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Частина 1

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DIGITAL TRANSFORMATION OF HIGHER EDUCATION IN UKRAINE

The relevance of the study is determined by the need to adapt the national education system to rapid changes in the world of technology and the information society. In today's globalised world, where information technologies are constantly evolving, higher education institutions (HEIs) face challenges related to the need to integrate these technologies to improve the quality of education, attract students and increase the effectiveness of the learning process. Technological innovations open up new opportunities for learning and teaching, including the use of electronic resources, online platforms, artificial intelligence, and other digital tools. This creates a need to study their impact on the educational process and identify effective strategies for implementing and managing these technologies. In addition, changing labour market requirements and the emergence of new professions are prompting higher education institutions to review their curricula and methodologies in order to train qualified specialists capable of working in the digital economy. Therefore, this study is relevant for determining the role and impact of modern technologies on innovative changes in higher education, as well as for developing recommendations for the effective implementation and management of these changes.

The aim of the study is to analyse and evaluate the role of modern technologies in the process of implementing and managing innovative changes in higher education institutions. The study seeks to identify how the latest technological solutions can contribute to the effectiveness of educational innovations, improve the quality of education, and develop the institutional and organisational aspects of education. Research objectives:– to assess how the use of various technological tools affects the pedagogical, infrastructural and organisational aspects of education;– to develop recommendations for the effective implementation and management of technologies in higher education; – formulate forecasts for the future development and impact of technologies on innovation processes in higher education.

In order to be recognised as innovative, a modern higher education institution must transform itself from an ordinary academic centre into a unique university complex – an educational, scientific and innovative complex. This complex must develop scientific and innovative activities, create the necessary infrastructure to support these processes, and ensure close interaction between educational, scientific, and innovative activities. However, it is impossible to discuss the innovative development of higher education institutions without taking into account the development and implementation of an innovation strategy, which is a key element of the strategic process of innovation management. We would like to put forward several proposals to improve the process of digitisation of education in Ukraine, in particular, strengthening fundamental science and the development of domestic technology production, including the development of 3D printers,

robots and technical devices, and the active use of artificial intelligence. It is necessary to create conditions for the development of businesses related to digitalisation through incentives, stimuli and social benefits; to train personnel for the digital economy; to work with the country's higher education institutions to develop new educational programmes and teaching methods; modernise IT infrastructure by updating technical equipment and ensuring citizens' access to digital resources. In the context of considering HEIs as knowledge corporations, we propose methods for activating the management and development of innovative activities, which are illustrated in Fig. 1. Internal methods for stimulating innovation in higher education institutions often overlap with the programmes of infrastructure centres 1.0 and national technology initiative platforms such as AutoNet, AeroNet, HealthNet, EnergyNet, TechNet, and NeuroNet.

The application of the concept of sharing in digital platforms is particularly important for e–libraries, which, through subscription, provide access to a large amount of electronic information from e–publishers without the need to own all printed copies of such materials; this trend is also important for the creation of appropriate ecosystems. In this study, we focus on examining the degree of sharing of such materials; this trend is also important for the creation of appropriate ecosystems. copies of such materials; this trend is also important for the creation of relevant ecosystems. In this study, we focus on examining the degree of virtualisation and digitisation in HEIs. Based on our description of the digitisation process in HEIs, we can identify the potential of digital platforms and resources in the innovative activities of educational institutions, taking into account virtualisation and uberisation Information portals that partner with digital educational platforms help promote teachers' publications on the Ukrainian educational market, using various promotions and opportunities, which emphasises the specialisation of participants in the process of digitising higher education institutions.

