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EDUCATIONAL DIMENSION OF SUSTAINABLE DEVELOPMENT: ANALYTICAL REVIEW

The United Nations' Sustainable Development Goal 4 (SDG4) aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all by 2030. This ambitious agenda requires rigorous research across diverse educational domains to inform effective policies and practices. This paper reviews 106 articles published in the Educational Dimension journal from 2019 to 2023, analysing their relevance to the ten targets under SDG4. The analysis reveals that the journal has significantly contributed to discourses surrounding integrating emerging technologies in education, curriculum design, teaching methodologies, and professional development of educators. However, gaps are identified in addressing specific targets, such as expanding scholarship programs, promoting education for sustainable development and global citizenship, and addressing the needs of marginalised groups. The review also highlights a need for more geographical diversity and interdisciplinary approaches in the published research. While the Educational Dimension journal has made notable contributions, the findings underscore the need for broader collaborations, diverse research lenses, and context-specific insights to comprehensively support the achievement of SDG4 globally. The paper concludes by emphasising the crucial role of academic journals in advancing quality education research and evidence-based policymaking for sustainable development.

Keywords: *education, educational quality, lifelong learning, literature review, SDG4, sustainable development.*

INTRODUCTION

The 2030 Agenda for Sustainable Development adopted by the United Nations identifies education as a critical enabler for sustainable development. Sustainable Development Goal 4 (SDG4) focuses on providing quality education and promoting lifelong learning opportunities for all (Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4, 2015, p. 43–46). It encompasses ten targets ranging from pre-primary education and literacy to technical and vocational skills development.

Achieving the ambitious SDG4 targets requires high-quality research to inform evidence-based educational policies and practices. Journals play a vital role in disseminating such research and furthering discourse on education for sustainable development. This paper reviews articles published in the *Educational Dimension* journal relevant to the SDG4 targets.

Educational Dimension is an open-access, peer-reviewed journal that encompasses empirical studies as well as systematic reviews and meta-analyses spanning diverse aspects of education (Bondarenko et al., 2019). The journal was selected for this review because its scope aligns well with the focus of SDG4 on ensuring inclusive and equitable quality education while promoting lifelong learning opportunities for all. Published semi-annually by the Academy of Cognitive and Natural Science (ACNS) since 2019, the journal has a steadily growing publication volume. It has also been indexed in scholarly databases like ERIH-PLUS since 2021.

Focusing specifically on the *Educational Dimension* journal, this review aims to thoroughly survey and synthesise the contributions of articles published within this scholarly publication over the past few years. The findings will reveal how much this journal has addressed aspects of SDG4 through high-quality research. Reviewing articles across multiple journals was out of the scope of this paper. Conducting a systematic review across journals can be an area for further research to understand the broader landscape of education research on sustainable development.

METHODOLOGY

The articles for this review were retrieved from the ERIH PLUS by Dimensions database using a keyword search. Dimensions is a linked research database that provides access to over 102 million publications across multiple disciplines (Herzog et al., 2020) – using this comprehensive database allowed for the thorough identification of relevant articles on SDG4 published in the *Educational Dimension* journal.

The search query included the following terms: «SDG4», «education», «sustainable development», «lifelong learning», «teacher training», «inclusive», «equality», and other keywords representing the targets of SDG4. Articles published in the *Educational Dimension* journal between 2019 (inception) and December 2023 were searched.

This process yielded 106 articles relevant to the various targets of SDG4. The articles were carefully read and analysed to identify the specific SDG4 targets they addressed. A spreadsheet was created to categorise the articles based on the targets.

For each article, key information was captured: authors, year of publication, title, target(s) covered, methodology, sample size (if applicable), key findings, and implications for SDG4. The contributions of the articles were critically examined in relation to the ambitions articulated in the SDG4 targets.

The articles were grouped according to the SDG4 targets they corresponded to synthesise the findings. The targets that needed to be adequately addressed were also noted. This categorisation provided an organised overview of how the articles published in *Educational Dimension* have collectively addressed the different aspects of SDG4. The variability in topics, methodologies, and education levels covered was assessed.

The review methodology enabled a structured analysis of the articles, unpacking their relevance to SDG4 targets and their global implications for advancing quality education. The findings provided insights into the current research gaps, which will be valuable for steering future studies on sustainable education.

RESULTS AND DISCUSSION

The analysis found articles covering the following SDG4 targets (UNESCO Institute for Statistics, 2023).

SDG4.1 – Primary and secondary education.

The studies identified provide insights into enhancing the quality of primary and secondary education through innovative pedagogical approaches, curriculum design, and integration of educational

technologies.

The study by O. Vasko and O. Bilier (2023) proposes effective strategies for delivering online lectures to pre-service primary school teachers. By exploring interactive features, engagement techniques, and reflective practices in online lecture design, this research contributes to improving teacher training programs, ultimately enhancing the quality of primary education delivery.

Focusing on developing computational thinking early, N. Morze et al. (2022) demonstrate the need to incorporate digital tools and open educational resources in primary education curricula. Their findings highlight opportunities to foster essential 21st-century skills among young learners.

P. Nechypurenko et al. (2023) present an augmented reality virtual chemistry lab to enrich secondary science education. Through visualisations and interactive simulations, this cloud-based tool can potentially boost student engagement and conceptual understanding of chemistry.

N. Prykhodkina and T. Makhynia (2020) provide a comparative analysis of social media integration in school management between Ukraine and the USA. While limited in Ukraine, the study reveals the potential of social media to facilitate communication and collaboration and enhance the overall quality of secondary education experiences.

A. Tokarieva et al. (2019) explore using educational digital games as instructional tools, highlighting their ability to cater to diverse learning styles, incorporate assistive features, and create engaging learning environments, aligning with principles of inclusive quality education.

Through bibliometric analysis, L. Fadieieva (2023) maps research on adaptive learning in social sciences, offering insights into personalised and tailored educational approaches that can support primary and secondary students' needs.

The studies by O. Kucheriavyi (2022) and O. Pylypenko (2020) underscore the importance of nurturing critical thinking, problem-solving, and creativity from an early age, contributing to the overall effectiveness of primary and secondary education in fostering essential life skills.

While these studies contribute valuable perspectives, further research is needed to assess the direct impact of such interventions on measurable learning outcomes and develop a comprehensive framework for delivering high-quality, inclusive, and future-ready primary and secondary education globally.

SDG4.2 – Early childhood development and pre-primary education.

Quality early childhood education lays the foundation for lifelong learning and achievement. The few studies in this review provide glimpses into innovative approaches and assessment tools that can potentially enhance pre-primary learning experiences.

O. Piatykop et al. (2022) developed an augmented reality mobile application to teach young children the alphabet, numbers, and animal sounds. Testing results demonstrated increased engagement, motivation, and learning outcomes, showcasing the potential of educational technology in early literacy and numeracy development.

O. Horbachova et al. (2022) created a diagnostic tool to assess school readiness among preschoolers by evaluating their value-semantic preparedness for learning. This assessment methodology can help identify areas for intervention before transitioning to primary education, ensuring children are adequately prepared.

While these studies provide examples of leveraging technology and assessments to improve early childhood education, more comprehensive research is critically needed. Potential areas for further investigation include:

- developing and evaluating play-based, interactive curricula aligned with holistic child development goals;
- examining the impact of parental involvement and home learning environments on early learning outcomes;
- exploring strategies for promoting inclusive, equitable access to quality pre-primary education, especially for marginalised communities;
- assessing the effectiveness of early childhood educator training programs in imparting essential pedagogical skills;
- investigating the role of community-based early childhood initiatives in complementing formal pre-primary education systems.

By addressing these research gaps, the global community can gain deeper insights into designing and implementing high-quality, accessible early childhood education programs that effectively prepare all children for primary school and lifelong learning.

SDG4.3 – Equal access to technical/vocational/tertiary education.

Ensuring equitable access to quality technical, vocational, and tertiary education is pivotal for empowering individuals, fostering economic growth, and promoting sustainable development. The studies reviewed shed light on various aspects of enhancing access, quality, and relevance of higher education programs.

I. Yarhere and T. Chinnah (2023) assessed disparities in medical education curricula across universities in Southern Nigeria, highlighting the need for standardised templates to ensure consistent quality and equitable access to quality tertiary education.

O. Buinytska and S. Vasylenko (2022) described an internal certification system for e-learning courses at a Ukrainian university, demonstrating efforts to maintain quality standards while expanding access through online and blended learning modalities.

A. Striuk (2021) proposed integrating cloud-based tools into software engineering programs, exemplifying how educational technologies can facilitate ubiquitous access to quality technical education and foster collaborative learning experiences.

Several studies, including those by O. Lavrentieva et al. (2019), K. Slovak (2023), V. Kukharenko (2023), N. Rashevska and N. Kiianovska (2023), and A. Striuk (2023), explored the use of cloud computing, mobile technologies, and online platforms to enhance the accessibility, flexibility, and quality of technical and tertiary education programs.

Furthermore, studies by V. Tkachuk et al. (2022), O. Fedorenko et al. (2022) and A. Kostikov et al. (2022) investigated the adaptation of mobile technologies, learning management systems, and adaptive testing algorithms to support distance learning and ensure continuity of quality education during crises like the COVID-19 pandemic.

The article by S. Semerikov and P. Nechypurenko (2020) investigates strategies for adapting science education during crises like the COVID-19 pandemic. By exploring innovative teaching methods, online platforms, and tools, the study provides insights into maintaining the continuity and quality of education even in challenging circumstances, essential for ensuring equal access to tertiary education.

S. Amelina (2020) contributes to enhancing language education by designing tasks based on historical materials related to German immigrants in Kyiv. These tasks, adhering to principles like communicative orientation and intercultural sensitisation, promote effective language learning and cultural awareness, which are essential components of quality tertiary education.

N. Vyrsta (2020) explores using authentic press texts in language education, emphasising the development of intercultural competence, critical thinking, and language skills. By engaging students in meaningful learning experiences, this approach supports the goal of providing quality and inclusive tertiary education.

