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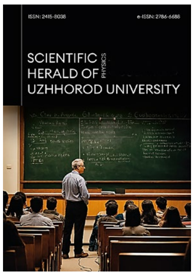

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Ethnomathematical problems in the context of the ethnocultural content of mathematical education

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Abstract

Relevance. The relevance of this study lies in the fact that modelling the content of ethnomathematical problems determines the range of mathematical competencies and skills, including mathematical reasoning and problem-solving, the cycle of which comprises the corresponding ethnocultural processes. Modelling measures how effectively the state prepares students to use mathematics in all aspects of their personal, civic, and professional life so that they become rational, committed, and thinking members of modern society.

Purpose. The purpose of this study is to investigate the modelling of ethnomathematical problems necessary for the successful establishment and development of mathematical competencies of students in grades 5–6.

Methodology. These problems include the use of concepts, properties, procedures, and tools to describe, explain, and predict phenomena, which, in turn, help to draw informed conclusions and make informed decisions.

Results. The role of ethnomathematical problems in a rapidly changing world driven by new technology and trends, where students in grades 5–6 are creative and actively involved in learning, can be of great importance and enable the children to make non-standard decisions on behalf of themselves or the society they live in. This puts at the forefront the capacity for mathematical thinking, which has always been part of the development of teaching competencies. Modern technological advances also require students to understand the concepts of computational thinking that are part of mathematical skills. The ability of modelling allows enables logical reasoning, as well as allows honestly and

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convincingly presenting arguments, which are becoming an increasingly important structure of ethnocultural practice in the modern world.

Conclusions. The practical significance lies in the definition of mathematical means of folk pedagogy, which allows developing a methodology and technology of teaching to structure and model the content of ethnomathematical tasks.

Keywords: modelling; students; ethnomathematical tasks; mathematical competencies; skills; ethnocultural content.

Introduction

Mathematics is the science of well-defined objects and concepts that can be analysed and transformed in various ways, using ethnomathematical tools to come to definite and timeless conclusions. During the learning period, students discover that with the right reasoning and assumptions, they can achieve results that are completely plausible in a wide range of real-life contexts, where it is essential that these conclusions are objective and do not require approval by any external authority. Mathematics is often considered a universal subject. However, it turns out that this universality has cultural limitations. It is universal that in every society there are counting systems, measures, and ways of determining positions in space [1]. Cultural differences relate to the ways of solving problems, their writing, and contextualisation, which are designed to affect the study of mathematics in classrooms, where they can be an obstacle to the cognitive process. Ethnomathematics is a branch of science that investigates interrelation of mathematics and culture, which deals with the analysis of competencies from a cultural perspective. Such a problem may be faced, for example, by students at school who came from other cultures and who had problems solving mathematical problems. Each student comes to school with their own baggage of ethnomathematical skills and competencies. Intensive migrations, in which students from different cultures study, force them to look for effective mathematical methods in this context [2].

The process of learning mathematics is extremely complex and difficult. Modelling the content of ethnomathematical tasks should be embedded in the particular reality of the educational system, since the cultural perspective in the classroom emphasises the need for contextualisation and the use of mathematical reflection for the establishment and development of mathematical competencies. Such tasks are confirmed by non-encyclopaedic knowledge and intellectual efficiency, which form various competencies of understanding mathematical text and clearly expressed personal thoughts [3]. The process of developing models of ethnomathematical problems is associated with the daily interaction of a person with the mathematical world. Still, the most critical issue lies in the selection of content at this stage, which provides students of grades 5–6 with the opportunity to develop competencies and continuous learning. Information technology makes new research ever necessary in the field of ethno-cultural mathematics and the analysis of various concepts to find the optimal solution in terms of programme strategies and concepts. There are research topics in anthropology that do not require special explanations. Studies of customs and material culture are a constant repertoire of culturology researchers, when it is possible to focus on a relatively isolated and homogeneous group of students living in a strictly defined territory. Their properties have so far been investigated by mathematics, trying to scale them on the verge of mathematical reflection [4; 5].