In a more global context, the development of a digital ecosystem is relevant. Such an ecosystem can change our understanding of basic human values, including attitudes towards work and wealth. Accordingly, the higher education system must constantly adapt to these changing needs. Furthermore, the application of artificial intelligence algorithms has the potential to significantly improve the educational sphere, making it relevant to modern realities. It is important to distinguish between the macro and micro levels of artificial intelligence use in the higher education system. This includes assessing the costs of implementing artificial intelligence in the educational process, both at the national level and at the level of individual educational institutions, such as universities. At the same time, it is necessary to compare the costs and benefits of using artificial intelligence in the higher education system in order to make appropriate decisions. With regard to the creation of a cloud–oriented educational environment in higher education institutions, it is advisable to apply a hybrid service model of its structure. This model includes educational cloud services and electronic management resources available to users through cloud hosting. This means that resources are stored on virtual servers located in data centres or on virtual cloud servers, which involves a hybrid approach to the use of server capacity.

The application of artificial intelligence tools in innovative management of higher education institutions can be analysed by implementation subjects: a) administration–oriented; b) teacher–oriented; c) oriented towards the general system of artificial intelligence in the educational process. Some AI programmes are already actively used in the Ukrainian higher education system. The approach to HEI management includes strategies and tools for collecting and updating development plans and documents, teaching materials, their joint creation and exchange, as well as for continuous interaction between the innovative activities of companies and the educational activities of HEIs. Using this approach, HEIs, as economic entities, can use the achievements of the digitalisation of society to develop new courses and create innovations. Effective digitalisation of the economy and education is only possible if an interactive system is created, where each component works together to achieve a common goal.

It has been determined that information and communication technologies are transforming the field of education in three main areas: pedagogical, infrastructural, and organisational. These changes represent a modern approach to education based on the use of information technologies. In the context of the development of information and communication technologies and their implementation in education, the emergence and development of education based on these technologies, as well as online education as its modern form, are logical and expected. It is expected that in the future there will be an increase in the diversity of forms and scope of use of such education. Effective management of higher education institutions based on information technologies is possible provided that this format of education is consciously chosen for specific users, has specific content, is based on appropriate methodology and approaches, interesting content, student motivation and effective software and technical support. In addition, tools have been optimised to increase the innovative activity of universities as centres of knowledge, including external and internal aspects that are important for the digital economy. The motivation of university lecturers and researchers in the context of digitalisation has been analysed on the basis of existing assessment systems; the use of design thinking tools to create educational innovations based on human–centred principles and socially significant projects has also been considered.

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МОДЕЛЮВАННЯ ОЦІНЮВАННЯ ІННОВАЦІЙНОЇ ВЗАЄМОДІЇ У ЗМІШАНОМУ НАВЧАННІ МАТЕМАТИЧОЇ ОСВІТНЬОЇ ГАЛУЗІ ПОЧАТКОВОЇ ОСВІТИ

Ключові слова: інноваційна взаємодія, оцінювання, математична освітня галузь, початкова освіта, змішане навчання, таксономія Блума, Нова українська школа, цифрові технології.

Поставлення проблеми. Динамічний розвиток цифрових технологій, соціально–економічні трансформації та виклики глобалізації, посилені пандемією COVID–19 та воєнними діями в Україні, вимагають від системи початкової освіти постійного оновлення та впровадження інновацій у процесі підготовки вчителів початкової школи, зокрема в математичній освітній галузі. Однак, різноманітність інноваційних підходів, їх складність та контекстуальна залежність ускладнюють процес оцінювання ефективності взаємодії між суб'єктами освітнього процесу – викладачами та майбутніми учителями початкових класів. Це зумовлює необхідність переходу до суб'єкт–суб'єктних форм оцінювання взаємодії в умовах змішаного навчання, що постає інструментом взаємного контролю, корекції та мотивації, сприяючи професійній готовності майбутніх учителів до інноваційної діяльності.

Мета дослідження – побудова теоретичної моделі оцінювання інноваційної взаємодії в процесі підготовки майбутніх учителів початкових класів до викладання математичної освітньої галузі в умовах змішаного навчання

Результати дослідження. Сучасна система початкової освіти в Україні, реформована відповідно до Концепції Нової української школи (НУШ), акцентує увагу на компетентнісному підході, де математична освітня галузь відіграє ключову роль