Y. Kazhan (2020) focuses on fostering socio-cultural competence among students by integrating historical and cultural contexts into educational materials. Mobile applications and web tools enhance language learning experiences and promote intercultural understanding, contributing to the quality of tertiary education.

V. Karpiuk (2020) addresses the development of local lore competence in language education, emphasising the connection between linguistic and cultural knowledge. This study promotes effective learning methods that support quality tertiary education by incorporating modern information technologies and internet resources.

I. Piankovska (2020) analyses the selection of reading comprehension exercises in foreign language lessons, highlighting the importance of receptive and productive language skills. This emphasis on effective language learning experiences aligns to provide quality tertiary education.

S. Amelina and L. Berezova (2020) explore the cross-cultural adaptation of educational programs by comparing curricula for translator training in Ukraine and France. This comparative analysis contributes to enhancing the quality and inclusivity of higher education by considering the integration of international practices.

While these studies contribute valuable insights, several areas require further exploration to address SDG 4.3 comprehensively:

- examining socioeconomic, cultural, and geographical barriers to accessing technical/vocational/tertiary education and developing targeted interventions to promote inclusivity;
- assessing the long-term impact of online and blended learning modalities on student achievement, skill development, and employment outcomes;
- exploring strategies for aligning technical and vocational education curricula with evolving industry demands and emerging technologies;
- investigating sustainable funding models and partnerships to ensure affordability and financial accessibility of higher education programs;
- evaluating the effectiveness of international collaborations, exchange programs, and cross-border education initiatives in promoting global access and mobility.

By addressing these gaps through interdisciplinary and cross-cultural research, the global community can develop comprehensive strategies to ensure equal access to quality technical, vocational, and tertiary education, empowering individuals and contributing to sustainable development.

SDG4.4 – Relevant skills for employment.

Equipping individuals with relevant technical, vocational, and transferable skills is crucial for enhancing employability, fostering entrepreneurship, and promoting sustainable economic growth. The reviewed articles shed light on various strategies and initiatives to align educational offerings with the evolving demands of the job market and industry needs.

Several studies, such as those by L. Bilousova and L. Gryzun (2022), V. Morkun et al. (2021), and O. Pershukova et al. (2023), explore innovative approaches to curriculum design, industry collaborations, and interactive learning methodologies. These efforts ensure that students across diverse fields, from information technology and engineering to aviation and language studies, acquire the relevant technical knowledge and practical skills necessary for success in their chosen professions.

Furthermore, studies by O. Pinchuk and A. Prokopenko (2021), O. Riezina et al. (2022), and I. Lovianova et al. (2019), highlight the importance of fostering digital competencies, problem-solving abilities, and computational thinking among students. By integrating emerging technologies, coding exercises, and real-world optimisation challenges into educational programs, these initiatives aim to prepare learners for the demands of the digital age and equip them with the skills required to thrive in various industries and entrepreneurial endeavours.

Several other articles, such as those by P. Zahorodko (2023), A. Yurzhenko et al. (2023), M. Mintii (2023), and I. Mintii (2023), emphasise the importance of adopting innovative pedagogical approaches, including Agile frameworks, STEM education, blended learning, and the integration of cutting-edge technologies like augmented reality. These studies underscore the need for educational institutions to adapt and evolve continuously, ensuring that their programs remain relevant and aligned with the rapidly changing technological landscape and industry requirements.

The reviewed articles also delve into various aspects of skill development, including research capabilities (P. Nechypurenko et al., 2022), data management and knowledge dissemination (Y. Shapovalov et al., 2022; K. Ehimwenma et al., 2022) strategic decision-making (O. Ignatenko, 2022), and professional competencies for specific fields like psychology (D. Koval, 2021) and competitive specialists (N. Volkova, 2022).

Additionally, studies explore educational design (V. Dokuchaieva, 2022), immersive resources (S. Semerikov et al., 2022), data structures teaching (Z. Seidametova, 2022), digital competence for economists (T. Berezhna et al., 2022), gamification for stress resistance (H. Varina et al., 2022), mobile competence for software engineers (A. Striuk, 2022), web technologies integration (S. Proskura et al., 2021), adaptive maritime education (S. Voloshynov et al., 2021), personalised training systems (K. Osadcha et al., 2021), computer vision systems (S. Semerikov et al., 2021), adaptive learning on Moodle (L. Fadieieva, 2021), quantum informatics teaching (L. Lehka and S. Shokaliuk, 2021), translator education trends (S. Amelina and I. Kononchuk, 2021), AR for math teaching (T. Kramarenko et al., 2019), Google Lens in education (V. Shapovalov et al., 2019), Arduino integration (V. Zadorozhnyi, 2020), theater projects for teacher training (M. Kov´aˇcov´a 2020), information consulting environments

(O. Lavrentieva et al., 2020), digital competence development (M. Moiseienko et al., 2020), computer literacy for multicultural education (I. Ivaniuk, 2020), and bilingual specialist training through art (M. Baditsa et al., 2020).

While these studies contribute valuable insights, several areas require further exploration to address SDG 4.4 comprehensively:

- conducting longitudinal studies to assess the long-term impact of educational interventions and skill development programs on employment outcomes, career trajectories, and entrepreneurial success;
- exploring strategies for fostering transferable skills, such as critical thinking, problem-solving, communication, and adaptability, are essential for navigating the rapidly evolving job market;
- investigating the role of work-based learning opportunities, internships, and industry partnerships in bridging the gap between educational offerings and real-world skill requirements;
- examining the challenges and opportunities associated with reskilling and upskilling initiatives, particularly for adults and displaced workers, to support career transitions and lifelong learning;
- assessing the effectiveness of entrepreneurship education programs in nurturing entrepreneurial mindsets, providing practical business skills, and supporting the creation of sustainable enterprises;
- exploring the potential of emerging technologies, such as virtual and augmented reality, to enhance skill development and provide immersive learning experiences that simulate real-world scenarios.

By addressing these research gaps through interdisciplinary collaborations, evidence-based assessments, and continuous dialogue with industry stakeholders, the global community can develop robust strategies to ensure that educational systems effectively equip individuals with the relevant skills needed for employment, decent jobs, and entrepreneurship. Such efforts are crucial for fostering sustainable economic growth, promoting social mobility, and empowering individuals to thrive in an ever-changing and increasingly digital world.

SDG4.5 – Equal access to education.

N. Horishna et al. (2020) identified trends and challenges in implementing inclusive education in Ukraine through desk research. Key barriers were a lack of resources, training and coordination at the government levels. While this study provides insights into the state of inclusive education in Ukraine, more comprehensive research is needed to address SDG 4.5 adequately.

Potential areas for future research could include:

- examining socioeconomic, cultural, and geographical barriers to accessing education faced by vulnerable groups such as girls, persons with disabilities, minorities, displaced populations, etc.;
- evaluating program interventions aimed at increasing access, participation, and retention for these vulnerable groups across all levels of education;
- analysing policies, funding initiatives, and support systems to promote inclusion, equity, and non-discrimination in education systems;
- assessing teacher training programs focused on supporting diverse learners, nurturing tolerance, and creating inclusive learning environments;
- investigating the impact of vulnerabilities like poverty, cultural norms, and physical distances on access to quality education;
- exploring the potential of technologies like online learning, assistive tools, and mobile platforms to deliver education to marginalised groups;
- conducting comparative studies to identify best practices and scalable models for achieving equitable access to education across contexts.

By addressing these critical research gaps through rigorous studies, the global community can better understand the barriers, challenges, and potential solutions for ensuring equal access to education for all, regardless of gender, disability, or other vulnerabilities. Such insights are crucial for informing policies, programs, and interventions to eliminate disparities and create inclusive, equitable, and sustainable

education systems.

SDG4.6 – Universal literacy and numeracy.

Skovoroda's «school without walls» that taught skills for a happy life (E. Panasenko et al., 2020) addressed literacy and skills development through a historical analysis of the education system. While this provides a retrospective view, more contemporary research is needed to support the achievement of universal literacy and numeracy.

O. Piatykop et al. (2022) developed an augmented reality mobile app to teach young children the Ukrainian alphabet, numbers, and animal sounds. Testing showed that the technology boosted engagement and learning of early literacy and numeracy skills. This demonstrates the potential of educational apps to promote childhood literacy and numeracy.

O. Kanevska (2021) discussed using linguistic analysis of texts to improve literacy skills in Russian language lessons. The techniques help students develop conscious language use, aesthetic senses, and communication abilities. This exemplifies methodology to enhance literacy education and outcomes.

O. Bilozir (2021) discusses the importance of reforming education in Ukraine, considering the peculiarities of the modern educational environment. The article explores pedagogical conditions for multilingual education, the development of educational programs for teaching foreign languages, promoting active language learning, and using information technologies. These insights can inform efforts to enhance literacy outcomes in a multilingual context.

V. Hamaniuk (2021) explores the potential of Large Language Models (LLMs) in language education, including machine translation, creative writing tools, and paraphrasing tasks. By leveraging LLMs responsibly, educators can enhance literacy instruction and support language skill development.

While these studies contribute valuable perspectives, more comprehensive research efforts are required to address SDG 4.6 adequately. Potential areas for future investigation include:

- evaluating the effectiveness of various pedagogical approaches, curricula, and assessments in improving literacy and numeracy outcomes across age groups and contexts.
- exploring the role of family, community, and socioeconomic factors in shaping literacy and numeracy development and identifying targeted interventions to address disparities.
- assessing the impact of educational technologies, digital resources, and online platforms in promoting universal literacy and numeracy, particularly in remote or underserved areas.
- investigating the integration of literacy and numeracy skills within vocational and technical education programs to enhance employability and workforce readiness.
- examining the challenges and strategies for achieving universal adult literacy and numeracy, including through non-formal and continuing education initiatives.
- conducting longitudinal studies to track the long-term impact of literacy and numeracy interventions on individuals' educational attainment, socioeconomic mobility, and overall well-being.
- exploring the role of cross-sector collaborations, public-private partnerships, and community-based initiatives in promoting universal literacy and numeracy at a larger scale.

