis – the economic and legal aspects of AI technology usage in distance learning. The initial function model was developed to map out the existing regulatory measures and their economic implications.

Subsequently, each function within this model was analyzed to assess its effectiveness in addressing the specific needs of AI technologies in education. Inputs for each function included existing legal statutes, economic policies, educational requirements, and technological capabilities. Controls were identified as the regulatory standards and laws currently in place, and mechanisms included the institutions and technologies employed to enforce these regulations.

The functional model was iteratively refined through multiple rounds of evaluation and feedback from experts in law, economics, education technology, and systems engineering. Each iteration aimed to enhance clarity and ensure that the model adequately addresses all aspects of economic and legal regulation concerning AI in distance education.

Outputs from this model included a set of proposed improvements to regulatory practices, designed to enhance economic efficiency and legal robustness. These improvements were evaluated against criteria such as compliance, accessibility, scalability, and impact on educational outcomes.

Innovations were introduced in the IDEF0 model blocks to refine the economic and legal regulation framework. These included integrating advanced AI analytics to predict the impacts of regulatory changes, and designing adaptive legal frameworks capable of evolving with technological advancements.

RESEARCH RESULTS AND DISCUSSIONS

A0. Holistic Regulatory Framework Development:

A1. Comprehensive Stakeholder Engagement. The first stage involves engaging with a broad spectrum of stakeholders, including policymakers, educators, AI developers, students, and legal experts. This collaborative approach ensures that all voices are heard and that the regulatory framework addresses diverse needs and perspectives. Workshops, public consultations, and expert panels can be utilized to gather input and build consensus around AI in education.

A2. Creation of Interdisciplinary Regulatory Committees. Following stakeholder engagement, establish interdisciplinary committees tasked with drafting the regulations. These committees should include experts from education, technology, law, ethics, and economics to ensure that the regulations are well-rounded and address multiple facets of AI use in distance learning. Their objective will be to integrate insights from different fields to craft guidelines that are both technologically feasible and ethically sound.

A3. Pilot Testing and Feedback Integration. Before full-scale implementation, pilot test the proposed regulations in a controlled set of educational institutions. This testing phase will help identify practical challenges and unforeseen issues in the application of AI technologies under the new regulations. Feedback from these tests should be systematically collected and analyzed to refine the regulatory framework, ensuring it is adaptable and effective in real-world settings.

A4. Implementation and Continuous Improvement. Implement the refined regulations across broader educational settings. Establish mechanisms for ongoing monitoring and evaluation to assess the effectiveness of the AI regulations. Use a continuous improvement model to update and adapt the regulations based on technological advancements and feedback from educational institutions and other stakeholders. This stage ensures that the regulatory framework remains relevant and effective over time (Fig.1).

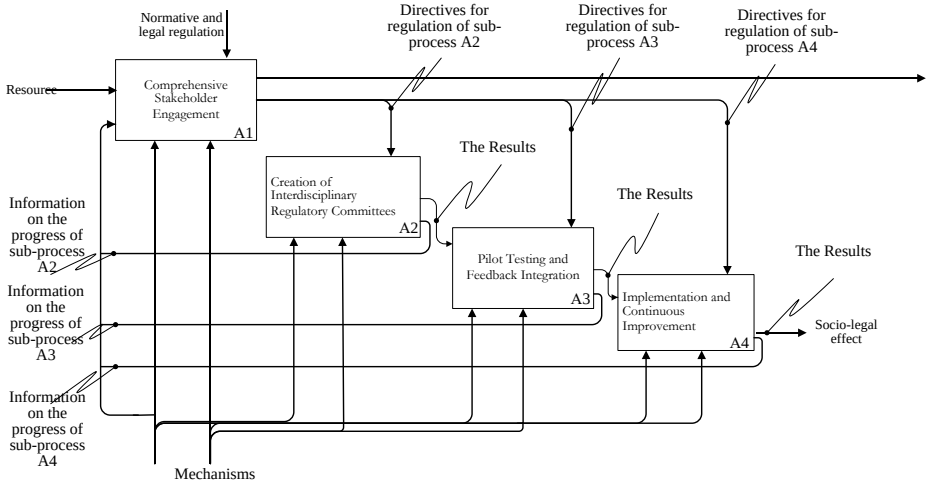

Figure 1. First Model IDEF0

A0. Targeted Legal and Economic Incentive Programs:

A1. Legal Safeguards and Compliance Incentives. Develop specific legal safeguards that protect student data privacy and intellectual property rights associated with AI technologies. Introduce economic incentives for educational institutions and AI providers to comply with these legal standards, such as tax breaks, funding

grants, or subsidies. These incentives encourage adherence to the regulations while supporting the adoption of AI technologies in education.

