Bridging Curriculum and Sustainable Development: A Mapping approach for Global Competencies

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Abstract. This article considers the mapping of the subject programme "World Understanding" content of the 4th grade using 55 indicators developed by the Global Cities, Inc. program initiated by Bloomberg Philanthropies. These indicators serve as qualitative measures of educational content and functional literacy, including global competencies. The purpose of the study is to analyze the integration of education for sustainable development into the assessment system through the development of global competencies. The study is aimed at assessing the impact of global competencies on the formation of students' knowledge and skills necessary for solving global problems, as well as analyzing existing approaches in educational practice and the assessment system in order to improve mechanisms for achieving the Sustainable Development Goals. The findings reveal that 78% of the indicators (43 out of 55) identified through the mapping method and subject programme analysis align with the global competence indicators. This confirms that the indirect integration of global competencies is an effective tool that requires appropriate teacher training for full implementation.

Key words: global competencies, mapping, subject programme, functional literacy, teacher training, assessment.

Introduction

In 2015, Kazakhstan committed to implementing the UN Sustainable Development Goals (SDGs) [1]. The education system plays a crucial role in the Global Agenda for Sustainable Development. This is especially evident in SDG 4, which aims to ensure inclusive and quality education for all. An important part of this goal is target 4.7, which focuses on developing knowledge and skills that contribute to sustainable development. UNESCO indicates this approach as "Education for Sustainable Development" (ESD), which is a catalyst for achieving all SDGs by 2030 [2]. In this context, global competencies play a key role, forming in students the knowledge and skills necessary to solve global problems and adapt to change.

Global competencies include knowledge, skills and values that allow students to interact effectively in a complex and interconnected world. They promote active participation in educational activities, learning about other cultures and expanding horizons on global challenges. Despite existing approaches, many aspects of integrating these competencies into the assessment system remain understudied, making this area promising for further research.

In 2018, the PISA study introduced assessments of "global competencies" for the first time, complementing the traditional assessment areas of mathematical, reading, and scientific literacy. These assessments measure the degree of readiness of young people for life in a globalized and culturally diverse world, including the ability to critically understand intercultural issues and promote sustainable development. Kazakhstan showed results in this area, with an average score of 408 points, which is significantly lower than the average for participating countries (474 points), according to the OECD report. The lowest results were recorded in cognitive tests, which include analyzing global and intercultural issues, understanding different points of view, and promoting shared well-being. These data highlight the need to integrate global themes into educational programmes to improve the level of global competence of students [3].

The reform of the secondary education system in Kazakhstan began in 2016, and schools started to implement updated curriculum. The main emphasis was placed on the transition from the knowledge transfer model to the competency development model. As part of this reform, the secondary education system is focused on the development of four key skills: creativity, critical thinking, communication skills, and the ability to work in a team (4K model) [4].

For this purpose, a study was conducted to analyze the content of the subject programme using the example of the subject "World Understanding" for the 4th grade. The analysis was based on 55 indicators developed within Global Cities, Inc., a Program of Bloomberg Philanthropies initiative. These indicators are the quality measures of educational content and the level of functional literacy, including global competencies. Particular attention is paid to key components of global competencies, such as Appreciation for Diversity, Cultural Understanding, Global Knowledge, and Global Engagement [5].

These days education that meets the indicators of soft competencies provides opportunities, helping to prepare students for the realities of a global society and new challenges. It assists ensuring the relevance of curriculum in accordance with the changing requirements of the labor market, as well as improving their content in the interests of the individual and society.

The purpose of the study is to analyze the integration of education for sustainable development into the assessment system through the development of global competencies. This is an important step toward an educational environment that addresses the challenges of sustainable development. The study will examine the impact of global competencies on the formation of students' knowledge and skills needed to solve global problems. It will also analyze existing approaches in educational practice and the assessment system in order to improve the mechanisms for achieving the SDGs.

Consequently, this study has both theoretical and practical significance. It contributes to the development of educational practices focused on a sustainable future and will help develop effective mechanisms for integrating global competencies into the system for assessing educational achievements.

In the 21st century, students need to develop global competencies necessary for successfully navigating a rapidly changing world. These competencies include intercultural communication skills, critical thinking, participation in solving global problems, and adaptation to diverse socio-cultural contexts. However, the quality of education is largely determined by the assessment system, which, in turn, depends on the curriculum, learning objectives, and expected outcomes. Integrating global competencies into subject programmes is becoming a priority task, and a necessary condition for preparing students for modern challenges. In this regard, mapping subject programmes is of particular importance to identify and assess the degree of global competencies integration, as well as the development of appropriate teacher training at universities.