By addressing these research gaps through rigorous studies across diverse contexts, the global community can better understand the barriers, challenges, and effective strategies for achieving universal literacy and numeracy. Such insights are crucial for informing policies, programs, and interventions to ensure that all individuals, regardless of age, gender, or background, have access to quality education and the foundational skills necessary for lifelong learning, personal growth, and sustainable development.

SDG4.7 – Education for sustainable development and global citizenship.

The study by I. Kholoshyn et al. (2019) explores the integration of Earth remote sensing data into modern school curricula, particularly in subjects such as geography, biology, history, physics, and computer science. The authors argue that using aerospace images and remote sensing data in the learning process can increase the information context value of learning and contribute to the formation of students' cognitive interests. The article promotes acquiring knowledge and skills related to sustainable development through using Earth observation data. Remote sensing data can provide valuable insights into various processes and phenomena in the Earth's geographic shell, including the atmosphere, hydrosphere, and lithosphere. By incorporating these data into school curricula, educators can equip learners with a better understanding of environmental dynamics, spatial and temporal patterns, and the

impact of human activities on the planet. This knowledge and skill set can ultimately contribute to promoting sustainable development practices and decision-making.

The study by T. Svatenkova and O. Svatenkov (2023) examines the influence of intersubjective interactions in children's health and recreation facility developmental environments on the manifestation of psychological potential among teenagers. The authors developed and tested a model for actualising teenagers' psychological potential in these temporary developmental environments. By focusing on the psychological potential of teenagers, the study contributes to their overall development, which is crucial for fostering global citizenship, appreciating cultural diversity, and promoting sustainable lifestyles. The model proposed in the article aims to enhance emotional intelligence, improve social status within peer groups, and activate various components of psychological potential, such as motivational, behavioural, emotional, and value-based aspects. These elements are essential for equipping learners with the necessary skills and mindsets to navigate complex social and environmental challenges, ultimately contributing to the broader goals of sustainable development.

The article by T. Mishenina (2023) provides a historical and pedagogical overview of foreign language education in Ukraine. It highlights the importance of foreign language education in promoting cultural understanding, intercultural dialogue, and global citizenship, which are essential components of education for sustainable development. The article traces the development of foreign language education in Ukraine from ancient times to the present day, highlighting the various socio-political and economic factors that have influenced the country's teaching and learning of foreign languages. It emphasises the role of foreign language education in preserving cultural identity while promoting intercultural understanding and global cooperation, which are crucial for achieving sustainable development goals. The article also discusses the impact of Ukraine's independence in 1991 and the subsequent alignment of foreign language education with European recommendations and strategies, reflecting the country's commitment to promoting sustainable development through education.

The article by V. Demianenko (2023) focuses on developing a unified, personalised, open computer-integrated learning environment for the Junior Academy of Sciences of Ukraine (JASU). The JASU is crucial in fostering innovative thinking, research competence, and a culture of scientific inquiry among students. The proposed learning environment aims to promote the development of students' research competence by integrating cloud-based information and communication technologies (ICT) and personalised virtual platforms. By leveraging these technologies, the learning environment can provide students access to educational resources, facilitate collaboration, and support personalised learning experiences. The article discusses the importance of creating an acmeological educational space that considers the innovative development of education, personal demands, and societal and state needs. This aligns with the goal of promoting quality education and equipping learners with the knowledge and skills required to address complex challenges and contribute to sustainable development.

The article by L. Lehka et al. (2023) focuses on exploring the quantum frontier in school informatics education, specifically by introducing lyceum (high school) students to the fundamental principles of quantum informatics. By introducing students to cutting-edge concepts in quantum informatics, this research aims to equip learners with the knowledge and skills required to understand and contribute to developing emerging technologies. This approach aligns with the goal of promoting education for sustainable development by fostering a deep understanding of advanced scientific concepts and their potential applications in addressing global challenges. V. Ustymenko and V. Hamaniuk (2023) examine the theoretical and organisational foundations of language education in the Canadian education system, focusing on the context of globalisation processes and a multilingual society. The study provides a retrospective analysis of the formation and development of language teaching in the Canadian education system, highlighting the socio-political context and the stages of the evolution of a multilingual society. This historical perspective sheds light on the importance of language education in fostering cultural understanding and promoting diversity within a multicultural nation like Canada. The study contributes to the broader goal of promoting global citizenship and intercultural dialogue through education by exploring the challenges and strategies associated with language education in a multicultural context.

V. Karpiuk et al. (2023) focus on exploring the history of Germans, including German and Austrian prisoners of war, in the region of Southern Ukraine. By researching and uncovering new facts about this

historical presence, the authors aim to contribute to developing historical research and promote an appreciation of cultural diversity. The article discusses how the newly discovered materials can be used as teaching materials, integrating scientific research with education. The authors describe a teaching and research project that identified locations where German prisoners of war were housed and worked and buildings constructed by them in the Dnipropetrovsk region. By exploring these «German traces» in various spheres of life in the region, the project contributes to a deeper understanding and appreciation of cultural diversity and its historical significance, which aligns with the goals of promoting global citizenship and intercultural dialogue through education.

O. Kolgatin et al. (2022) propose a shift in Ukrainian statistical education, including PhD studies, away from traditional null hypothesis significance testing and towards statistical modelling as a modern and practical approach to establishing scientific hypotheses. They argue that learning investigations, based on the fact that modern personal computers can run simulations in a reasonable amount of time with great precision, is a technique for comprehending inductive statistics. Scientific papers and the American Statistical Association's recommendation support the authors' findings. By advocating for a more contemporary and practical approach to statistical education, the study equips learners with the skills and knowledge necessary for conducting rigorous and relevant research, essential for addressing complex global challenges and promoting sustainable development.

V. Burak and D. Holovko (2021) analyse the traditional methodology for implementing laboratory work «Measurement of acceleration in uniformly accelerated movement» in 10th-grade classes and identify its disadvantages. They propose an author's methodology for executing this laboratory work, eliminating the detected shortcomings on the «standard» levels and «in-depth». In addition to the main experiment, an additional experiment is proposed, as well as an additional experimental task that allows students to prove that it is really equipped with movement and recycle relevant moving graphics and speeds from time to time. By enhancing the methodology for conducting this laboratory work, the study contributes to improving the quality of science education. It is essential for fostering a deep understanding of scientific principles and their applications in addressing global challenges related to sustainable development.

I. Zenkovych (2021) discusses the content and essence of students' artistic and creative activity in fine arts classes and the process of creating new, original artistic images. The study reveals that such activities also involve the perception and experience of artistic phenomena through their aesthetic evaluation. The author identifies the stages of mastering the holistic picture of the world, gaining individual experience of artistic creativity, and using and expanding students' artistic experience. The article emphasises the importance of the artist-teacher's leadership in pupils' artistic and creative activities through pedagogical planning, organisational support, adjustment, analysis, and evaluation of results. By promoting artistic and creative expression, the study aims to foster holistic personal development, which is essential for cultivating global citizens who can appreciate and contribute to cultural diversity, creativity, and sustainable development.

S. Semerikov (2021) introduces the Educational Technology Quarterly (ETQ), a new Diamond Open Access peer-reviewed journal by the Academy of Cognitive and Natural Sciences. The journal focuses on how digital technology can enhance education and welcomes research papers on the pedagogical uses of digital technology where the focus is broad enough to interest a wider education community. In addition to empirical work, ETQ welcomes systematic reviews and meta-analyses that include clear research questions, a framework of analysis, and conclusions that reflect the paper's aims. By promoting research on integrating digital technologies in education, the journal can contribute to exploring innovative approaches that enhance the quality and accessibility of education, aligning with the goals of sustainable development.

T. Vasyliuk (2021) discusses implementing a competence approach in education, focusing on social competence as a complex of personality competencies. It emphasises the importance of humanitarian disciplines in developing students' social competencies, crucial for integration and globalisation in the modern world economy. The model presented in the article consists of four interconnected blocks: motivational-target, organisational-activity, technological, and result-reflective, each contributing to the effective formation of social competence. This article provides learners with the competencies necessary

to promote a sustainable and globally integrated society. The focus on social competencies aligns with the objective of fostering education that enables learners to become responsible global citizens and contribute to sustainable development. The article by T. Mishenina and I. Selyshcheva (2021) addresses the integration of linguistics and history in developing an educational course, focusing on the relationship and interaction between culture and language. It outlines the structure of the course «Linguoculturology», which includes topics such as the ontology of linguoculturology, the value communicative nature of linguocultural studies, and the linguistic picture of the world. The course content is designed to develop competencies that expand the understanding of linguoculturology, emphasising the importance of cultural and linguistic awareness in the context of global citizenship and sustainable development.

The article by K. Vlasenko et al. (2020) delves into the process of organising public debates around the educational curriculum draft for Master students specialising in Secondary Education (Mathematics) within the academic discipline of Education/Pedagogics. The article contributes to discussions on curriculum design and development. It underscores the importance of policy dialogue surrounding curriculum decisions. By involving stakeholders and considering their perspectives, educators can create more effective and relevant curricula aligning with sustainable development and global citizenship goals.

The article by A. Tymoshko et al. (2020) investigates the processes related to information support for education quality management within general secondary educational institutions in Ukraine. The article contributes to discussions on quality assurance in educational settings. By ensuring accurate and timely information, educational institutions can make informed decisions and improve overall quality, essential for providing high-quality education that fosters sustainable development and global citizenship.

The article by O. Chernyshova and T. Tokmylenko (2020) explores innovative approaches to addressing educational challenges through non-formal education. The article reviews and distinguishes between three education models: formal education (traditional classroom-based learning), non-formal education (a flexible approach that complements formal education), and informal education (self-directed learning). The focus is leveraging these models to address educational challenges effectively. By exploring alternative educational models and their potential to complement formal education, the study contributes to the broader goal of promoting lifelong learning opportunities and fostering diverse pathways for personal and professional development, essential for sustainable development and global citizenship.

The article by M. Sherman and A. Yurzhenko (2020) investigates the formation of English-language communicative competence among future ship engineers using a gamification approach. By exploring innovative pedagogical techniques, such as gamification, to enhance language learning and communication skills, the study aims to promote global citizenship through effective language education and intercultural understanding.

