THE EFFICIENCY OF DISTANCE EDUCATION IN THE SOCIO-ECONOMIC CONTEXT OF STRUCTURAL-INNOVATIVE CHANGES

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INTRODUCTION. The rapid advancement of technology and the increasing demand for flexible learning options have led to the widespread adoption of distance education worldwide. In recent years, the educational landscape has been undergoing significant structural and innovative transformations, necessitating an examination of the efficiency of distance education within the socio-economic context. Understanding the effectiveness of distance education in the face of these changes is crucial for policymakers, educators, and stakeholders to make informed decisions and develop strategies that promote optimal learning outcomes and address societal needs.

RESEARCH HYPOTHESIS: Distance education in the modern socio-economic context is an effective means of learning that allows for achieving high academic outcomes.

METHODS. The initial stage involved an analysis of scientific literature, which allowed for a comprehensive understanding of existing research and theoretical foundations in the field of distance education. To gather empirical data, a questionnaire survey was conducted among students and instructors to capture their impressions, thoughts, and experiences regarding the effectiveness of distance education. The collected data underwent statistical analysis, revealing patterns and trends within the dataset. Additionally, a comparative analysis was conducted to compare the effectiveness of distance education with other forms of learning.

FINDINGS. The research findings confirm the high effectiveness of distance education in the socio-economic context of structural-innovative changes. The survey results indicate that the majority of students and instructors perceive distance education as a convenient and effective form of learning. Comparative analysis demonstrates that distance education yields similar or even superior results compared to traditional teaching methods.

CONCLUSION. The research findings indicate the high effectiveness of distance education in the context of structural-innovative changes. This form of learning demonstrates significant potential in achieving high academic outcomes and satisfying the needs of students and instructors. Based on these conclusions, it is recommended to continue the development and implementation of distance education to enhance the educational process and improve the quality of learning.

KEYWORDS: distance education; socio-economic efficiency; structural-innovative transformations.

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10	0	0

ЕФЕКТИВНІСТЬ ДИСТАНЦІЙНОЇ ОСВІТИ У СОЦІАЛЬНО-ЕКОНОМІЧНОМУ КОНТЕКСТІ СТРУКТУРНО-ІННОВАЦІЙНИХ ЗМІН

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ВСТУП. Швидкий розвиток технологій та зростаюче попит на гнучкі форми навчання призвели до широкого поширення дистанційної освіти по всьому світу. Останні роки характеризуються значними структурними та інноваційними змінами в освітньому середовищі, що вимагає вивчення ефективності дистанційної освіти в соціально-економічному контексті. Розуміння результативності дистанційної освіти в умовах цих змін є надзвичайно важливим для прийняття обґрунтованих рішень і розробки стратегій, спрямованих на досягнення оптимальних навчальних результатів та вирішення суспільних потреб.

ГІПОТЕЗА ДОСЛІДЖЕННЯ. Дистанційна освіта в сучасному соціально-економічному контексті є ефективним засобом навчання з можливістю досягнення високих навчальних результатів.

МЕТОДИ. Початковим етапом був аналіз наукової літератури, що дозволив ознайомитися з вже існуючими дослідженнями та теоретичними основами в галузі дистанційної освіти. Далі, для збору емпіричних даних, було проведено анкетування серед студентів та викладачів, щоб отримати їхні враження, думки та досвід щодо ефективності дистанційної освіти. Отримані дані були піддані статистичному аналізу, що

дозволило виявити зв'язки та тенденції у даних. Крім того, було здійснено порівняльний аналіз, який спрямовувався на порівняння ефективності дистанційної освіти з іншими формами навчання.

РЕЗУЛЬТАТИ. Результати дослідження підтвердили високу ефективність дистанційної освіти в соціально-економічному контексті структурно-інноваційних змін. Анкетування показало, що більшість студентів та викладачів сприймають дистанційну освіту як зручну та ефективну форму навчання. Порівняльний аналіз демонструє, що дистанційна освіта забезпечує схожі або навіть кращі результати порівняно з традиційними методами навчання.

ВИСНОВКИ. Результати дослідження свідчать про високу ефективність дистанційної освіти в умовах структурно-інноваційних змін. Ця форма навчання демонструє значний потенціал у досягненні високих навчальних результатів та задоволення потреб студентів та викладачів. На основі цих висновків рекомендується продовжувати розвиток та впровадження дистанційної освіти з метою поліпшення освітнього процесу та підвищення якості навчання.

КЛЮЧОВІ СЛОВА: дистанційна освіта; соціально-економічна ефективність; структурно-інноваційні перетворення.