In recent years, there has been a significant increase in interest in the study of global competencies and their integration into educational systems. International organizations such as the OECD, UNESCO and other are actively developing conceptual approaches and methodological recommendations for their formation. Global competencies cover a wide range of knowledge, skills, and values that help prepare students for life in a globalized world [6]. However, despite the growing attention to this issue, the effective assessment issue of these competencies in the educational process remains important.

Assessment plays a crucial role in ensuring the quality of education, as it allows us to determine how successfully students master global competencies. In this context, Lorrie A. Shepard emphasizes the importance of formative assessment and its impact on educational outcomes. The author considers assessment as an integral part of the learning process, aimed at supporting the student's development, and not simply measuring their achievements [7]. The study of Paul Black and Dylan William also focuses on the importance of formative assessment. They note that assessment should be integrated into the learning process and contribute to the development of students' understanding and skills, and not be reduced to a final knowledge test. This approach improves the quality of learning and promotes better assimilation of the material [8].

Hattie J. and Anderman E. M., who consider the factors influencing educational outcomes, also emphasize the importance of formative assessment. The authors highlight the transparency of educational goals and the systematic use of formative assessment as key conditions for increasing the motivation and academic performance of students [9].

The study by S.K. Zhumazhanova, M.O. Mussabayeva and S.Zh. Zhagparova analyzes the difficulties that teachers face in transforming general learning goals into specific lesson goals, developing assessment criteria and descriptors for assignments. The authors note the insufficient use of various assessment methods and techniques in schools, which indicates the need to improve the system of pedagogical measurements [10].

In addition, international studies such as PISA 2018 highlight the need to develop more integrated and culturally sensitive approaches to assessing global competencies [11]. Existing methods do not always take into account the diversity of cultural and socio-economic contexts, which can reduce the objectivity of the results. Yu and Duchin highlight the significance of incorporating courses into subject programmes aimed at fostering social entrepreneurship and digital competencies essential for students' effective adaptation to the global environment [12].

To integrate global competencies effectively into the education system, it is necessary to align subject programmes. Crawford, Higgins, and Hilburn propose the implementation of the global competence model in the subject programme design course, which is an important step in the development of pedagogical practice [13]. In this context, the study Education 2030 Curriculum Content Mapping: An Analysis of the Netherlands Curriculum Proposal, conducted by the OECD, is an analysis of the mapping of subject programmes content and their alignment with global competencies. This experience can be useful in developing national strategies for the integration of global competencies [14]. Therefore, Robertson suggests adapting the assessment standards of global competencies to local characteristics, emphasizing the need to balance international standards and national educational priorities [15].

The preparation of future teachers plays a key role in the successful integration of global competencies into the educational process. Kerkhoff and Cloud emphasize the importance of integrating global competencies into teacher training programmes, especially in the aspects of intercultural communication, critical thinking, and civic responsibility [16]. The study by Rahman, Liu, and Buck examines the training of primary school teachers in the field of natural sciences, which contributes to the development of global knowledge and competencies, especially in rural areas where special teaching strategies are required [17].

Therefore, high-quality education in the 21st century is impossible without the integration of global competencies into subject programmes and assessment systems considering national peculiarities. Conducting subject programmes mapping will help determine the level of their compliance with modern educational requirements, and teacher training will ensure the effective development of global competencies in students. The introduction of indicators developed within the framework of the Global Cities program can become the basis for effective assessment and development of global competencies in the educational system of Kazakhstan, ensuring compliance with international standards.

Methodology

The aim of this study was to map and analyze the subject programme content of the subject "World Understanding" for the 4th grade in order to assess the effectiveness and quality of the learning process aimed at developing functional literacy and global competencies among

students. Particular attention was paid to the integration of global competencies into the content of subject programmes and their compliance with relevant international indicators.

The following research questions were formulated during the study: How effectively are topics and objectives aimed at developing global competencies included in the updated subject programmes? To what extent is it possible to integrate global competencies indicators into the content of other subjects and grades? How can subject programmes mapping contribute to the improvement of educational practices and the quality of education in modern conditions?