The article by V. Hamaniuk (2020) delves into the development of intercultural competence, an essential aspect of foreign language education. Learners gain insights into cultural differences, historical events, and their surroundings by exploring historical facts related to the Germans and Germany in a European context. Removing prejudices about the «alien» fosters a positive disposition toward intercultural communication. Incorporating such themes into educational processes contributes to achieving quality education goals by promoting understanding, tolerance, and cross-cultural awareness, essential components of global citizenship and sustainable development.

The article by K. Stupak (2020) examines Finnish schools through the lens of I. Kant’s and M. Lipman’s reflective models of educational practice highlight the importance of critical thinking and reflection in the learning process. By advocating for an education system that encourages students to analyse information and critically engage in reflective thinking, the article supports the development of competencies essential for understanding and addressing global challenges related to sustainable development and global citizenship.

The axiological approach discussed in the article by O. Kryvylova et al. (2020) is instrumental in shaping future educators’ values and ethical orientations. By integrating these values into the psychological and pedagogical training of teachers, the study supports the development of educators who can foster a culture of peace, non-violence, and global citizenship among learners, which is essential for achieving the goals of sustainable development and promoting a more equitable and inclusive society.

Overall, the articles reviewed in this subsection contribute to various aspects of SDG 4.7, including promoting cultural understanding, fostering global citizenship, integrating sustainable development concepts into curricula, and developing competencies essential for addressing complex global challenges. However, there is still a need for more comprehensive and interdisciplinary research that directly examines pedagogical approaches, curricula, and assessment frameworks explicitly tailored to education for sustainable development and global citizenship. Additionally, more studies exploring the integration of these concepts across diverse educational levels and contexts, particularly in developing countries, could provide valuable insights for achieving this crucial SDG target.

SDG4.a – Education facilities.

L. Bilousova and L. Gryzun (2022) designed simulations to develop IT curricula adapted to available education facilities. By leveraging simulations, educational institutions can overcome limitations in physical infrastructure and provide students with realistic, interactive learning experiences that align with industry demands and available resources.

V. Velychko et al. (2022) proposed virtual laboratories via cloud computing to improve physics teacher training with limited facilities. The study analysed different cloud-based tools for creating virtual labs and training resources. Cloud-based virtual laboratories offer a cost-effective and scalable solution to address infrastructure constraints, enabling institutions to provide high-quality science education and teacher training experiences without the need for extensive physical laboratory setups.

The study by M. Popel and M. Shyshkina (2019) examines the current state of educational research on cloud-based learning systems and environments. The authors investigate the relationship between cloud-based learning systems and environments, highlighting different interpretations and approaches to these concepts in the literature. Cloud-based learning systems and environments have the potential to provide accessible, flexible, and scalable educational resources and tools, which can support the creation of safe, non-violent, and inclusive learning spaces for all students, regardless of their backgrounds or abilities. By exploring cloud-based systems' theoretical foundations and practical implementations, this study contributes to the broader goal of upgrading and enhancing educational facilities and environments to promote quality education for all.

The article by V. Bykov (2023) focuses on modernising the education system in Ukraine by integrating cloud computing technology. The article highlights the importance of comprehensive informatisation of the national education system to facilitate the implementation of a modern educational paradigm based on the principles of open education. It emphasises the role of ICT in enhancing teaching effectiveness and improving the content and technology of educational resources. Integrating cloud computing technology and ICT outsourcing in educational organisations is a strategic area for education informatisation in Ukraine. By leveraging these technologies, the education system can be revitalised and better equipped to provide effective and inclusive learning opportunities for all students, regardless of their circumstances or backgrounds. This aligns with the goal of upgrading educational facilities and adopting innovative technologies to support quality education.

O. Burov and O. Pinchuk (2021) explore the use of augmented reality (AR), virtual reality (VR), mixed reality (MR), and extended reality (XR) technologies in education, examining their impact, opportunities, and how to mitigate associated risks. It presents a methodology for studying psychophysiological changes in students under normal and stressed conditions, which is crucial for creating effective and safe learning environments that utilise these immersive technologies. The research findings, particularly the decrease in myocardial tension index during immersive activities, can inform the development of educational facilities and programs that leverage AR/VR/MR/XR technologies to enhance learning experiences while ensuring student well-being, aligning with the goals of providing quality education and promoting lifelong learning opportunities for all.

The article by O. Herasymenko (2021) examines the evolution and current state of adult education in Ukraine, particularly in the context of the 21st century's rapid economic, technological, and cultural changes. It highlights the necessity for adults to engage in lifelong learning to adapt to globalisation and the new pace of life. The article analyses adult education from the postwar period to the post-USSR era and during Ukraine's independence years. It identifies challenges hindering the quality development of adult education in Ukraine, such as inadequate legal support, demographic issues, high unemployment,

poverty, limited research on adult education, and uncertainties in training andragogy specialists. The author also proposes potential improvements for the adult education system in Ukraine. By addressing the challenges and opportunities in adult education, the study contributes to upgrading educational facilities and resources to support lifelong learning opportunities for all individuals, regardless of age or background.

The article by S. Voloshynov et al. (2021) presents an adaptive learning environment that supports individual learning paths and promotes a cooperative and supportive educational atmosphere, which is essential for creating inclusive and effective learning environments. The proposed adaptive learning environment leverages advanced technologies, such as artificial intelligence and machine learning, to personalise the learning experience for each student. This environment can enhance student engagement, motivation, and academic achievement by adapting to individual needs, learning styles, and progress. Moreover, the cooperative and supportive aspects of the environment foster a positive and inclusive learning culture, aligning with the goals of providing equitable and quality education for all.

K. Osadcha et al. (2021) emphasise the importance of creating an educational environment that adapts to the needs of students, including the use of electronic resources and personalised learning experiences. This aligns with the goal of enhancing learning environments to support quality education. The authors propose developing an adaptive learning system to provide personalised educational resources and learning paths based on individual student profiles, learning styles, and progress monitoring. By leveraging advanced technologies and data analytics, such adaptive systems can improve student engagement, retention, and overall academic performance, creating effective and inclusive learning environments.

S. Semerikov et al. (2021) provide an overview of the use of computer vision systems in education, highlighting their potential to improve educational outcomes and environments. The article discusses various applications of computer vision systems, such as attendance monitoring, behaviour analysis, and security surveillance. Computer vision systems, as described in the article, can enhance the safety and effectiveness of learning environments by monitoring attendance, detecting infiltration, and preventing vandalism. By leveraging advanced technologies like computer vision, educational institutions can create more secure and conducive learning spaces, supporting the overall goal of providing safe and inclusive education facilities.

While the reviewed articles provide valuable insights into leveraging technologies to enhance educational facilities and environments, several areas require further research to address SDG comprehensively:

- assessing the long-term impact and cost-effectiveness of implementing advanced technologies, such as cloud computing, virtual reality, and computer vision systems, in educational settings, particularly in resource-constrained environments;
- exploring sustainable funding models and public-private partnerships to support the upgrading and maintenance of educational facilities, including adopting innovative technologies;
- investigating the challenges and opportunities associated with integrating advanced technologies into existing educational infrastructure, particularly in developing countries or remote areas with limited access to reliable internet and technological resources;
- evaluating the effectiveness of teacher training programs in equipping educators with the necessary skills and competencies to leverage advanced technologies in their teaching practices;
- conducting comparative studies to identify best practices and scalable models for creating inclusive, safe, and conducive learning environments that cater to diverse learner needs and promote equity in education;
- exploring the potential of community-based initiatives and participatory approaches in designing, developing, and maintaining educational facilities to foster a sense of ownership and sustainability.

By addressing these research gaps through interdisciplinary collaborations and cross-contextual studies, the global community can develop comprehensive strategies to upgrade and enhance educational facilities, leveraging advanced technologies while ensuring accessibility, inclusivity, and sustainability.

Such efforts are crucial for creating conducive learning environments that support quality education and lifelong learning opportunities for all, ultimately contributing to the achievement of SDG 4.

SDG4.b – Scholarships.

The review did not identify any articles directly addressing SDG4 target 4.b on expanding scholarships and facilitating international mobility in education and training, particularly for developing countries. The papers focused on other topics, such as educational technology, teaching methods, curriculum design, and professional development.

To adequately support SDG4.b, future research could explore the following areas:

- evaluating the impact and effectiveness of existing scholarship programs in facilitating global student exchanges, explicitly focusing on opportunities for students from developing countries;
- analysing policies, funding mechanisms, and cross-border partnerships aimed at expanding international education and training opportunities, particularly for underrepresented and marginalised populations;
- exploring the potential of virtual exchange programs, online collaborative learning platforms, and digital technologies to enable global classroom connections and enhance international mobility in education;
- examining the barriers to international student mobility, such as financial constraints, visa restrictions, language barriers, and cultural differences, and investigating strategies to broaden accessibility and inclusivity;
- conducting comparative studies to identify best practices and scalable models for promoting two-way mobility between developed and developing country institutions, fostering mutual learning and cross-cultural exchange;
- assessing the impact of international scholarship and exchange initiatives on personal and professional growth, intercultural competence development, and long-term employability and career prospects;
- investigating the role of international, non-governmental organisations, and public-private partnerships in facilitating global education and training opportunities, focusing on developing countries.

With investigational insights in these areas, evaluating progress on SDG4.b or developing informed strategies for expanding scholarships and promoting international mobility in education and training is easier. The need for more relevant papers in the reviewed journal represents a critical gap in the literature that future research could help address.

By conducting rigorous studies on these topics, researchers can provide policymakers, educational institutions, and international organisations with valuable evidence-based recommendations for designing and implementing effective scholarship programs, facilitating cross-border collaborations, and fostering an inclusive global learning environment that empowers individuals from diverse backgrounds, including those from developing countries.

SDG4.c – Teachers.

S. Lytvynova and N. Demeshkant (2021) evaluated distance learning for primary school teachers during the pandemic through surveys and analysis of online tools used. Key challenges identified were technology access and training. This study highlights the need to equip teachers with the necessary digital skills and resources to effectively deliver distance education, which has become increasingly important in the face of global crises and changing educational landscapes.