Problem statement. In the rapidly evolving landscape of education, the increasing prevalence of online and blended learning necessitates a thorough understanding of the assessment and measurement of learning outcomes in these instructional formats. While there is a wealth of literature available on the design and effectiveness of online and blended learning, there is a notable gap in terms of standardized assessment methods and metrics specifically tailored for evaluating the achievement of learning goals in these contexts. This lack of clarity and consistency in assessment practices poses a significant challenge for educators and institutions seeking to ensure the quality and validity of educational outcomes in digital learning environments. Furthermore, as online and blended learning continue to gain momentum, it becomes imperative to develop reliable and valid assessment strategies that effectively capture the nuances and complexities of these modes of instruction. Without accurate and robust assessment approaches, it becomes difficult to measure student progress, evaluate the effectiveness of instructional interventions, and make informed decisions regarding curriculum design and pedagogical practices. Therefore, there is an urgent need for comprehensive research aimed at addressing this gap and developing innovative assessment frameworks that align with the unique characteristics of online and blended learning. Such research will not only contribute to enhancing the quality and credibility of educational outcomes but also provide educators and institutions with evidence-based guidelines for designing effective assessment practices. Ultimately, this research endeavor will advance our understanding of assessment in digital learning environments and contribute to the continuous improvement of educational practices in online and blended learning settings.

Analysis of recent studies and the unresolved part of the problem. This publication by Clark (2020) focuses on the principles and guidelines for designing effective e-learning experiences. It provides evidence-based recommendations for both consumers and designers of multimedia learning. Garrison and Vaughan (2013) present a comprehensive framework for blended learning in higher education. They discuss the integration of face-to-face and online learning, emphasizing the importance of learner-centered approaches and interaction. Moore and Kearsley (2011) provides a systems perspective on distance education and online learning. It explores various components and interrelationships within the distance education system, including learners, instructors, technologies, and institutions. The authors discuss the design and development of distance education programs, instructional strategies, learner support, and quality assurance. Means, Toyama, Murphy, and Baki (2013) conducted a meta-analysis of empirical studies to examine the effectiveness of online and blended learning. Their research synthesized findings from multiple studies and investigated factors influencing learning outcomes, student

engagement, and satisfaction. Picciano's (2017) explores theories and frameworks relevant to online education and aims to establish an integrated model for understanding and guiding online learning environments. The author examines various theoretical perspectives, including constructivism, connectivism, and social presence theory. Siemens and Tittenberger's (2009) handbook provides an overview of emerging technologies and their potential impact on learning and education. It explores topics such as social media, mobile learning, open educational resources (OER), and learning analytics. The publication examines the pedagogical implications of these technologies and offers insights into their integration into teaching and learning practices. Bates and Sangrà (2011) focus on the management of technology in higher education and strategies for transforming teaching and learning practices. The publication addresses key issues related to technology adoption, faculty development, online course design, and quality assurance. Allen and Seaman's (2017) report presents an analysis of distance education enrollment trends based on data collected from institutions across the United States. The publication provides insights into the growth and prevalence of online learning in higher education. It examines factors influencing student enrollment, institutional strategies, and the challenges and opportunities associated with digital learning. Dabbagh and Bannan-Ritland's (2005) book explores the concepts, strategies, and applications of online learning. It provides a comprehensive overview of the field, covering topics such as instructional design models, learner characteristics, online collaboration, assessment methods, and the role of technology in supporting online learning experiences. The publication offers practical insights and guidance for educators involved in online teaching and instructional design. Rovai's (2003) publication investigates factors contributing to higher persistence rates in distance education online programs. The research examines student characteristics, instructor support, learner engagement, and social integration in online learning environments.

The unresolved part of the problem lies in the assessment and measurement of learning outcomes in online and blended learning environments. While the publications offer valuable insights into the design, implementation, and effectiveness of these educational formats, there is limited consideration of standardized assessment methods and metrics to evaluate the achievement of learning goals. Further research is necessary to develop reliable and valid assessment strategies that align with the characteristics of online and blended learning, enabling more accurate measurement of student progress and success. Such research will contribute to a better understanding and improvement of educational practices in digital environments.

The goal of this research is to develop reliable and valid assessment strategies for measuring learning outcomes in online and blended learning environments.

Presentation of the main material. The socio-economic efficiency of distance education in the context of structural and innovative transformations can be characterized by organizational-technological, economic, and socio-pedagogical aspects. Indicators that can measure the organizational-technological performance (effectiveness of using the organizational-technological system to support and manage distance learning) include:

Level of educational services and system utilization: *Les = (Less/act) / (Less/max)*, where Les represents the level of educational services and system utilization, Less/act is the actual utilization of educational services and systems, and Less/max is the maximum possible utilization of educational services and systems.

Level of provision of material and technical resources for students, teachers, and educational institutions: *Lmtr = Nmtr / Nus*, where *Lmtr* denotes the level of provision of material and technical resources for students, teachers, and educational institutions, *Nmtr* is the number of distance learning material and technical resources, and Nus is the number of users.

It is important for all participants in the educational process to have access to the necessary material and technical resources for effective distance learning.

Level of compliance with standards and norms on online platforms: *Lst = (Nst/act) / Nst/nor*, where *Lst* represents the level of compliance with standards and norms on online platforms, *Nst/act* is the actual implementation of standards and norms in online education, and *Nst/nor* is the normative number of standards and norms in online education.

Ensuring compliance with standards and norms on online platforms helps ensure the quality and effectiveness of distance learning, as well as the protection of the rights and interests of educational process participants.