The subject programmes mapping method is a systematic approach to analyzing the content of educational courses by comparing their structure, objectives, and expected outcomes with predetermined indicators or standards. This method is widely used in international comparative studies to assess the quality of education and identify gaps in the subject programmes [18].

In this study, mapping was used to identify the degree of global competencies integration into the content of the subject "World Understanding" for grade 4. The analysis was based on 55 indicators of global competencies of Global Cities, which were structured into four areas [5].

The mapping method allows determining which components of the subject programme correspond to international educational standards, also to identify possible areas for its improvement. This method is widely used in OECD practice, including studies on global competencies of students [14].

The main hypothesis was that the use of the subject programme mapping method using indicators of global competencies would contribute to more effective integration, which, as a result, will improve the quality of education focused on the development of flexible competencies in students. It was assumed that mapping would become a useful tool for teachers and educational organizations, allowing them to adapt curriculum and improve the educational process as a whole.

The study was conducted in several consistent stages:

1. The preparatory stage included a comprehensive analysis of the research concept, selection of the subject and analysis of current approaches to the development of global competencies. The object of the study was the subject programme for the subject "World Understanding" for grade 4 [19].

2. The main stage involved the application of the mapping method using the Global Cities global competence indicators. At this stage, a structural comparison of the subject programme content was conducted with 55 global competence indicators, which made it possible to identify potential areas for improvement.

3. The analytical stage included interpretation of the data obtained, formulation of conclusions and development of recommendations for the integration of global competencies into the subject programmes.

A qualitative analysis of the content of educational materials was used to process the data. The mapping method made it possible to conduct a structural comparison of the subject programme elements with international indicators of global competencies.

The following factors were considered when analyzing the content of the subject programme:

• Learning objectives and expected outcomes (8 strands, 15 sub-strands, 31 learning objectives);

• Possibility of direct, functional and contextual alignment with global competence indicators.

The mapping methodology was based on three levels of alignment between learning objectives and global competence indicators. (Table 1)

Table 1

Mapping the subject programme of the subject "World Understanding"

Learning Objectives	Global Cities Indicators
4.1.2.2 determine personal qualities of a leader	– no alignment
4.3.5.2 **determine** the *role of Kazakhstan* <u>on the global stage</u>	**3-AD** *Awareness of one's city and how it relates to other cities around the world (contextual)* **20-CU** <u>Understanding of one's city and how it relates to other cities around the world</u> *(direct)* **42-GE** <u>Interest in the larger world, particularly unfamiliar people and places</u> *(direct)* **51-GE Gathering and interpreting information from people in one's own city and culture** *(functional)*

1. Direct alignment – established when terminology matches. For example, learning objective 4.1.3.2 ("describe economic actors in a region based on a variety of sources") directly corresponds to indicator 29-GK, related to economic and political knowledge.

2. Functional alignment – involves comparing learning objectives with behavioral indicators of global interaction. For example, indicators 51-GE (collect and interpret information in a cultural context) and 53-GE (provide information in one's social environment) correspond to learning objectives focused on developing skills for explaining and exchanging information.

3. Contextual correspondence – revealed when correlating the topics of history, society, politics, and economics with cultural and historical indicators. For example, indicators 1-AD (awareness of the influence of broad cultural and historical factors) and 18-CU (understanding the relationship between cultural and historical contexts) can be associated with objectives aimed at studying the corresponding topics.

The application of this methodology allowed us to conduct a detailed analysis of the subject programmes content, identify key topics that contribute to the development of global competencies, and offer recommendations for their further integration.

The mapping method used in this study is of high practical significance. Unlike traditional methods of subject programmes analysis, it allows not only to assess the content of the programme, but also to identify opportunities for integrating global competencies at the level of the entire educational system.

The subject programmes mapping method can be widely used by teachers and curriculum developers to improve the educational process, focusing it on solving urgent global problems and developing flexible competencies in students.

The Global Cities Codebook's Guide for Curriculum Design and Instruction provided methodological support for the authors of the article, which became the main tool for working

with indicators [20]. This document facilitates to assess the value of each indicator, and to apply them within the subject programmes correctly. It could also be adapted to enhance the integration of other competencies into subject programmes.

The results of the study confirmed the hypothesis that the mapping method using global competency indicators is an effective tool for improving subject programmes and enhancing their quality. The use of this approach contributes to the structural analysis of the educational material, and to its adaptation in accordance with international educational standards.