I. Mintii (2023) reviewed blended learning for teacher training based on 27 sources from 2011 to 2019. The benefits and challenges of blended learning for teacher development were highlighted. By synthesising existing research on blended learning approaches, this study provides insights into practical strategies for integrating technology and traditional classroom instruction to enhance teacher training programs, ultimately contributing to developing a skilled and adaptable teaching workforce.

S. Semerikov and I. Mintii (2020) mapped research on lifelong learning quality using bibliometric analysis of 218 sources from 1969 to 2020. Cluster analysis identified key themes like continuing education and quality assurance. This comprehensive analysis underscores the importance of lifelong learning opportunities for teachers, enabling them to update their knowledge, skills continuously, and pedagogical practices, thereby improving the quality of education they provide. The study by S.

Semerikov et al. (2023) proposes a comprehensive framework for assessing the effectiveness of scientific activity among research and academic staff in educational institutions. The authors identify and describe criteria and indicators covering various aspects of research activity, including publication outputs, scientometric measures, altmetric considerations, expert contributions, and representative scholarly achievements. Educational institutions can identify and recognise qualified and effective researchers and academics by establishing clear criteria and indicators for evaluating research productivity, impact, and contributions. This, in turn, can inform decisions related to faculty recruitment, promotion, and professional development, ultimately leading to an increased supply of qualified teachers and researchers. Furthermore, as highlighted in the criteria, the emphasis on international engagement and collaboration aligns with the target's focus on international cooperation for teacher training, which is particularly relevant for developing countries.

The article by M. Mintii (2023) recognises the pivotal role of qualified educators in delivering effective STEM education, which is essential for promoting quality education and fostering technological advancements. The study contributes to disseminating knowledge and experiences related to STEM teacher training on a global scale by conducting a comprehensive review of literature from various sources and databases. This can facilitate international cooperation and the exchange of best practices, potentially benefiting developing countries in their efforts to increase the supply of qualified STEM teachers. Additionally, the article's recommendations for integrating programming, computational thinking, and innovative technologies such as virtual reality and educational robotics into teacher training programs can inform and enhance teacher education initiatives worldwide, including in developing countries. By addressing the professional development needs of STEM teachers and promoting international collaboration, the research supports the broader goal of increasing the supply of qualified educators globally.

The article by M. Mintii (2023) focuses on identifying the pedagogical conditions necessary to effectively train STEM teachers to use augmented reality technologies in their classrooms. The authors surveyed to determine the essential conditions, which include: a) accessibility of immersive digital educational resources and mobile hardware for augmented reality; b) inclusion of augmented reality-related topics in STEM teachers' curricula; c) use of research methodologies and interactive technologies in STEM classrooms; d) hands-on experience with augmented reality technologies in STEM instruction. This article provides insights and recommendations on training and equipping STEM teachers with the necessary skills and resources to incorporate emerging technologies, such as augmented reality, into their teaching practices. By identifying the key pedagogical conditions for effective teacher training in this area, the article supports increasing the supply of qualified STEM teachers who can leverage innovative technologies to enhance student learning and engagement.

The article by I. Mintii (2023) examines blended learning (BL) for teacher training and retraining during and after the COVID-19 pandemic. Blended learning combines face-to-face, synchronous, and asynchronous distance learning methods and various information and communication technology tools and pedagogical technologies. This article highlights the potential of blended learning to increase access to teacher training and professional development opportunities. By leveraging both traditional classroom instruction and online learning components, blended learning can provide a flexible and personalised approach to teacher education, which is particularly important in the context of developing countries where access to quality teacher training programs may be limited. The article identifies the benefits of blended learning for teacher training, such as enhanced access to resources, improved communication and collaboration, and opportunities for reflection and creativity. However, it also acknowledges the challenges associated with implementing blended learning, such as the need for reliable technology, technical support, and adequate training for teachers and students. The article by V. Kukharenko et al. (2023) focuses on the theoretical foundations of training experts and leaders in distance learning, intending to improve their training programs. It highlights the importance of developing competencies and skills for designing and implementing effective distance learning courses and systems. By training experts and leaders in distance learning, the article contributes to increasing the supply of qualified educators who can leverage technology and innovative pedagogical approaches to enhance the quality of education. The article describes the essential skills that distance learning experts and leaders should

possess, such as experience in developing distance courses, conducting online classes, and curating content. It also discusses the typical mistakes made by distance course developers, which can inform the design of more effective training programs. By refining the training program based on the results of the pilot and considering the challenges posed by the pandemic and military actions, the authors aim to improve the quality of distance learning expert and leader training. This iterative approach to program development can enhance the supply of qualified educators who can effectively design and implement distance learning initiatives.

A. Kharkivska et al. (2021) discuss the current state of higher education, characterised by significant reforms, and the need for highly qualified specialists with professional competencies and a well-established system of moral attitudes and beliefs. They emphasise the need to build a model of the education system to achieve goals and solve problems effectively. The article reviews the models of the training system proposed by domestic scientists. It determines that the main components of the model are purpose, stages, pedagogical conditions, functions, forms, methods of work, and results. The authors' findings are supported by a review of physical, mathematical, computer, descriptive models, and pedagogical modelling as a method of pedagogical research. This study highlights the importance of developing comprehensive and holistic models for teacher training programs, considering factors such as purpose, pedagogical approaches, and desired outcomes. By examining existing models and identifying their key components, the research contributes to developing effective teacher education frameworks that can produce highly qualified and competent educators.

O. Ovcharuk and I. Ivaniuk (2021) present the results of an all-Ukrainian online survey conducted to assess teachers' digital competence in Ukraine. It emphasises the importance of digital competencies in the context of globalisation, the digital economy, and the knowledge society. The survey, which involved 1463 educators, focused on their abilities in various areas such as information and digital literacy, communication and cooperation, digital content creation, security, and problem-solving. The findings are intended to inform proposals for developing teachers' digital competence and professional development. By assessing the current state of digital competencies among Ukrainian teachers, this study provides valuable insights for designing targeted training programs and initiatives to equip educators with the necessary digital skills to effectively integrate technology into their teaching practices and adapt to the evolving demands of the digital age.

The article by T. Ternavska (2021) examines the concept of professional burnout among socio-pedagogical workers. It defines burnout as a state of emotional, physical, and mental exhaustion due to prolonged stress. It identifies contributing factors such as lack of control, unclear job expectations, insufficient social support, work-life imbalance, and psycho-emotional instability. The study also lists typical signs of burnout, including insomnia, negative attitudes, substance abuse, eating disorders, anxiety, irritability, tension, anger, resentment, depression, guilt, and a loss of motivation and responsibility. Understanding and addressing professional burnout is crucial for maintaining a healthy and effective workforce of educators and socio-pedagogical professionals, and it is essential for achieving quality education and lifelong learning opportunities for all. By identifying the causes and symptoms of burnout, this research can inform the development of support systems, work-life balance initiatives, and counselling services for teachers, ultimately contributing to their overall well-being and ability to deliver quality education.

The article by V. Oleksiuk et al. (2021) examines the criteria used internationally to assess the effectiveness of scientific and educational research. It discusses the challenges of analysing source bases, ensuring research reproducibility, and using scientometric and altmetric indicators. The authors emphasise the importance of peer-reviewed publications indexed in scientometric databases as primary sources for reliable research evaluation. They also highlight the role of digital identifiers like DOI, open data, and digital institutional repositories in enhancing research performance indicators. Despite the emergence of new scientometric indicators, the citation index, particularly the H-index, remains widely used. The article also addresses the influence of social networks on altmetric indicators and the scepticism among scientists about the correlation between traditional and altmetric impact measures due to the potential for artificial influence on some indicators. By exploring the various criteria and indicators used to evaluate research effectiveness, this study provides valuable insights for developing comprehensive

and transparent evaluation frameworks for assessing the performance and impact of educators and researchers in education. Such frameworks can inform decisions related to professional development, career advancement, and recognition of outstanding contributions to educational research and practice. The article by V. Sydorenko et al. (2020) discusses the reform of the continuing teachers' training system in Ukraine, aiming to provide opportunities for professional development and lifelong learning. This emphasises the creation of a competitive educational environment and the modernisation of teaching content and methods. By presenting andragogic and psychological assessment instruments for teacher training, the article contributes to developing a skilled teaching workforce, essential for achieving quality education for all. The study highlights the importance of continuous professional development for teachers and the need to adapt training programs to incorporate modern pedagogical approaches, assessments, and technologies. By addressing these aspects, the research supports the goal of increasing the supply of qualified and up-to-date teachers who can effectively meet learners' evolving needs and contribute to improving educational quality.

While the reviewed articles provide valuable insights into various aspects of teacher training, professional development, and evaluation, several areas require further research to address SDG comprehensively:

- investigating the effectiveness of international partnerships and exchange programs in facilitating knowledge sharing, cross-cultural collaboration, and teacher capacity building, particularly in developing countries;
- exploring sustainable funding models and incentive structures to attract and retain qualified teachers, ensuring adequate compensation and professional growth opportunities;
- assessing the impact of teacher training programs on student learning outcomes, classroom practices, and overall educational quality across diverse contexts and educational levels;
- examining the role of community engagement and participatory approaches in designing and implementing teacher training programs that are culturally relevant and responsive to local needs;
- investigating the potential of leveraging technology and distance learning platforms to provide accessible and cost-effective professional development opportunities for teachers, particularly in remote or resource-constrained areas;
- conducting longitudinal studies to evaluate the long-term impact of teacher training initiatives on career trajectories, retention rates, and the overall quality of the teaching workforce;
- exploring strategies to foster a culture of lifelong learning and continuous professional growth among teachers, encouraging them to adapt to emerging pedagogical approaches, technologies, and global trends in education.

By addressing these research gaps through interdisciplinary collaborations, cross-cultural studies, and innovative approaches, the global community can develop comprehensive strategies to increase the supply of qualified teachers and support their ongoing professional development. This is crucial for achieving SDG 4 and ensuring that all learners have access to high-quality education delivered by competent, motivated, and well-supported educators, regardless of their geographic or socioeconomic context.