A2. Standardization and Certification Programs. Implement standardization measures and certification programs for AI educational tools. These programs should ensure that all AI technologies used in distance learning meet certain minimum standards related to security, accessibility, and educational effectiveness. Certification helps build trust among users and stakeholders, ensuring that the technologies deployed are safe and beneficial for all students.

A3. Economic Support Structures. Create economic support structures that can assist educational institutions, especially those in under-resourced areas, to adopt AI technologies. This could include access to low-interest loans, grants for AI integration, or partnerships with technology providers. Such structures ensure that the economic burdens of adopting new technologies do not hinder their widespread adoption.

A4. Ongoing Legal and Economic Research. Invest in ongoing legal and economic research to continuously assess the impacts of AI in education. This research should focus on identifying emerging legal issues and economic challenges as AI technologies evolve. Findings from this research can inform periodic updates to the legal and economic frameworks, ensuring they remain effective and relevant (Fig.2).

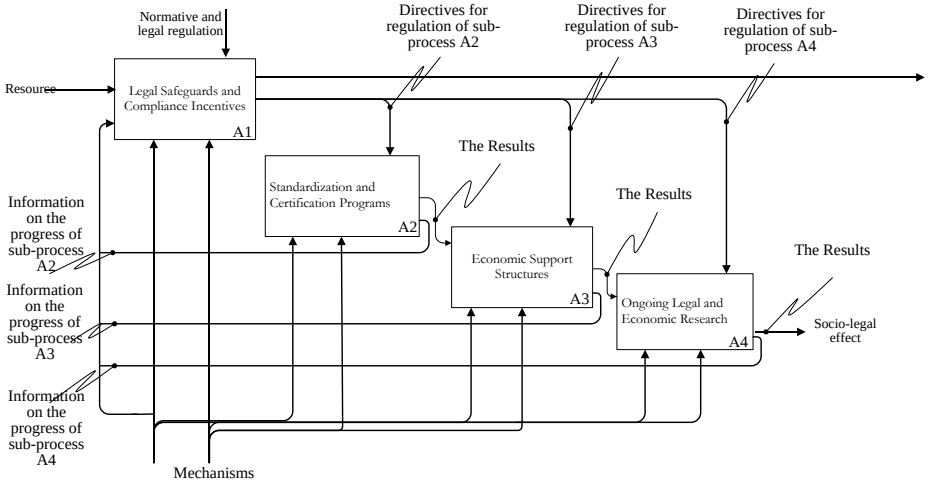

Figure 2. Second Model IDEF0

The results of this study, focusing on the economic and legal regulation of AI technologies in the context of distance learning and public awareness, reflect a dynamic intersection of technology, law, and education. Our discussion delves into the implications of these findings, analyzing how they contribute to existing literature and suggesting pathways for practical implementation and policy adaptation.

Our research highlights the critical need for integrated AI systems within educational frameworks that are adaptable and responsive to the rapidly evolving digital landscape. The evidence suggests that while AI can significantly enhance the learning experience through personalized and engaging educational content, it also raises substantial challenges in terms of equitable access and the digital divide. This resonates with findings from Kryshtanovych et al. (2021), who emphasize creativity in AI-enhanced education. It underscores the necessity for economic policies that not only foster innovation but also ensure that such innovations are accessible across diverse educational landscapes, preventing a stratification in educational quality. The legal aspect of our study reveals complexities in data privacy and protection that are paramount when deploying AI technologies. The need for robust legal frameworks that specifically address the nuances of AI-driven data collection and usage in education aligns with Alazzam et al.'s (2023) insights on legal compliance in digital platforms. Our research suggests that existing data protection laws may need substantial revisions to accommodate the unique challenges posed by AI, ensuring that student data is safeguarded against misuse and breaches.