In this way, the mapping method is a promising methodological solution aimed at developing education focused on the formation of global competencies in students.

Discussion and Results

The subject "World Understanding" is a part of the primary education subject programme for grade 4 in Kazakhstan since the beginning of the curriculum reform in 2016. The subject is taught one hour per week, for a total of 36 hours per academic year. It covers a wide range of topics designed to enhance students' understanding of their homeland and the world. The programme includes studying social phenomena of the past and present, exploring social relationships, understanding family and community relations, and raising awareness of roles in society. In addition, it aims to develop respect for one's own and other cultures, foster empathy, and teach students a humane attitude towards people and the environment. The subject is integrated with activities that promote critical thinking, creative application of knowledge, and the use of information and communication technologies.

The programme uses a learning objective coding system for use. The first number in the code represents the class, the second and third number represent the strand and sub-strand, and the fourth number represents the specific learning objective. For example, in code 4.2.1.4, "4" indicates grade 4, "2.1" - sub-strand, and "4" indicates a specific learning objective [19].

The results of the mapping and comparative analysis demonstrated that 43 out of 55 Global Cities indicators were reflected in the content of the learning objectives of the subject programme "World Understanding" for grade 4. This is 78% of alignment (Figure 1). However, it is worth noting that more than half of these indicators were integrated indirectly, which can be regarded as indirect integration of global competencies into the subject programme. Indirect integration of the global competence component into the content of secondary education turned out to be no less effective than direct integration, although the successful implementation of such a model requires appropriate training of teachers.
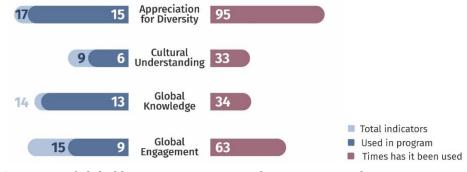

Figure 1. Overview of global learning outcomes and programme indicators

The analysis of the alignment level of the curriculum content of the subject "World Understanding" of the 4th grade with the developed indicators of global competence demonstrated several important aspects (Table 2). Firstly, the current content of the curriculum retains an excessive emphasis on theoretical aspects, which leads to insufficient emphasis on the development of practical skills, such as initiative, the ability to solve problems and make decisions in real life situations. This emphasizes the importance of integrating active learning methods into the educational process, aimed at developing critical thinking and decision-making abilities.

Table 2

Alignment Table of Learning Objectives with Indicators of Global Cities

Strand	Sub-strand	Learning objectives	Indicators
2 Values	1.1 Me and My Family	4.1.1.1 argue the significance of the family in society; 4.1.1.2 analyze the functional roles of family members; 4.1.1.3 analyze income and expenses of the family budget; 4.1.1.4 propose ways to optimize the family budget	2-AD Awareness of one's culture (behaviors, identity, beliefs) 10-AD Positive attitude towards one's own culture 11-AD Tolerance of differences 13-AD Willingness to interact with peers and adults of different backgrounds respectfully 14-AD Willingness to work collaboratively with peers and adults of different backgrounds to achieve shared goals 19-CU Understanding of one's culture (behaviors, identity, beliefs) 51-GE Gathering and interpreting information from people in one's own city and culture 53-GE Presenting information, formally and informally, to people in one's own city and culture
	1.5 Rights and Responsibilities	4.1.2.1 explain the ways to join the school self-governance; 4.1.2.2 determine personal qualities of a leader 4.1.5.1 make conclusions about the significance of the Constitution in social life; 4.1.5.2 provide examples of democratic rights, freedoms, and responsibilities as a citizen of the Republic of Kazakhstan	1-AD Awareness of how one's life and the lives of others are influenced by broader cultural and historical contexts 2-AD Awareness of one's culture (behaviors, identity, beliefs) **5-AD Awareness of one's identity as a citizen of one's city** *(direct)* 10-AD Positive attitude towards one's own culture 11-AD Tolerance of differences 13-AD Willingness to interact with peers and adults of different backgrounds respectfully

			14-AD Willingness to work collaboratively with peers and adults of different backgrounds to achieve shared goals 16-AD Working collaboratively with people of different backgrounds to achieve shared goals **18-CU Understanding how one's life and the lives of others are influenced by broader cultural and historical contexts** *(direct)* 19-CU Understanding of one's culture (behaviors, identity, beliefs) 29-GK Knowledge of economics and politics and their impact 45-GE Recognizing one's capacity to advocate for and contribute to local, regional, or global improvement 51-GE Gathering and interpreting information from people in one's own city and culture 53-GE Presenting information, formally and informally, to people in one's own city and culture

However, the analysis demonstrated that there is considerable scope for strengthening the global competence component of the Grade 4 curriculum through indirect integration. The further effectiveness of this process depends directly on the qualifications of teachers and their ability to use a creative approach to teaching. It is important that teachers engage students in a variety of activities that develop the skills needed to work with different sources of knowledge, apply what they have learned in real life, and understand global and local issues.