Content modelling is rarely discussed in schools. Meanwhile, all over the world in various centres engaged in research on didactics in teaching mathematics, researchers and teachers are trying in various ways to connect school mathematics with the surrounding reality and show how simple ethno-cultural elements of mathematics can be used to study the world around them. Description of the phenomenon of modelling ethnomathematical problems and their application for the establishment and development of mathematical competencies in students of grades 5–6 requires analysis of many influencing factors of its creation and functioning. This process comprises several stages. The initial analysis and construction of an ethnocultural mathematical model consists of examining a certain situation and determining which types of data variables exist. At this stage, it is necessary to determine the entire mathematical apparatus that can be used in the corresponding situation. Mathematical analysis of the problem inclines to solving equations and problems by applying mathematical apparatus to evaluate the comparison of the results obtained with hypotheses and expectations. It is also possible to return to the beginning of the modelling process if the results obtained do not satisfy the ethnomathematical tasks. At different levels of competence development, students in grades 5–6 can use different tools to support mathematical modelling. Such can be computer software are available on almost every computer, and always available for use [6; 7].

The purpose of this study is to investigate the modelling of ethnomathematical problems necessary for the successful establishment and development of mathematical competencies of students in grades 5–6.

Materials and Methods

The methodological framework of this study comprised the following approaches to the investigation of this subject: pedagogical, cultural, methodological. Within the framework of its methodology, the pedagogical method integrates ethnomathematical tasks into the necessary aspects through subject correlations. The category that defines the concept has several possible aspects in the practice of school didactics, recreating knowledge partly known from publications on pedagogy, which are few, superficial, and isolated, rather as a substitute for the diversity of styles used to create joint mathematical and ethnocultural spaces together with students of grades 5–6. To explain the initial approach, it is important to investigate, understand, and purposefully apply national and folk models as an additional product of many years of experience in very diverse volumes and structures of mathematical problems that need supplementary materials that fall in line with the curricula. In the didactics of pedagogical methodology, the development of mathematical competencies of students, as well as their systematic promotion, should be a synthesis of ethnocultural knowledge and skills, that is, their integration through a profound understanding of modelling problems related to folk components.

The cultural approach implies ethnomathematical education as a substantially limited perception of this area of knowledge. Education in grades 5–6 is most often limited to arithmetic problems and ready-made rules of behaviour that allow solving certain problems. It is also a common way to study mathematics at school. The lower the educational level, the more socially fixed this vision is. The beliefs associated with this phenomenon provide students with mathematical education in the context of folk and cultural resources, which constitute an excellent source of individual mathematical meanings and strategies. The personal meanings of students formed based on previous teachings should recognise spontaneous observations and actions of a mathematical nature, as well as use them as a basis for the gradual formalisation of knowledge. However, at school, it often turns out that such competencies are frequently criticised by non-mathematical ways of solving ethnocultural problems. Meanwhile, it has been known for many years that they are often a source of mathematical achievements. They demonstrate, among other things, the substantial limitations in the development of mathematical thinking of students, and the effects of mathematical education conducted in such a way can be described by the phenomenon of an ethnomathematical competence system.

The methodological paradigm considers the profound influence of various models that cover the types of research that consider the use of thematic contexts that discuss the merits of using the available ethnomathematical data. It is necessary to consider the potential validity of the methodological approach, as well as the idea of an ethnomathematical analysis of tasks to develop the skills and competencies of students in grades 5–6. An equally important reason for the specific features of modelling the content of tasks may be the specifics of mathematics, unique among various fields of knowledge, which determine the relationship between mathematical and ethnocultural specific objects, rules or regulatory operations. The current method means more than just the type of data to be used — it is related to the general orientation and type of statements that are selected. Combinations of data may depend on the preferences and skills of students, as well as on the suitability of individual approaches to ethnomathematical tasks. Such data is especially useful when it is necessary to find out how widespread a particular cultural behaviour is in a particular model.