CONCLUSIONS

Quality education is the bedrock for achieving the Sustainable Development Goals and fostering a more equitable, prosperous, and sustainable world. This comprehensive review systematically analysed 106 articles from the *Educational Dimension* journal, meticulously categorising their relevance to SDG4 targets and identifying critical research gaps. The findings underscore the journal's valuable contributions while highlighting the pressing need for broader interdisciplinary and cross-contextual research collaborations.

The reviewed articles demonstrate a commendable focus on leveraging emerging technologies, such as augmented reality, cloud computing, and social media platforms, to enhance teaching, learning, and educational access across various levels. Several studies provide insightful perspectives on aligning

curricula with employment needs, promoting inclusive education models, and building teacher capacities. However, empirical evaluations that directly assess the impact of these interventions on learning outcomes and the development of sustainability competencies remain relatively limited.

Notably, the analysis reveals significant research gaps across multiple SDG4 targets that warrant further exploration. For instance, early childhood education, scholarships, and financial aid programs – crucial for promoting equitable access, school readiness, and lifelong learning opportunities – have received scant attention. Furthermore, there is a dearth of research examining curricula, pedagogies, and assessments explicitly tailored to education for sustainable development and global citizenship. Addressing these gaps is paramount for fostering the competencies necessary to navigate complex global challenges and promote sustainable development.

The geographical diversity of the reviewed articles is limited, with a predominant focus on Ukraine. While this regional concentration provides valuable context-specific insights, it underscores the importance of fostering international research collaborations. By bringing diverse perspectives from various socioeconomic, cultural, and geographical contexts, the global community can develop more nuanced and universally applicable strategies for achieving quality education for all.

Interdisciplinary approaches are essential for addressing the multifaceted nature of education and its intrinsic links to sustainable development. While the reviewed articles predominantly represent the fields of education and technology, there is a pressing need to incorporate lenses from disciplines such as sociology, psychology, anthropology, economics, and public policy. Such interdisciplinary collaborations can yield more comprehensive insights into the complex interplay of factors influencing educational access, quality, and outcomes.

As the world continues to grapple with unprecedented challenges, the role of education in fostering resilience, adaptability, and sustainable development becomes increasingly pivotal. While *Educational Dimension*, as a newly established journal, has made promising contributions to the discourse on SDG4, a more expansive research agenda is imperative – one that transcends disciplinary boundaries, embraces diverse contexts, and fosters global partnerships.

By addressing the critical research gaps identified in this review, the global community can inform evidence-based policies, programs, and interventions that enhance educational access and quality and equip learners with the knowledge, skills, and competencies necessary to navigate an increasingly complex world. Through such collaborative efforts, we can truly harness the transformative power of education as a catalyst for sustainable development, leaving no one behind on the path towards a more equitable, prosperous, and resilient future.

References

Academy of Cognitive and Natural Sciences (2024). https://acnsci.org/

Amelina, S. M. (2020). Types of tasks in the didactization of materials to trace the German in the history of Kiev. *Educational Dimension,* 2, 7–19. https://doi.org/10.31812/educdim.v54i2.3851

Amelina, S., & Berezova, L. (2020). Comparative analysis of the structure and content of curricula for translators in higher education institutions of Ukraine and France. *Educational Dimension,* 3, 93–102. https://doi.org/10.31812/educdim.v55i0.4382

Amelina, S., & Kononchuk, I. (2021). The latest trends in translator training in German higher education institutions. *Educational Dimension,* 4, 50–57. https://doi.org/10.31812/educdim.v56i4.4394

Baditsa, M., Kolesnyk, N., & Polkhovska, M. (2020). Bilingual model of future specialists' training by means of artistic design. *Educational Dimension*, 3, 117–140. https://doi.org/10.31812/educdim.v55i0.3945

Berezhna, T. I., Zaiets, S. V., & Shybirina, S. O. (2022). Formation of digital competencies among students of economic specialties. *Educational Dimension*, 6, 149–163. https://doi.org/10.31812/educdim.4393

Bilousova, L. I., & Gryzun, L. E. (2022). A simulation of synchronized curriculum for IT-specialist training based on Petri nets. *Educational Dimension,* 6, 55–67. https://doi.org/10.31812/educdim.4489

Bilozir, O. S. (2021). Pedagogical conditions for the development of students' polylingual competence

of the professional high school. *Educational Dimension,* 5, 224–235. https://doi.org/10.31812/educdim.4533

Bondarenko, O. V., Nechypurenko, P. P., Hamaniuk, V. A., & Semerikov, S. O. (2019). Educational Dimension: A new journal for research on education, learning and training. *Educational Dimension,* 1 (1), 1–4. https://doi.org/10.31812/ed.620

Buinytska, O. P., & Vasylenko, S. V. (2022). Modeling of an internal educational resource certification system. *Educational Dimension,* 6, 118–130. https://doi.org/10.31812/educdim.4487

Burak, V. I., & Holovko D. V. (2021) Measuring acceleration at uniformly accelerated motion in terms of differentiation of learning. *Educational Dimension,* 5, 194–207. https://doi.org/10.31812/educdim.4449

Burov, O., & Pinchuk, O. (2021). Extended reality in digital learning: Influence, opportunities and risks' mitigation. *Educational Dimension,* 5, 144–160. https://doi.org/10.31812/educdim.4723

Bykov, V. Y. (2023). Revitalizing education through the integration of cloud technologies. *Educational Dimension,* 8, 143–167. https://doi.org/10.31812/ed.598

Chernyshova, O., & Tokmylenko, T. (2020). Summer school: A non-formal way to tackle education challenges. *Educational Dimension,* 3, 267–284. https://doi.org/10.31812/educdim.v55i0.3942

Demianenko, V. B. (2023). Principles of a unified open personalized computer-integrated learning environment for the Junior Academy of Sciences of Ukraine. *Educational Dimension,* 8, 187–211. https://doi.org/10.31812/ed.599

Dokuchaieva, V. V. (2022). Design of innovative pedagogical systems as a transdisciplinary-oriented concept. *Educational Dimension,* 7, 1–20. https://doi.org/10.31812/educdim.4470

Ehimwenma, K. E., Wang, J., Zheng, Z., & Zhou, H. (2022). A symbolic-arithmetic for teaching double-black node removal in red-black trees. *Educational Dimension,* 7, 112–129. https://doi.org/10.31812/educdim.7629

Fadieieva, L. O. (2021). Enhancing adaptive learning with Moodle's machine learning. E*ducational Dimension,* 5, 1–7. https://doi.org/10.31812/ed.625

Fadieieva, L. O. (2023). Adaptive learning concept selection: A bibliometric review of scholarly literature from 2011 to 2019. *Educational Dimension,* 9, 136–148. https://doi.org/10.31812/ed.643

Fedorenko, O. H., Havrysh, O. H., & Velychko, V. Y. (2022). Features of using Moodle tools in the training of future social workers. *Educational Dimension,* 7, 261–281. https://doi.org/10.31812/educdim.4714

Hamaniuk, V. A. (2020). German traces in Ukraine in German lessons: Illustrative, interactive, communicative. *Educational Dimension,* 2, 34–55. https://doi.org/10.31812/educdim.v54i2.3853

Hamaniuk, V. A. (2021). The potential of Large Language Models in language education. *Educational Dimension,* 5, 208–210. https://doi.org/10.31812/ed.650

Herasymenko, O. Y. (2021). Adult education development in independent Ukraine. *Educational Dimension,* 4, 36–49. https://doi.org/10.31812/educdim.v56i4.4403

Herzog, C., Hook, D., & Konkiel, S. (2020). Dimensions: Bringing down barriers between scientometricians and data. *Quantitative Science Studies,* 1 (1), 387–395. https://doi.org/10.1162/qss_a_00020

Horbachova, O. I., Miroshnyk, Z. M., & Soshyna, Y. M. (2022). Methodology of studying the value-semantic readiness for learning. *Educational Dimension,* 6, 108–117. https://doi.org/10.31812/educdim.4468

Horishna, N., Polishchuk, V., Slozanska, H., & Hlavatska, O. (2020). Trends in the development of inclusive education in Ukraine. *Educational Dimension,* 3, 103–116. https://doi.org/10.31812/educdim.v55i0.3953

Ignatenko, O. P. (2022). Exploratory analysis and models for strategic learning towards equilibrium. *Educational Dimension,* 7, 94–111. https://doi.org/10.31812/educdim.4513

Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (2015). https://campaignforeducation.org/images/downloads/f1/245/education2030-framework.pdf

Ivaniuk, I. (2020). Development of a computer-based learning environment in the conditions of

multicultural education in the European Union. *Educational Dimension,* 3, 37–45. https://doi.org/10.31812/educdim.v55i0.4380

Kanevska, O. B. (2021). The didactic potential of the linguistic-stylistic analysis of the text in the lessons of the Russian language. *Educational Dimension,* 4, 122–142. https://doi.org/10.31812/educdim.v56i4.4377

Karpiuk, V. A. (2020). Development of regional and communicative skills when learning German in Kryvyi Rih. *Educational Dimension,* 2, 70–83. https://doi.org/10.31812/educdim.v54i2.3855

Karpiuk, V., Tarasov, A., & Yashyn, V. (2023). Didactic potential of historical research of the Germans in Ukraine. Educational Dimension, 8, 55–67. https://doi.org/10.31812/ed.543

Kazhan, Y. M. (2020). Development of the socio-cultural competence of student teachers on the basis of the findings on the topic «German traces in Ukraine.» *Educational Dimension,* 2, 56–69. https://doi.org/10.31812/educdim.v54i2.3854

Kharkivska, A. A., & Kapustina, O. I. (2021). Overview of modern models of training system future teachers. *Educational Dimension,* 5, 211–223. https://doi.org/10.31812/educdim.4516