A graduate should be able to apply the acquired knowledge and skills to solve life problems in various fields of activity. These skills include mathematical, reading, natural science and financial literacy, as well as global competencies and creative thinking. Currently, there is no universal methodology for developing functional literacy and global competence, but an integrated approach using various methods, techniques and teaching tools, such as Global Cities indicators, allows achieving high results in teaching and assessing the content of subject programmes.

The mapping and comparative analysis showed that a direct impact on improving the quality of school education can be achieved through developing teachers' understanding of the relationship between the content of the curriculum and global competencies. Understanding the importance of integrating global competence components into the educational process also contributes to improving student performance and allows them to develop the necessary skills for success in a global context.

In addition, the research results emphasize the need to create an assessment system that

tracks students' progress in achieving global learning outcomes and the level of development of soft competencies. The Global Cities indicator system can be applied for this purpose, which serves as a tool for improving subject programmes and assessing the quality of education.

Within the framework of the proposed methodology, two options for mapping learning objectives and global competence indicators were considered. The authors chose the first option - analysis of each learning objective for correlation with all priority indicators - as the main one. The second option - analysis of each indicator for its correlation with learning objectives - also proved its effectiveness, but was considered less convenient for analyzing the subject programme as a whole. As a result, the first mapping option associated with the analysis of learning objectives was the most effective for identifying the correspondence between the educational material and the indicators of global competencies.

It is also important to note that certain difficulties were identified in selecting the maximum correspondence between the criteria of indicators and learning objectives. This process required constant feedback and adjustment, which ensured the accuracy of the selected mapping directions.

The results of the study confirm that the integration of global competencies into primary education subject programmes is an important task that requires a systematic approach. The analysis of the content of the subject "World Understanding" for the 4th grade in Kazakhstan demonstrated a high level of compliance of the learning objectives with the Global Cities indicators. However, the integration is primarily indirect, which presents the challenge of finding more effective methods for integrating global competencies into the educational process.

According to the data in Table 2, 78% of the Global Cities indicators were reflected in the subject programme, but only a small part of them were included directly. This is in line with the findings of Crawford, Higgins, and Hilburn, who point to the need for explicit and targeted integration of global competencies into the subject programmes, as well as the importance of preparing teachers to work in a globalized education environment [13].

Similar results are demonstrated by the research of Robertson, who emphasizes the balance between international standards and national educational priorities [15]. In this context, it is important to note that the educational programmes of Kazakhstan are formed taking into account national identity and traditional values, which may limit the degree of implementation of global competencies in their classical sense.

These findings support the findings of S. Zhumazhanova, M. Mussabayeva, and Zhagparova on the difficulties of translating general learning objectives into specific lesson objectives, especially in terms of developing assessment criteria [21]. The inclusion of global competencies in the content of the "World Understanding" subject is largely left to the discretion of teachers, which reduces the effectiveness of the process and requires additional teacher training.

As noted by Shepard and Black & Wiliam, assessment is a key factor determining the success of educational reforms [7, 8]. Our study found a lack of formative assessment in the learning process, which confirms the earlier findings of Hattie & Anderman [9]. In a context where most global competencies are integrated indirectly into the learning process, formative assessment can play an important role in strengthening their practical application.

The results of the study demonstrate several key areas for further development of the education

system in Kazakhstan. First, it is necessary to develop methodological recommendations for teachers that contribute to deepening the global component in the subject programmes, especially in terms of practice-oriented learning. As noted by Kerkhoff and Cloud [16], successful integration of global competencies is impossible without targeted training of teachers.

Second, it is important to adapt global competencies assessment models to the cultural and socioeconomic realities of the country, which is supported by the findings of Robertson [15]. As our analysis showed, despite the high level of inclusion of global competencies indicators in the subject programme, their practical application remains limited.