Results and Discussion

The process of modelling the content of ethnomathematical tasks is applied in the context of education, and is broadly interpreted as the acquisition of experience and knowledge by a student, the development of skills and a better understanding of the surrounding world and culture through the lens of mathematics. It covers both school educational and pedagogical processes, as well as any informal learning, and the accumulation of experience in everyday interactions. The establishment and development of mathematical competencies is sometimes defined and described differently relating to the educational process. The knowledge of a student of grades 5–6 arises as a result of their active actions that are constructed in their mind, and the acquisition of knowledge, in turn, is a process that occurs in interaction with the surrounding and ethnocultural environment. The establishment and development of mathematical competencies is not acquired immediately, it develops as mathematics develops, as well as with increasing knowledge and experience. This is a kind of general mathematical education, with its narrow segment related to ethnocultural functions. The elementary ethnomathematic structure of modelling is a set of knowledge, competencies, and skills that students of this stage of education should have. In culture, mathematics is created for an adult's everyday-life needs to introduce an effective ability to think mathematically [8]. The starting point is the concept of modelling, which refers to the ability to apply competencies, analyse, argue, and communicate productively in the process of stating, solving, and interpreting ethnomathematical problems in various situations.

Modelling the content of ethnomathematical tasks refers to the skills included in the mathematical competence. The starting point is the belief that the development of mathematics in ethnocultural and national aspects requires an increasingly better use of modelling by each student of grades 5–6 in various situations in everyday life. It is assumed that in adulthood, the skills acquired at school upon performing such tasks are transferred to professional activity. Students can activate their knowledge and mathematical skills when they are faced with the need to solve real problems that the world provides them with. This assumption puts the tasks into practical content that is not generally similar to ordinary school examples. Thus, the difficulty lies not in solving an abstract puzzle detached from life, but in using mathematical thinking, which is crucial for understanding the corresponding idea. The specifics of modelling the content of ethnomathematical problems lies in a process based on certain assumptions, logical laws, definitions, theorems, and at the same time in posing questions-hypotheses that cannot always be answered. This kind of folk pedagogy makes provision for the ability of students in grades 5–6 to recognise and understand the role of mathematics in the modern world, to make judgments based on logical and mathematical reasoning, as well as to use mathematical skills if a particular situation demands it.

The long history of the culture of mathematics in some way hinders students of grades 5–6 in choosing methods of transmitting mathematical modelling. Mathematics allows applying the principle of didactic parallelism, claiming that the student repeats the learning process of humanity [9-11]. Thus, knowledge of the history of mathematics is an essential element of mathematical education that students of educational institutions should have. The scope of this knowledge should be determined by the main facts from the history of individual mathematical and ethnic components. Modelling the content of ethnomathematical problems also implies the need to familiarise students with the mathematical culture, aspirations, and methods of work of modern content. The connection between knowledge of particular facts and their understanding leads to informed intentions of activity that goes beyond the simple ability to explain mathematical details. It is also vital to familiarise students with modern research and achievements, since the current structure of ethnomathematics is a vast, powerful, and complex task that goes far beyond the development of mathematical competencies. Modelling, as an organised set of concepts and ideas, is the most universal way to develop mathematical competencies of students in grades 5–6. To reduce mathematics to a simple calculation is to distort it. In the way of thinking that it can provide, there is a rational tension that sublimates into a socio-cultural resource for the school and humanity in general.

Expanding the scope of the modelling concept by abstracting some properties of problems and generalising the results for broader classes of subjects allows distinguishing between different types of mathematical propositions, including implicative statements, sentences with quantifiers, assumptions, definitions, theorems, hypotheses, and special cases within the framework of ethnocultural constraints. The necessary factors for the effective development of mathematical competencies in the context of ethnocultural tasks of students in grades 5–6 are as follows: the ability to use the processes used in mathematical research; control of mental and emotional states and the ability to use them; understanding of the corresponding field of mathematics and, if necessary, also the field in which it is applied. Each task is described using certain parameters. The first is the ethnomathematical content that is needed to solve a given problem. Next are space and form — geometric situations, spatial relations between objects; changes and relations are functional relationships represented by symbolic, algebraic, tabular, or graphical components; calculations, including understanding the meaning of calculations performed, evaluation, and approximation of numerical quantities, reference to real numbers surrounding the world; uncertainty — random phenomena, statistical, and probabilistic considerations [12; 13].