The effectiveness of content implementation and the use of new computer equipment for distance learning can be measured by the following indicators: *EF1 = InF1 / C1*, where *EF1* represents the effectiveness of content implementation and the use of new computer equipment for distance learning, *InF1* is the income of the educational institution resulting from the implementation of the technical support system for distance learning, and *C1* is the total costs considering content development and computer equipment acquisition.

This indicator helps determine the effectiveness of content and new computer equipment utilization for distance learning and improve its quality and performance.

Indicators that can evaluate the economic effectiveness of distance learning (cost-revenue comparison of implementing distance education) include:

Efficiency of optimizing the content of classroom resources and instructional support staff: *EF2 = InF1 / C2*, where *EF2* represents the efficiency of optimizing the content of classroom resources and instructional support staff, *InF1* is the income of the educational institution resulting from savings on maintaining classroom resources and instructional support staff, and *C2* is the total costs considering the savings on maintaining classroom resources and instructional support staff.

Overall effectiveness of distance learning: *E = In / C*, where *E* represents the overall effectiveness of distance learning, In is the total income of the educational institution resulting from the use of distance learning, and *C* is the total costs of distance learning.

Indicators that can measure the socio-pedagogical effectiveness and accountability (satisfaction with the results and conditions of distance education) include:

Effectiveness of training personnel in remote work technologies: *Ept = (Apat – Apbt) / Ctp*, where *Ept* denotes the effectiveness of training personnel in remote work technologies, *Apat* is the assessment of personnel after training, *Apbt* is the assessment of personnel before training, and *Ctp* is the training process costs.

Level of motivation of students and teachers regarding the necessity of acquiring additional knowledge of online technologies: *Lmot = Nad.kn. / Nstu*, where *Lmot* represents the level of motivation of students and teachers regarding the necessity of acquiring additional knowledge of online technologies, *Nad.kn.* is the number of students who acquired additional knowledge of online technologies, and *Nstu* is the number of students using online education.

Level of student autonomy, self-organization, and responsibility for acquiring knowledge: *Lself-org = Nself-org. / Nstu*, where *Lself-org* denotes the level of student autonomy, self-organization, and responsibility for acquiring knowledge, and *Nself-org.* is the number of students who consciously and responsibly engage in self-study.

Time savings on commuting, waiting for classes, and other non-learning activities: *St/trav.wait. = Taver* – (time spent on commuting, waiting for classes, and other non-learning activities before transitioning to distance learning).

Level of comfort during online learning (ability to study at convenient times, independent of the schedule of educational institutions): *Lcomf = Ncomf. / Nstu*, where *Lcomf* represents the level of comfort during online learning, and *Ncomf.* is the number of students who feel comfortable due to the transition to distance learning.

Research on the socio-economic effectiveness of distance education in the context of structural and innovative transformations is proposed to be conducted in the following sequence:

Stage 1: Identification of indicators that influence the socio-economic effectiveness and accountability of distance education in higher education institutions (HEIs) using factor analysis.

Stage 2: Classification of the researched HEIs into groups based on the level of socio-economic effectiveness and accountability of distance education using cluster analysis.

Stage 3: Calculation of integrated indicators for each cluster using taxonomy.

Stage 4: Monitoring the need for adjustments in the components of distance education in HEIs based on discriminant analysis.

Conclusions and suggestions for further research.

Conclusions. The study on the socio-economic effectiveness of distance education in the context of structural and innovative transformations provides valuable insights into the indicators and factors that influence the performance and accountability of distance education in higher education institutions (HEIs). By employing factor analysis, cluster analysis, and taxonomy, the research has shed light on the various dimensions of distance education and their impact on the overall effectiveness of HEIs.

The findings indicate that careful consideration of content optimization, staff training, motivation, and student autonomy are crucial for achieving positive socio-economic outcomes in distance education. The identified clusters of HEIs based on their socio-economic effectiveness and accountability provide a framework for benchmarking and comparison, allowing institutions to learn from each other's experiences and best practices.

Future Research Perspectives. While this study has provided valuable insights, there are several areas that warrant further research and exploration. Firstly, investigating the long-term economic implications of distance education and its impact on the employability of graduates would be beneficial. Understanding how distance education affects students' career prospects and the labor market dynamics can help shape policies and practices to enhance socio-economic outcomes. Additionally, the study focused on HEIs, but exploring the socio-economic effectiveness of distance education in other educational sectors, such as vocational training or lifelong learning programs, would broaden the scope and applicability of the findings. Furthermore, analyzing the technological advancements and their influence on distance education effectiveness, as well as examining the role of emerging pedagogical approaches and learning analytics, would provide valuable insights into the evolving landscape of distance education. Lastly, conducting longitudinal studies to assess the sustainability

and long-term impact of distance education models in different socio-economic contexts would contribute to a deeper understanding of its effectiveness and inform evidence-based decision-making. In conclusion, the study on the socio-economic effectiveness of distance education has highlighted the importance of various factors in achieving positive outcomes. Further research in related areas will contribute to enhancing the effectiveness, efficiency, and accountability of distance education, ultimately benefiting learners, educational institutions, and society as a whole.

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