Third, it is necessary to expand the use of active learning methods, such as project and research activities, and work with digital technologies. According to Yu & Duchin [12], the development of global competencies requires students to engage in real-life problem situations, which is confirmed by the findings of Rahman, Liu, and Buck on the importance of developing intercultural communication and digital skills in learners.

Thus, the results of our study confirm the importance of using the subject programme mapping method used in OECD studies to analyze the integration of global competencies into educational systems. The inclusion of Global Cities indicators allows not only to assess the degree of their incorporation in the subject programmes, but also to identify problem areas that require further improvement.

However, there is a need to further study the effectiveness of various strategies for integrating global competencies into national curriculum. In particular, a promising direction for future research may be to analyze the impact of teacher training on the success of the implementation of global competencies, as well as the development of assessment tools adapted to the national context.

Therefore, the conducted study emphasizes the importance of a structural approach to the formation of global competencies in the educational process and the need to improve the methodology of their integration and assessment in the context of modern education. The results of our study confirm that the integration of global competencies into primary education curriculum is an important task that requires a systematic approach. The content analysis of the subject "World Understanding" for grade 4 demonstrated a high level of alignment of the learning objectives with the Global Cities indicators. However, the integration of these competencies into the educational process remains largely indirect. This highlights the need to improve the assessment system and more actively include assessment in the educational process.

As the study shows, despite the high compliance of the curriculum content with the Global Cities indicators, the emphasis in the learning process is still on theoretical learning, which limits the development of practical skills. In this regard, criterion-based and formative assessment can become important tools for strengthening the practical component of the curriculum, as they allow students to participate in the learning process, developing self-regulation and mindfulness skills.

One of the most important aspects of the successful integration of global competencies into the educational process is the training of teachers. As the guide (2024) points out, for the effective implementation of formative assessment, teachers need skills that include methodological competence, the ability to develop assessment criteria and descriptors, as well as the ability to

reflect on the learning process [21]. Without this, it is impossible to properly integrate global competencies into their classes, as well as assess their development in students.

Conclusion

The results of the study showed that the mapping method and comparison of the learning objectives of the "World Understanding" subject programme for grade 4 with the global competence indicators revealed a high degree of alignment. 43 out of 55 indicators (78%) were reflected in the content of the programme, but more than half of them were integrated indirectly. This confirms that the indirect integration of global competencies into the content of the curriculum, although indirect in nature, is also an effective tool that requires appropriate training of teachers for full implementation.

Despite the positive results, the analysis of the curriculum showed that it still contains a significant theoretical component, while the emphasis on the practical application of knowledge, solving real-life problems and developing initiative remains insufficient. This emphasizes the need to strengthen the practical focus of the learning objectives, as well as the introduction of more active teaching methods aimed at developing critical thinking and the ability to make decisions in real situations.

The results of the study also showed that the success of the integration of global competencies directly depends on the qualifications of teachers. To implement these competencies effectively, it is important for teachers to use creative and innovative teaching methods, engaging students in the process of research, discussion and application of knowledge in practice. Teachers need not only to have deep knowledge of the subject, but also to have the skills to adapt the educational process to the current changes.

In addition, the study revealed the lack of a unified methodology for developing functional literacy and global competencies among schoolchildren. However, the use of the mapping method using indicators has proven its effectiveness, allowing these competencies to be integrated into the content of various school subjects and improving existing curriculum.

Assessment, as an important component of the educational process, also turned out to be key in integrating global competencies into subject programmes. The study proposed creating an assessment system that tracks students' progress in achieving global learning outcomes and the level of development of flexible competencies. This assessment system should not only assess students' achievements but also encourage their active participation in the learning process, helping to develop 21st century skills such as critical thinking, intercultural communication, and problem solving. It is important that assessment is integrated with learning and takes into account both the knowledge and practical skills of students.

Based on the analysis, the following recommendations are made:

1) Retrain professionally teachers and subject programmes developers to better integrate global competency indicators.

2) Develop elective courses focused on global competency development, sustainable development, human rights, and intercultural communication.

3) Create an assessment system that tracks students' progress toward global learning

outcomes and promotes the development of essential 21st century skills such as critical thinking, intercultural communication, collaboration, and civic responsibility.