First, it is important to analyse the achievements of schoolchildren, paying special attention to creative and analytical ways of thinking, as well as the nature of the application of ethnomathematical knowledge of students. With this approach, there are no differences between curricula, but cultural and ethnic conditions can play an important role. Content modelling is driven by mathematical skills that need to be activated to link an ethnic problem with mathematics and find the right solution. The competencies used in tasks require the application of mastered skills of operating well-known and simple objects. The student needs to choose mathematical concepts suitable for solving a particular problem. Creative approach to the problem, original mathematisation, reasoning, and model creation often comprise generalisations, usually requiring explanations or reasoned solutions. The decisive role here is played by a combination of factors culturally, historically and sociologically determined, as well as various organisational decisions regarding education. Mathematical language is undoubtedly an essential component of ethnomathematical culture. This term is understood very broadly as an element of communication between mathematics and the meaning of symbolism [14; 15]. However, as mathematical maturity intensifies, the situation changes. Mathematical national experience is no less important for mathematical problems, since it is necessary to stimulate the imagination and mobilise students to further search for content modelling.

Thanks to the functions of mathematical modelling of tasks, the development of competencies among schoolchildren of grades 5–6 achieves efficiency in terms of the cultural language of mathematics upon using symbols, terms, and expressions peculiar to real ease of understanding, as well as interpretation of particular mathematical records. A visible sign of such a situation would be the correct expression of ethnomathematical thoughts and attempts to mathematise the cultural environment. This refers not to artificial linking of mathematical terms with surrounding objects, but to the conscious use of mathematical content wherever it interferes with reality. The only way to understand the process of simulating such tasks is to trace different approaches to this problem, compare, and analyse them. The student will reach a satisfactory degree of competence and maturity from the standpoint of mathematics when they will not be content with solving any problem and consciously strive to create the most appropriate reasoning [16; 17]. However, this situation is not entirely practical because, as a result, teachers cannot demonstrate students the expediency of finding different solutions. A necessary condition in this case is the desire to overcome cultural and ethnic difficulties, to achieve the appropriate abilities, assessing the essence of mathematical solutions. Consequently, they can bring great satisfaction with the results achieved, which can compensate for the efforts spent on solving the ethnomathematical problem.

The ethnomathematical content in the tasks is determined by the research programme on the history and philosophy of mathematics, which have pedagogical consequences, focusing on methods and types of explanations, understandings and overcoming of various socio-cultural environments [18; 19]. That is, it acts as a form of mathematical image inherent in different cultures, and the unity of mathematics coexists with its anthropological variants. For example, when students collided with other cultures, the available knowledge of indigenous peoples was selectively appropriated, but at the same time they were ignored, rejected, denied, and even suppressed as integral systems of peoples' knowledge. Nevertheless, these peoples had peculiar cognitive systems that included various spatial-temporal concepts and different ways of observation, classification, ordering, comparison, measurement, quantification, inference, invention. Hence, the need to reinterpret the discipline from a socio-cultural standpoint. It is essential to appeal to the responsibility of teachers so that they relate their discipline to the basic needs of the world's population, concerning, among other things, politics, economics, well-being, relations between nations and social classes. Unfortunately, mathematics was no stranger to the destructive impulses that marked the history of humankind. However, it is in the ethnomathematical tasks that lies the possibility of getting rid of barbarism, which still exists in modern reality.