CONCLUSIONS

The research conducted on the economic and legal regulation of technologies based on artificial intelligence (AI) in the context of distance learning has culminated in several critical insights and recommendations. This chapter synthesizes the conclusions drawn from the study and outlines the implications for policymakers, educators, and legal professionals involved in the deployment of AI technologies in educational settings.

The functional model developed using the IDEF0 methodology has provided a systematic and detailed analysis of the current regulatory framework governing AI technologies in distance education. This model has proven effective in identifying the key economic and legal issues that must be addressed to optimize the use of AI in this sector. It has highlighted areas where regulatory measures either lack sufficient detail or are overly restrictive, potentially stifling innovation and adaptation in educational technologies.

Economically, the study emphasizes the necessity for creating supportive policies that not only foster innovation and growth within the educational technology sector but also ensure equitable access to these resources. It became evident that there is a significant need for investment in infrastructure that can support the widespread adoption of AI technologies, particularly in under-resourced areas. Additionally, the economic analysis suggests that current funding models need to be adjusted to better accommodate the ongoing costs of AI technology updates and maintenance.

Legally, the research has revealed the complexity of managing data privacy, intellectual property, and ethical considerations unique to AI in education. The study advocates for clearer, more comprehensive legal guidelines that can keep pace with the rapid advancement of technology. This includes specific recommendations for amendments to data protection laws to better safeguard student information and more precise definitions of intellectual property rights concerning AI-generated educational content. The research suggests several areas for future exploration, particularly the socio-psychological impacts of AI in education, which could significantly influence regulatory needs and educational outcomes. Further studies could also explore international cooperation in standard-setting to manage the global nature of digital education and AI technology.

In conclusion, the economic and legal regulation of AI in distance learning requires a proactive, nuanced approach that balances the need for innovation with the necessity of safeguarding ethical standards and equitable access. This study lays a foundation for such efforts and calls for continued, focused dialogue and development in this rapidly evolving field.

REFERENCES

Abdullah, W. M. Z. B. W., Zainudin, W. N. R. A. B., Ismail, S. B., & Zia-Ul-Haq, H. M. (2022). The Impact of Microfinance Services on Malaysian B40 Households' Socioeconomic Performance: A Moderated Mediation Analysis. International Journal of Sustainable Development and Planning, 17(6), 1983–1996.

Anne Karani Iswan, Dr. Robert Blikhar, M., Vinichuk, M., Kashchuk, M., Gapchich, V., Babii , S. (2023). Economic and legal aspects of ensuring the effectiveness of counteracting corruption in the system of anti-corruption measures of state authorities. Financial and Credit Activity Problems of Theory and Practice, 4(51): 398-407. https://doi.org/10.55643/fcaptp.4.51.2023.4138

Alazzam, F. A. F., Tubishat, B. M. A.-R., Savchenko, O., Pitel, N., & Diuk, O. (2023). Formation of an innovative model for the development of e-commerce as part of ensuring business economic security. Business: Theory and Practice, 24(2), 594–603. https://doi.org/10.3846/btp.2023.19781

Alazzam, F. A. F., Tubishat, B. M. A.-R., Storozhuk, O., Poplavska, O., & Zhyvko, Z. (2024). Methodical approach to the choice of a business management strategy within the framework of a change in commercial activities. Business: Theory and Practice, 25(1), 1–10. https://doi.org/10.3846/btp.2024.19676

Alazzam, F.A.F., Aldrou, K.K.A.R., Berezivskyy, Z., Zaverbnyj, A., Borutska, Y. (2023). State management of the system of rational environmental use in the context of commercial development of the bioeconomy: Ecological aspect. International Journal of Environmental Impacts, Vol. 6, No. 4, pp. 155-163. https://doi.org/10.18280/ijei.060401

Alazzam, F.A.F., Shakhatreh, H.J.M., Gharaibeh, Z.I.Y., Didiuk, I., Sylkin, O. (2023). Developing an information model for E-Commerce platforms: A study on modern socio-economic systems in the context of global digitalization and legal compliance. Ingénierie des Systèmes d'Information, Vol. 28, No. 4, pp. 969-974. https://doi.org/10.18280/isi.280417