The mapping method used in this study not only allows for the analysis of curricula's alignment with global competencies, but also promotes a systematic approach to improving the content of educational materials. This approach will help to adapt subject programmes to the needs of the globalized world and improve their compliance with modern educational requirements. In the future, the mapping method and the use of global competency indicators can become the basis for the formation of a more flexible and effective educational system focused on the development of critical thinking, intercultural communication, and solving global problems. Assessment integrated with these methods will become an important tool for developing the skills in students necessary for successful adaptation in a rapidly changing world. This will help prepare students for the challenges of modern society and the globalized world.

Contribution of the authors

In writing this article, the authors' contributions are equally distributed and divided among themselves according to the following criteria:

M.A. Tynybayeva – The research idea, formulation of the research goal and objectives, analysis of learning objectives and global competence indicators, participation in writing the "Conclusion" section and verification of the research findings, guidance and overall coordination of the research;

A.A. Akhmetzhanova – Data analysis, preparation of sections related to results and discussion, formulation of recommendations for integrating global competencies into educational programs;

A.K. Torebekova – Data collection, mapping of the subject programme content, preparation of the theoretical part including the literature review and methodology, preparation of the section of the article related to the practical outcomes of the mapping process.

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Оқу бағдарламасы мен тұрақты дамуды біріктіру: жаһандық құзыреттерді қалыптастырудың карталау әдісі

Аңдатпа. Мақалада Bloomberg Philanthropies бастамасымен Global Cities, Inc. бағдарламасы аясында әзірленген 55 индикаторды қолдану арқылы 4-сыныпқа арналған «Дүниетану» пәнінің оқу бағдарламасының мазмұнын карталау қарастырылады. Аталған индикаторлар білім беру мазмұнын және функционалдық сауаттылықты, соның ішінде жаһандық құзыреттерді сапалық бағалау өлшемдері ретінде қызмет етеді. Зерттеудің мақсаты – жаһандық құзыреттерді дамыту арқылы тұрақты даму мақсаттарына сәйкес білім беруді бағалау жүйесіне интеграциялау үдерісін талдау. Зерттеу барысында жаһандық құзыреттердің оқушылардың жаһандық мәселелерді шешуге қажетті білімдері мен дағдыларын қалыптастырудағы әсері бағаланып, сондай-ақ білім беру тәжірибесі мен бағалау жүйесіндегі қолданыстағы тәсілдер талданды, оларды тұрақты даму мақсаттарына қол жеткізу тетіктерін жетілдіру үшін жақсарту жолдары ұсынылды. Зерттеу нәтижелері карталау және оқу бағдарламасын талдау арқылы анықталған 55 индикатордың 78%-ы (43 индикатор) жаһандық құзыреттердің индикаторларымен сәйкес

келетінін көрсетті. Бұл жаһандық құзыреттерді жанама түрде интеграциялау тиімді құрал екенін және оны толыққанды жүзеге асыру үшін мұғалімдердің тиісті кәсіби даярлығы қажет екенін растайды.

Түйін сөздер: жаһандық құзыреттілік, карталау әдісі, оқу бағдарламасы, функционалдық сауаттылық, мұғалімдерді даярлау, бағалау.

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**Интеграция учебной программы и устойчивого развития:
метод картирования для формирования глобальных компетенций**

Аннотация. В статье представлен анализ содержания учебной программы предмета «Познание мира» для 4-го класса с применением метода картирования, основанного на 55 индикаторах, разработанных в рамках программы Global Cities, Inc., инициированной Bloomberg Philanthropies. Данные индикаторы выступают в роли качественных критериев для оценки содержания программы и уровня функциональной грамотности обучающихся, включая развитие глобальных компетенций. Основная цель исследования заключается в изучении интеграции образования для устойчивого развития в систему оценивания через внедрение глобальных компетенций. Исследование направлено на оценку влияния этих компетенций на формирование знаний и навыков, необходимых обучающимся для решения глобальных проблем, а также на анализ текущих подходов к образовательной практике и системе оценивания с целью их совершенствования в соответствии с современными требованиями. Результаты показали, что 78% индикаторов (43 из 55), выявленных с помощью метода картирования, согласуются с индикаторами глобальных компетенций. Это подтверждает, что косвенная интеграция глобальных компетенций является действенным инструментом, который при условии надлежащей подготовки педагогов может обеспечить эффективное внедрение в образовательный процесс, способствуя достижению целей устойчивого развития.

Ключевые слова: глобальные компетенции, картирование, учебная программа, функциональная грамотность, подготовка учителей, оценивание.

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