The teacher can use an ethnomathematical approach in the tasks to present a historical and cultural context for the introduction of mathematical concepts or ideas on various topics to provide incentives for reflection on the meaning of mathematics, culture, and diversity. An ethnomathematical approach to the discipline together with the use of a methodology that makes provision for the active involvement of students through group work focused on research and discovery, which helps make the activities interesting and effective. Since mathematical education plays a fundamental role in personal growth, it accompanies students for many years, giving them the knowledge and skills necessary to create appropriate competencies [20-22]. The secondary school provides cultural and methodological tools for an in-depth understanding of reality to establish the correct modelling for problems in accordance with personal abilities and preferences sufficient to continue studying at a higher level. It is crucial to stimulate students' curiosity in such a way so that they learn to ask themselves questions and have the tools to find answers unassisted. These activities develop mathematical practices: everyday or cultural activities based on cultural ideas or mathematical procedures. The way mathematical modelling is applied and developed depends on the way reality is observed.

Cultural mathematical dynamism determines the development of students' knowledge and ways of thinking, which are connected by cultural, linguistic, social, political, economic, ideological, and religious factors. Modelling the content of ethnomathematical problems seeks processes and activities where knowledge of mathematics appears and explores the causes that lead to various changes relating to natural, cultural, and social models. In many cultures, the concept of mathematics is not a separate structure, but is integrated into other spheres, such as religious, political, and social. It resembles a way to improve the local culture, overcoming the imposition of the dominant culture. Explaining mathematics using ethnomathematical problems makes the discipline more accessible to different groups of the population, an example is Latin America, where students of European and African descent coexist. Furthermore, the study of conventional practices may interest students who are not attracted to formal mathematics, which will contribute to the development of mathematical competencies. The ethnic content of the tasks may be conditioned upon the combination of the culture of the population and academic knowledge. One of the ways of such activity can be the observation of the practice of a certain cultural group or structure behind mathematical actions. These measurements emphasise cognitive processes for use in the classroom, which describe the correlation between ethnomathematical tasks and didactics of mathematics, which, in turn, allow students to create and change conventional motives [23; 24].

To model the content of ethnomathematical problems means to consider mathematics taking into account different cultural environments. The current classroom approach may include, for instance, using local tools to introduce mathematical concepts or to find connections between the subjects involved and the environment, society, or culture, the idea of which is to look for mathematical components in literature, art, or cinema. It emphasises the process of mathematisation of reality, which is controlled by different cultural groups and thus allows understanding how mathematical practices and ideas are present in many situations, describing the development of art and technology of different cultures and languages [25; 26]. In fact, some cultures have developed their original numbering system, geometric shapes, and different ways of thinking based on observing the environment and their habits. The presentation of historical elements with reference to their cultural context offers the possibility of organic intensification and encourages fundamental reflections on the genesis of the concept and the isolated development of mathematics, which appears problematic from an epistemological standpoint.

Ethnomathematical ways of seeing and thinking are based on social aspects within the framework of teaching mathematics. They have to find thematic spaces that seem secondary and form the basis of mathematical competencies. The particular interest of content modelling is specific to the teaching of mathematics, which is associated with abstract and cultural actions during learning. Its development is not only technical and formal progress, but on the contrary, the result of a constant revision of the meaning of culture and mathematics in general [27-29]. A linguistic tool that helps avoid misunderstandings, gives uniqueness to the meaning of the problem. The development of ethnomathematics goes in different vectors, but it cannot be denied that it is predominantly aimed at creating concepts that consider the nature of ethnic concepts and mathematical objects. Admittedly, apart from professional mathematics, which produces theorems and theories in this field, in a general epistemological sense, a student who is engaged in mathematics and its development must necessarily pose an epistemological problem as a cultural fact, and a mathematics teacher is an expert who offers students to build and develop mathematical skills and competencies. Ethnic components belong to groups much larger than simply identifiable cultural associations, such as national and tribal age groups, which include cultural memory, codes, symbols, and even particular ways of reasoning and conclusions [30-32].