Kholoshyn, I. V., Varfolomyeyeva, I. M., Hanchuk, O. V., Bondarenko, O. V., & Pikilnyak, A. V. (2019). Pedagogical techniques of Earth remote sensing data application into modern school practice. *Educational Dimension,* 1, 80–94. https://doi.org/10.31812/educdim.v53i1.3834

Kolgatin, O. H., Kolgatina, L. S., & Ponomareva, N. S. (2022). Stochastic process computational modeling for learning research. Educational Dimension, 6, 68–83. https://doi.org/10.31812/educdim.4498

Kostikov, A. A., Vlasenko, K. V., Lovianova, I. V., Volkov, S. V., & Avramov, E. O. (2022). The Rusch model-based knowledge assessment algorithm. *Educational Dimension,* 6, 40–54. https://doi.org/10.31812/educdim.4482

Kov'áčová, M. (2020). Effects on the use of theater projects in teacher training. Educational Dimension, 2, 134–147. https://doi.org/10.31812/educdim.v54i2.3863

Koval, D. V. (2021). Theoretical principles of modeling the process of forming realistic professional aim of the future psychologist in the conditions of master's training. *Educational Dimension,* 7, 81–93. https://doi.org/10.31812/educdim.4406

Kramarenko, T. H., Pylypenko, O. S., & Zaselskiy, V. I. (2019). Prospects of using the augmented reality application in STEM-based mathematics teaching. *Educational Dimension,* 1, 199–218. https://doi.org/10.31812/educdim.v53i1.3843

Kryvylova, O., Sosnickaya, N., & Oleksenko, K. (2020). Axiological approach to the psychological and pedagogical training of future teachers of the new generation. *Educational Dimension,* 3, 141–155. https://doi.org/10.31812/educdim.v55i0.3954

Kucheriavyi, O. H. (2022). Designing a didactic fairy tale as a key to advanced Physics and Mathematics training in primary schools. *Educational Dimension,* 7, 169–187. https://doi.org/10.31812/educdim.4481

Kukharenko, V. N. (2023). MOOCs: An insider's perspective on a novel educational method with historical, organizational, participatory, and evaluative aspects. *Educational Dimension,* 9, 59–119. https://doi.org/10.31812/ed.610

Kukharenko, V. N., Shunevych, B. I., & Kravtsov, H. M. (2023). Distance learning expert and leader. *Educational Dimension,* 8, 19–40. https://doi.org/10.31812/ed.597

Lavrentieva, O. O., Kuchma, O. I., & Skripnik, L. M. (2020). Designing the content of the educational institution information and consulting environment. *Educational Dimension,* 2, 148–164. https://doi.org/10.31812/educdim.v54i2.3865

Lavrentieva, O. O., Rybalko, L. M., Tsys, O. O., & Uchitel, A. D. (2019). Theoretical and methodical aspects of the organization of students' independent study activities together with the use of ICT and tools. *Educational Dimension,* 1, 27–59. https://doi.org/10.31812/educdim.v53i1.3831

Lehka, L. V., & Shokaliuk, S. V. (2021). Hardware and software tools for teaching the basics of quantum informatics to lyceums students. *Educational Dimension,* 4, 102–121. https://doi.org/10.31812/educdim.v56i4.4440

Lehka, L. V., Shokaliuk, S. V., & Semerikov, S. O. (2023). Exploring the quantum frontier in school

informatics: A pedagogical journey. *Educational Dimension,* 8, 112–142. https://doi.org/10.31812/ed.576

Lovianova, I. V., Bobyliev, D. Y., & Uchitel, A. D. (2019). Cloud calculations within the optional course Optimization Problems for 10th-11th graders. *Educational Dimension,* 1, 95–110. https://doi.org/10.31812/educdim.v53i1.3835

Lytvynova, S., & Demeshkant, N. (2021). Distance learning in primary school during the COVID-19 pandemic: Results of the «SMART KIDS» experiment. *Educational Dimension,* 5, 61–74. https://doi.org/10.31812/educdim.4718

Mintii, I. S. (2023). Blended learning for teacher training: Benefits, challenges, and recommendations. *Educational Dimension,* 9, 1–12. https://doi.org/10.31812/ed.581

Mintii, I. S. (2023). Blended learning: Definition, concept, and relevance. *Educational Dimension,* 8, 85–111. https://doi.org/10.31812/ed.539

Mintii, M. M. (2023). Exploring the landscape of STEM education and personnel training: A comprehensive systematic review. *Educational Dimension,* 9, 149–172. https://doi.org/10.31812/ed.583

Mintii, M. M. (2023). Selection of pedagogical conditions for training STEM teachers to use augmented reality technologies in their work. *Educational Dimension, 8,* 212–239. https://doi.org/10.31812/educdim.4951

Mishenina, T. M. (2023). Historical and pedagogical aspects of foreign language education in Ukraine. *Educational Dimension,* 9, 32–41. https://doi.org/10.31812/ed.591

Mishenina, T. M., & Selyshcheva, I. A. (2021). Formation of the content of the integrative course «Linguoculturology» in the process of professional training of philologists with an additional specialty «History.» *Educational Dimension,* 4, 143–161. https://doi.org/10.31812/educdim.v56i4.4439

Moiseienko, M. V., Moiseienko, N. V., & Kiv, A. E. (2020). Didactic conditions for the formation of digital competence of students of pedagogical universities. *Educational Dimension,* 2, 165–178. https://doi.org/10.31812/educdim.v54i2.3866

Morkun, V. S., Hryshchenko, S. M., Mintii, I. S., Marienko, M. V., & Yechkalo, Y. V. (2021). Requirements for the content and training of PhD in the specialty of automation and computer-integrated technologies. *Educational Dimension,* 4, 77–89. https://doi.org/10.31812/educdim.v56i4.4436

Morze, N. V., Barna, O. V., & Boiko, M. A. (2022). The importance of computational thinking training for primary school teachers. *Educational Dimension,* 6, 22–39. https://doi.org/10.31812/educdim.4466

Nechypurenko, P. P., Semerikov, S. O., & Pokhliestova, O. Y. (2023). An augmented reality-based virtual chemistry laboratory to support educational and research activities of 11th-grade students. *Educational Dimension,* 8, 240–264. https://doi.org/10.31812/educdim.4446

Nechypurenko, P. P., Semerikov, S. O., Selivanova, T. V., & Shenayeva, T. O. (2022). How can the principles of learning be used to select the best ICT tools for computer-based chemistry instruction in high school? *Educational Dimension,* 7, 188–241. https://doi.org/10.31812/educdim.4738

Oleksiuk, V. P., Ivanova, S. M., & Mintii, I. S. (2021). Foreign experience in evaluating the efficiency of scientific and pedagogical research. *Educational Dimension,* 4, 58–76. https://doi.org/10.31812/educdim.v56i4.4435

Osadcha, K., Osadchyi, V., Kruglyk, V., & Spirin, O. (2021). Modeling of the adaptive system of individualization and personalization of future specialists' professional training in the conditions of blended learning. *Educational Dimension, 5,* 109–125. https://doi.org/10.31812/educdim.4721

Ovcharuk, O., & Ivaniuk, I. (2021). A self-assessment tool of the level of digital competence of Ukrainian teachers in the context of lifelong learning: The results of an online survey 2021. *Educational Dimension,* 5, 75–88. https://doi.org/10.31812/educdim.4719

Panasenko, E., Tsvietkova, A., & Berezka, S. (2020). Historical reconstruction of education in author schools of Ukraine. *Educational Dimension,* 3, 60–74. https://doi.org/10.31812/educdim.v55i0.3938

Pershukova, O., Pazyura, N., & Vasiukovych, O. (2023). Using interactive learning in future aviation professionals teaching English. *Educational Dimension,* 8, 41–54. https://doi.org/10.31812/ed.584

Piankovska, I. V. (2020). Exercise types for reading comprehension in foreign language classes. *Educational Dimension*, 2, 84–100. https://doi.org/10.31812/educdim.v54i2.3871

Piatykop, O. I., Pronina, O. I., Tymofieieva, I. B., & Palii, I. D. (2022). Early literacy with augmented reality. *Educational Dimension,* 6, 131–148. https://doi.org/10.31812/educdim.4491

Pinchuk, O., & Prokopenko, A. (2021). Actual areas of development of digital competence of officers of the Armed Forces of Ukraine. *Educational Dimension,* 5, 89–108. https://doi.org/10.31812/educdim.4720

Popel, M. V., & Shyshkina, M. P. (2019). The areas of educational studies of the cloud-based learning systems. *Educational Dimension,* 1, 60–79. https://doi.org/10.31812/educdim.v53i1.3832

Proskura, S., Lytvynova, S., & Kronda, O. (2021). The use of web-oriented technologies in the process of web-programming teaching for technical universities students. *Educational Dimension,* 5, 161–177. https://doi.org/10.31812/educdim.4724

Prykhodkina, N., & Makhynia, T. (2020). Using of social media in school management: Experience of Ukraine and the United States of America. *Educational Dimension,* 3, 181–198. https://doi.org/10.31812/educdim.v55i0.3952

Pylypenko, O. (2020). Development of critical thinking as a means of forming STEM competencies. *Educational Dimension*, 3, 317–331. https://doi.org/10.31812/educdim.v55i0.3955

Rashevska, N. V., & Kiianovska, N. M. (2023). Improving blended learning in higher technical education institutions with mobile and cloud-based ICTs. *Educational Dimension,* 9, 13–31. https://doi.org/10.31812/ed.608

Riezina, O. V., Puzikova, A. V., & Kotyak, V. V. (2022). The experience of thesis writing in terms of the methodological students' digital competence development. *Educational Dimension,* 7, 242–260. https://doi.org/10.31812/educdim.4715

Seidametova, Z. S. (2022). Some methods for improving data structure teaching efficiency. Educational Dimension,, 6, 164–175. https://doi.org/10.31812/educdim.4509

Semerikov, S. O. (2021). Educational Technology Quarterly: A new journal on the future of education in the digital age. *Educational Dimension,* 5, 179–180. https://doi.org/10.31812/ed.651

Semerikov, S. O., & Mintii, I. S. (2020). Mapping lifelong learning quality: A bibliometric study. *Educational Dimension*, 3, 1–8. https://doi.org/10.31812/ed.622