Bani-Meqdad, M.A.M., Senyk, P., Udod, M., Pylypenko, T., Sylkin, O. (2024). Cyber-environment in the human rights system: Modern challenges to protect intellectual property law and ensure sustainable development of the region. International Journal of Sustainable Development and Planning, Vol. 19, No. 4, pp. 1389-1396. https://doi.org/10.18280/ijsdp.190416

Kopytko, M., & Sylkin, O. (2023). Modelling information support for combating corruption in the economic security management system of the state. Social and Legal Studios, 6(3), 60-66. https://doi.org/10.32518/sals3.2023.60

Kryshtanovych, M., Bilyk, V., Hanushchyn, S., Sheremet, I., & Vasylenko, K. (2021). Modelling the ways to increase the creativity of psychology students as a basic factor in professional development. Creativity Studies, 14(1), 34-50. https://doi.org/10.3846/cs.2021.12571

Kryshtanovych, M., Kryshtanovych, S., Stepanenko, L., Brodiuk, Y., & Fast, A. (2021). Methodological approach to determining the main factors for the development of creative thinking in students of creative professions. Creativity Studies, 14(2), 391-404. https://doi.org/10.3846/cs.2021.14806

Kryshtanovych, S., Chubinska, N., Gavrysh, I., Khltobina, O., & Shevchenko, Z.. (2021). Philosophical and Psychological Approach to Self-Development of Scientific and Pedagogical Workers. WISDOM, 20(4), 139-147. https://doi.org/10.24234/wisdom.v20i4.560

Kwon, J. (2023). A study on ethical awareness changes and education in artificial intelligence society. Revue d'Intelligence Artificielle, Vol. 37, No. 2, pp. 341-345. https://doi.org/10.18280/ria.370212

Saleh, A.J., Alazzam, F.A.F., Aldrou, K.K.A.R., Zavalna, Z. (2020). Legal aspects of the management of cryptocurrency assets in the national security system. Journal of Security and Sustainability Issues, 10(1): 235-247. https://doi.org/10.9770/jssi.2020.10.1(17)

Alazzam, F.A.F., Salih, A.J., Amoush, M.A.M., Khasawneh, F.S.A. (2023). The nature of electronic contracts using blockchain technology - Currency bitcoin as an example. Revista De Gestão Social E Ambiental, 17(5): e03330. https://doi.org/10.24857/rgsa.v17n5-014

Sylkin, O., Shtangret, A., Ogirko, O., Melnikov, A. (2018). Assessing the financial security of the engineering enterprises as preconditions of application of anti-crisis management: Practical aspect. Business and Economic Horizons, 14(4): 926-940. https://doi.org/10.15208/beh.2018.63

Arasa, D. J. N. (2020). The Role of Financial Literacy in the Growth of Women Owned Micro Enterprises: A Case Study of Busia County, Kenya By. Journal of African Interdisciplinary Studies (JAIS): ISSN 2523-6725, 4(12), 16–27.

Bernard, D. T. K. (2020). Entrepreneurial Success for Women through Microfinance and Effect of Education: Evidence from Sri Lankan. Journal of Economics and Business, 3(3).

Carlos, J., Mejía, U., Gutierrez, L. H., & Rodríguez, P. (2023). Financial inclusion and business practices of microbusiness in Colombia. Eurasian Business Review, (0123456789).

Hair, Joe F, Risher, J. J., Sarstedt, M., & Ringle, C. M. (2018). The Results of PLS-SEM Article information. European Business Review, 31(1), 2–24.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1), 2–24.

Hammawa, Y. M., & Bappi, U. (2019). Towards Improving the Performance of Women Entrepreneurs in Micro Enterprise in Nigeria, 3(1), 47–65.

Megan Lang, J. S. (2022). The Economics of Women's Entrepreneurship, 1–45.

Sawad, B. (2022). Effect Of Microfinance On Entrepreneurship Development: A Case Study Of Kanchanpur District By:, (8.5.2017), 2003–2005.

Tarisha, A., Ardi, K. H., Fatkhurrahman, I. N., & Margaretha, F. (2021). Financial Literacy on Saving Behavior in MSMEs with Social Influence as an Intervening Variable. Oktober, 5(2), 24–37.