Ethnomathematical problems are in the area of transition between cultural anthropology and mathematics, starting from the moment of the history of mathematics and social mathematical policy, acquiring a new and broader dimension that must be assimilated into the school system. Certain considerations concerning the differences in the impact of mathematics on groups of different racial origins and social classes can be reflected at the level of implementation, relations, and interpretation in the use of mathematical problems. Some of them are related to the natural inconsistency of race or gender, other explanations point to social structures that they deliberately target in some cultural and ethnic groups of mathematical education. The popular position prevailing throughout the school system seeks to give everyone the same mathematics, assuming that everyone is capable of equally assimilating this particular form of knowledge, which appears right for the appropriate level of knowledge of modelling dynamics. Such knowledge and competencies in the case of mathematics fit perfectly into the mental structure that has already projected mathematics, which is reflected in education in general. However, new approaches to the nature of mathematical knowledge and the growing attention paid to ethnomathematics open up a new broad field of research into what can be called an anthropological approach to mathematics, rethinking the constructions of cultural and psycho-emotional characters [33; 34].

A new look at modelling the content of ethnomathematical problems to develop and apply the competencies of students in grades 5–6 is based on cultural and psycho-emotional motives that have an impact on groups with greater or lesser effectiveness in certain types of mathematics. In this context of a systemic problem, the student is exposed to contents that are distinctive due to race, social class, or gender. The same thing happens with cultural tasks, some aspects of which run closely between religious and racial roots in education. Thus, these differences are related to socio-cultural learning, which are associated with genotypic influence, as regards the transition from ethnomathematics to mathematics. They can be considered as a transition from oral to written language, where the written language is based on the knowledge of the oral expression that the student already possesses. Understanding and respecting the practice of ethnomathematical tasks opens up a massive potential for recognising certain parameters and for feeling ethnic balance. The moment of a cultural meeting has a very complex dynamic, and this meeting takes place between groups among students. Education during the transition period cannot be aimed at simply transmitting outdated content, mostly uninteresting and useless. Modelling and analysis tools should function in a multicultural and technological society capable of developing mathematical competencies [35-37].

Modelling the content of ethnomathematical tasks has proven itself in all fields of knowledge and in all actions of the modern world. Its presence in the future will form an integral part of the tools for applying school competencies. The communicative, analytical, and material components of the dynamic assimilation of mathematics are integrated into the knowledge and actions of the future, but to achieve these goals, it is important for the teacher to be prepared according to new ethnomathematical alternative ideas [38; 39]. The pedagogical proposal of folk mathematics makes provision for turning mathematics into an active engine, working with real situations over the course of the current time. The history of mathematics is influenced by the prejudices of history and science, which for centuries denied the existence of independent developments. The way people understand themselves and others is shaped by history, which they assimilate not only at school, but also through films, newspapers, and TV programmes. When views expand and differences of opinions appear, modelling becomes an important reference point in understanding the clash of cultures and ideas in a mathematical prism. Cultural dependencies determine the dominant role in world events that lead to thinking about numbers and problems, which is emphasised with great clarity by fundamental mathematical assumptions.

Modern content modelling of ethnomathematical problems has transformed into a universal language that allows students to maintain the competence of the logical structure of mathematical education. It contains a set of elements that establish a series of methodologies aimed at achieving skills about the physical world, and also represent an intellectual activity that requires intuition and imagination to draw conclusions. Most of the mathematical problems that have a profound impact on later ethnocultural components represent the tools of material life on which the historical outline of the territory is based. At the school level, much attention is paid to measurement, starting with units such as anthropometric, which are closer to the student, moving on to objects from general mathematical use to conventional units. To acquaint students of grades 5–6 with the stated facts is a necessity for a good understanding of the essence of the ethnocultural and national content of mathematical problems, its role and significance in mathematics for the development of mathematical competence and the appropriate environment for the functioning of the current process. Composite modelling mechanisms are considered marginally, since they constitute an important element in determining school competencies aimed at good preparation of students [40].