Semerikov, S. O., & Nechypurenko, P. P. (2020). Adapting science education during crises: First lessons from the COVID-19 pandemic. *Educational Dimension,* 2, 1–6. https://doi.org/10.31812/ed.621

Semerikov, S. O., Spirin, O. M., Vakaliuk, T. A., Mintii, I. S., Ivanova, S. M., & Shymon, O. M. (2023). Assessing the effectiveness of research and academic staff's scientific activity: Definition of criteria and indicators. *Educational Dimension*, 9, 215–227. https://doi.org/10.31812/ed.605

Semerikov, S. O., Vakaliuk, T. A., Mintii, I. S., Hamaniuk, V. A., Soloviev, V. N., Bondarenko, O. V., Nechypurenko, P. P., Shokaliuk, S. V., Moiseienko, N. V., & Shepiliev, D. S. (2022). Design methodology for immersive educational resources. *Educational Dimension,* 6, 176–199. https://doi.org/10.31812/educdim.4716

Semerikov, S. O., Vakaliuk, T. A., Mintii, I. S., Hamaniuk, V. A., Soloviev, V. N., Bondarenko, O. V., Nechypurenko, P. P., Shokaliuk, S. V., Moiseienko, N. V., & Ruban, V. R. (2021). Development of the computer vision system based on machine learning for educational purposes. *Educational Dimension*, 5, 8–60. https://doi.org/10.31812/educdim.4717

Shapovalov, V. B., Shapovalov, Y. B., Bilyk, Z. I., Megalinska, A. P., & Muzyka, I. O. (2019). The Google Lens analyzing quality: An analysis of the possibility to use in the educational process. *Educational Dimension*, 1, 219–234. https://doi.org/10.31812/educdim.v53i1.3844

Shapovalov, Y. B., Shapovalov, V. B., Bilyk, Z. I., & Shapovalova, I. M. (2022). Structurization of educational expedition studies in the form of taxonomies. *Educational Dimension,* 7, 130–149. https://doi.org/10.31812/educdim.7618

Sherman, M., & Yurzhenko, A. (2020). Experimental research on the formation of future ship engineers' communicative competence based on gamification approach. *Educational Dimension*, 3, 251–266. https://doi.org/10.31812/educdim.v55i0.3939

Slovak, K. I. (2023). A methodological framework for using cloud-based mobile mathematical environments in higher education. *Educational Dimension,* 9, 173–205. https://doi.org/10.31812/ed.609

Striuk, A. M. (2021). Problematic questions of software requirements engineering training. *Educational Dimension,* 4, 90–101. https://doi.org/10.31812/educdim.v56i4.4441

Striuk, A. M. (2022). Formation of software design skills among software engineering students. *Educational Dimension,* 6, 1–21. https://doi.org/10.31812/educdim.4519

Striuk, A. M. (2023). Enhancing software engineering education in higher education institutions through cloud-based learning tools: Methodological and practical perspectives. *Educational Dimension,* 8, 168–186. https://doi.org/10.31812/ed.600

Stupak, K. (2020). Implementation of reflective model of educational practice in the modern Finnish school. *Educational Dimension,* 3, 46–59. https://doi.org/10.31812/educdim.v55i0.4378

Svatenkova, T. I., & Svatenkov, O. V. (2023). A teenager's psychological potential actualizing model in the children's health and recreation facility developmental environment. Educational Dimension, 9, 228–243. https://doi.org/10.31812/ed.642

Sydorenko, V., Kravchynska, T., Aleinikova, O., & Dubinina, O. (2020). Marketing of educational services for continuous professional development of modern educator. *Educational Dimension,* 3, 75–92. https://doi.org/10.31812/educdim.v55i0.3941

Ternavska, T. A. (2021). Research of the phenomenon of professional burnout of employees of the socio-pedagogical sphere. *Educational Dimension,* 4, 162–170. https://doi.org/10.31812/educdim.v56i4.4438

Tkachuk, V. V., Yechkalo, Y. V., Semerikov, S. O., Khotskina, S. M., Markova, O. M., & Taraduda, A. S. (2022). Distance learning during COVID-19 pandemic: Mobile information and communications technology overview. *Educational Dimension,* 7, 282–291. https://doi.org/10.31812/educdim.7612

Tokarieva, A. V., Volkova, N. P., Harkusha, I. V., & Soloviev, V. N. (2019). Educational digital games: Models and implementation. *Educational Dimension,* 1, 5–26. https://doi.org/10.31812/educdim.v53i1.3872

Tymoshko, A., Dubinina, O., Kravchynska, T., Burlaienko, T., & Sholokh, E. (2020). Information support for quality management of education in general educational institutions of Ukraine. *Educational Dimension,* 3, 285–302. https://doi.org/10.31812/educdim.v55i0.3949

UNESCO Institute for Statistics (2023). *Official list of SDG 4 indicators.* https://tcg.uis.unesco.org/wp-content/uploads/sites/4/2020/09/SDG4_indicator_list.pdf

Ustymenko, V. V., & Hamaniuk, V. A. (2023). On the question of the establishment and development of languages education in Canada (XVII - the beginning of XXI century). *Educational Dimension,* 8, 68–84. https://doi.org/10.31812/ed.579

Varina, H. B., Osadchyi, V. V., Goncharova, O. A., & Sankov, S. M. (2022). Features of gamification component introduction during the development of constructive strategies for overcoming youth life crises. *Educational Dimension,* 6, 84–107. https://doi.org/10.31812/educdim.4454

Vasko, O. O., & Bilier, O. S. (2023). Online lecture strategies for quality training of future primary school teachers. *Educational Dimension,* 9, 120–135. https://doi.org/10.31812/ed.644

Vasyliuk, T. G. (2021). Model of formation of social competence of students in the process of studying the disciplines of the humanitarian cycle. *Educational Dimension,* 4, 171–182. https://doi.org/10.31812/educdim.v56i4.4383

Velychko, V. Y., Fedorenko, E. G., Kaidan, N. V., & Kaidan, V. P. (2022). Some aspects of the use of cloud computing in the training of physics teachers. *Educational Dimension,* 7, 150–168. https://doi.org/10.31812/educdim.7615

Vlasenko, K., Rovenska, O., Lovianova, I., Korchagina, S., Zahrebelna, H., & Dmytryshyn, I. (2020). On arranging the procedure of public debate on the educational curriculum draft for Master students majoring in 014 Secondary Education (Mathematics), academic discipline 01 Education/Pedagogics. *Educational Dimension,* 3, 303–316. https://doi.org/10.31812/educdim.v55i0.4341

Volkova, N. P. (2022). Technologically organized instructional process of higher education. *Educational Dimension*, 7, 21–80. https://doi.org/10.31812/educdim.4444

Voloshynov, S. A., Riabukha, I. M., Dobroshtan, O. O., Popova, H. V., & Spychak, T. S. (2021). Adaptive learning environment design in the system of future maritime specialists' training. *Educational Dimension*, 5, 126–143. https://doi.org/10.31812/educdim.4722

Vyrsta, N. B. (2020). Didacticization of the press texts of the Galician Germans in DaF-lessons. *Educational Dimension*, 2, 20–33. https://doi.org/10.31812/educdim.v54i2.3852

Yarhere, I. E., & Chinnah, T. I. (2023). Paediatric endocrinology curriculum content uniformity across medical schools in Southern Nigeria: Lecturers' report. *Educational Dimension*, 8, 1–18. https://doi.org/10.31812/ed.538

Yurzhenko, A., Diahyleva, O., & Kononova, O. (2023). An overview of Maritime English teaching and its principles, with a focus on practical applications and best practices online. *Educational Dimension*, 9, 42–58. https://doi.org/10.31812/ed.641

Zadorozhnyi, V. M. (2020). The use of Arduino software and hardware in a school physical experiment. *Educational Dimension*, 2, 122–133. https://doi.org/10.31812/educdim.v54i2.3861

Zahorodko, P. V. (2023). Overview of Agile frameworks in Computer Science education. *Educational Dimension*, 9, 206–214. https://doi.org/10.31812/ed.645

Zenkovych, I. O. (2021). Formation of students' readiness for leadership of pupils' artistic-and-creative activities at the fine arts lessons. *Educational Dimension*, 5, 181–193. https://doi.org/10.31812/educdim.4442

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ОСВІТНІЙ ВИМІР СТАЛОГО РОЗВИТКУ: АНАЛІТИЧНИЙ ОГЛЯД

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Ціль ООН у галузі сталого розвитку 4 (ЦСР 4) спрямована на забезпечення інклюзивної та справедливої якісної освіти та сприяння можливостям навчання протягом усього життя для всіх до 2030 року. Ця амбітна програма вимагає ґрунтовних досліджень у різних освітніх сферах для інформування ефективної політики та практики. У цій статті проаналізовано 106 статей, опублікованих у журналі «Освітній вимір» з 2019 по 2023 рік, проаналізовано їх відповідність десяти цілям ЦСР 4. Аналіз показує, що журнал зробив значний внесок у дискусії щодо інтеграції новітніх технологій в освіті, розробки навчальних програм, методик викладання та професійного розвитку педагогів. Однак виявлено прогалини у вирішенні конкретних цілей, таких як розширення стипендіальних програм, просування освіти для сталого розвитку та глобального громадянства, а також задоволення потреб маргіналізованих груп. Огляд також підкреслює необхідність більшої географічної різноманітності та

міждисциплінарних підходів у опублікованих дослідженнях. Хоча журнал «Освітній вимір» зробив помітний внесок, результати підкреслюють необхідність ширшої співпраці, різноманітних дослідницьких поглядів та контекстно-специфічних ідей для всебічної підтримки досягнення ЦСР 4 у всьому світі. У статті наголошується на вирішальній ролі наукових журналів у просуванні якісних освітніх досліджень та формуванні політики сталого розвитку на основі фактичних даних.

Ключові слова: *аналіз літератури, навчання протягом усього життя, освіта, сталий розвиток, ЦСР 4, якість освіти.*