Conclusions

Thus, modelling the content of ethnomathematical problems requires new curricula that would consider not only the epistemological aspects of mathematics, but also various cultural aspects of students. Changes in the curriculum should be determined by the goals, content, and methods closely related to the acquisition of mathematical competencies in the light of the modern world. Unlike other individual disciplines, ethnomathematics is described by strong moral and civic obligations, not to mention its specifics, which opens up to the world, supporting positive correlations that permeate it. Pedagogical studies that question the maturity of mathematical concepts in various cultural contexts establish a dialogue between conventional mathematics and forms of activity more related to students. It also implies contemplating the reasons why mathematics has separated from the main ethnic and cultural fields over time. It is important to consider modelling for the development of mathematical competencies of students in grades 5–6 as a starting point for the contextualisation of mathematics in its various cultural aspects. The modelling process is integrated considering the way students in grades 5–6 understand, formulate, process, and use ideas, concepts, procedures, and practices of mathematics to solve problems relating to everyday activities.

Realisation of the role of mathematics in culture enables the improvement of the student's ability to create a connection with interdisciplinary mathematics and reality. Teaching mathematics through a detailed description of cultural values helps students learn about reality, culture, and the environment through a mathematical prism. Students are ready to acquire mathematical competencies in a multicultural world, recognising the contribution of each population group to the development of mathematical knowledge. Thus, the requirements of national guidelines and programmes regarding interdisciplinary connections and relations between mathematics are met. The development of lessons using this approach helps understand the logic and depth of certain mathematical ideas, and the study of methodologies and representations of other groups of the population can become an incentive for independent reflection. Ethnomathematical modelling of the content of tasks wants to strengthen the creative abilities of students and their respect for their culture in a vision where multiculturalism lives, acting as a fundamental wealth for the development of humankind. Ethnic content in the context of mathematical problems is considered to be a broad term relating to the cultural aspect, including consideration of arguments such as language and symbols.

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Conflict of Interest
None.

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Етноматематичні проблеми в контексті етнокультурного змісту математичної освіти

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Анотація

Актуальність. Актуальність даного дослідження полягає в тому, що моделювання змісту етноматематичних задач визначає коло математичних компетенцій і навичок, зокрема математичного мислення та розв'язування задач, цикл яких охоплює відповідні етнокультурні процеси. Моделювання вимірює, наскільки ефективно держава готує учнів до використання математики в усіх аспектах їхнього особистого, громадянського та професійного життя, щоб вони стали раціональними, відданими та мислячими членами сучасного суспільства.

Мета. Метою цього дослідження є вивчення моделювання етноматематичних задач, необхідних для успішного формування та розвитку математичних компетентностей учнів 5-6 класів.

Методологія. Ці задачі передбачають використання понять, властивостей, процедур та інструментів для опису, пояснення та прогнозування явищ, які, в свою чергу, допомагають робити обґрунтовані висновки та приймати виважені рішення.

Результати. Роль етноматематичних задач у світі, що швидко змінюється під впливом нових технологій і тенденцій, де учні 5-6 класів творчо мислять і активно залучені до навчання, може мати велике значення і давати можливість дітям приймати нестандартні рішення від імені себе або суспільства, в якому вони живуть. Це висуває на перший план здатність до математичного мислення, яка завжди була частиною розвитку педагогічних компетенцій. Сучасний технологічний прогрес також вимагає від учнів розуміння концепцій обчислювального мислення, які є частиною математичних навичок. Здатність до моделювання уможливлює логічне міркування, а також дозволяє чесно і переконливо представляти аргументи, які стають все більш важливою структурою етнокультурної практики в сучасному світі.

Висновки. Практичне значення полягає у визначенні математичних засобів народної педагогіки, що дозволяє розробити методику і технологію навчання структуруванню та моделюванню змісту етноматематичних задач.

Ключові слова: моделювання; учні; етноматематичні задачі; математичні компетентності; уміння; етнокультурний зміст.