

РОЗДІЛ 1. АКТУАЛЬНІ ПИТАННЯ ПІДВИЩЕННЯ ЯКОСТІ НАВЧАННЯ
ДИСЦИПЛІН ПРИРОДНИЧО-МАТЕМАТИЧНОГО ЦИКЛУ
В ШКОЛІ ТА ЗАКЛАДАХ ВИЩОЇ ОСВІТИ
РІЗНИХ РІВНІВ АКРЕДИТАЦІЇ

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METHODS OF FORMING STUDENTS'
ENTREPRENEURIAL CULTURE AT PHYSICS LESSONS

The article summarizes scientific works on the formation of entrepreneurial culture. Based on the terminological analysis of the key concepts ("culture", "entrepreneurial culture", "entrepreneurship"), the essence and clarification of the concept of "entrepreneurial culture of students" are revealed. Attention is focused on the importance of forming an entrepreneurial culture among young people in our time. The problems of forming the entrepreneurial culture of primary school students are identified and proposals for their elimination are developed. The model of formation of students' entrepreneurial culture is described, consisting of blocks: target, theoretical and methodological, content, procedural and effective blocks.

Attention is focused on highlighting the potential of scientific approaches and principles to the formation of students' entrepreneurial culture. Special attention is given to the expediency of applying axiological, acmeological, problem-based, system-activity, competence-based, integration, personality-oriented approaches as an important methodological basis for the formation of entrepreneurial culture of students at physics lessons. A set of pedagogical conditions that affect the formation of entrepreneurial culture of students at physics lessons is defined. The following components are identified in the structure of students' entrepreneurial culture: axiological, theoretical, technological, and creative. It is proposed to use methods and forms of work for the formation of entrepreneurial culture of primary school students

The criteria for the formation of entrepreneurial culture at physics lessons are determined, namely motivational-value, cognitive, practical and creative. It is established that the issue of forming an entrepreneurial culture of students at physics lessons remains insufficiently developed in pedagogical theory and practice. Prospects for further scientific research are indicated.

Keywords: *entrepreneurial culture, formation of students' entrepreneurial culture, physics lessons, model of entrepreneurial culture.*

Problem statement. In the modern world technologies, the geopolitical situation and the global economic space as a whole are changing very quickly. Lifelong learning and improving practical skills are becoming central to the struggle for employment and social integration of people. The approach of young people to job search is also changing. Thus, the education system needs to be modernized and, if necessary, replaced by an up-to-date efficient model – in case the current one no longer meets new social or labor needs in the professional or personal sphere. The new scenario, due to the profound changes taking place in the economy and society, emphasizes and puts in the first place the formation of an entrepreneurial culture of students, which acts as the basis for the economic and social development of the country.

Entrepreneurial culture contributes to the formation of students' skills and abilities necessary for conscious choice of further life path and self-realization in life. However, domestic entrepreneurial education does not meet the modern needs of society, as evidenced by the decrease in entrepreneurial activity of Ukrainians. Therefore, the definition of the features of the

formation of entrepreneurial culture, which is a system of knowledge, values, moral and ethical norms, techniques and methods of carrying out economic activities, is now relevant. Since topics related to economics and entrepreneurship are already ingrained in the school curriculum, in this article we consider in depth the entrepreneurial culture of primary school students at physics lessons as the formation of a certain life position and willingness to act among students.

Analysis of recent research and publications. Defining a culture has always been a challenge, because the meaning is multifaceted. Its definition can be approached from different angles, considered in different aspects: economic, philosophical, socio-political, psychological, pedagogical, and so on. Analyzing the literature, we draw up a number of definitions that have different views on the interpretation of culture:

Culture – (Latin cultura-cultivation, upbringing, education, development, honoring) a historically defined level of development of society, creative forces and abilities of a person, expressed in the types and forms of organizing people's lives and activities, as well as in their creation of material and spiritual values.

According to sociologist G. Hofsted, "culture is a collective mental programming, a worldview shared with other representatives of the corresponding nation, region, group, which distinguishes us from others and allows us to talk about mental and cultural differences." [1, p. 19]

The writer O. Brownson defined culture as a set of "properties, values, beliefs and behaviors that can be learned and acquired by a person from one generation to another, from one person to another, from one group to another." [2]

To this day, there is no precise and unambiguous definition of the concept of "entrepreneurial culture" in the scientific literature. Understanding the concept of entrepreneurial culture requires clarification.

The definition of the essence and main components of entrepreneurial culture is the subject of research by many foreign authors, among whom it is worth noting P. Drucker, J. Schumpeter, R. Lewis, R. Ruttinger, V. Makeeva, G. Tulchinsky, A. Alekseev, A. Butorin, Y. Fukalov, Y. Nanakin and others.

Psychological and pedagogical foundations of entrepreneurial training are studied in the works of Z. Hipters, I. Demura, N. Pobirchenko, O. Romanovsky, V. Shabanova, V. Andrianova, Y. Pachkovsky and others.

The problem under study is also in the focus of such native researchers: O. Romanovsky, V. Maikovskaya, I. Dobryansky, Y. Belova, I. Zimnaya, O. Kobernik, V. Kraevsky, O. Liskovich.

In the dictionary of the Ukrainian language, the term "entrepreneurial culture" is interpreted as "...a certain social culture, within which such qualities as individual initiative, energy and self-confidence are especially valued" [3, p. 1453]

The development of personal qualities of an entrepreneur, in particular, the formation of entrepreneurial competence, is considered in the works of N. Akaev, N. Pobirchenko, Y. Belov, G. Matukov, A. Protsenko and others.

M. Pichkur considers entrepreneurial culture as an integrative ability to enthusiastically create innovative design projects confidently and businesslike accomplish them with maximum socio-economic benefits. [4, p. 105]

A. Veritov considers entrepreneurial culture as a system of knowledge, values, moral and ethical norms, techniques and methods of carrying out economic activity.

I. Zenkova believes that "entrepreneurial culture is characterized by a measure and is the result of the formation of socially significant integrative entrepreneurial qualities, genetically determined and socially acquired as a result of the functioning of the mechanism of internal value-semantic regulation of entrepreneurial behavior and external entrepreneurial relations of a person in the process of his life and personal self-realization."

From the above mentioned definitions, it follows that entrepreneurial culture is the result of socialization and education. Numerous scientific studies of local and foreign researchers prove the expediency of forming an entrepreneurial culture in the main school in modern socio-economic conditions. Our study looked at entrepreneurial culture from a slightly different perspective. We believe that the school has the opportunity to form the entrepreneurial culture of students during

physics lessons, without putting forward the topic of entrepreneurship as a postulate in the work. [5] We do not see entrepreneurial culture as a means of creating new businesses, but rather as a common attitude and valuable asset in each individual throughout life, given the scope of characteristics that define it.

We agree with the opinion of R. H. Brockhaus, who believes that entrepreneurship education is designed to teach skills, not produce real entrepreneurs. [6, p. 2] Generating global experience, we note that the formulation of goals, motivation for efforts and analysis of results are typical entrepreneurial qualities of a person that can be taught in school.

The purpose of the article is scientific and theoretical substantiation of the model of formation of entrepreneurial culture of primary school students at physics lessons

Presentation of the main material. In the XXI century, the Ukrainian education system is undergoing significant changes in the context of the new laws of Ukraine "On education", "On comprehensive secondary education", and the concept of "new Ukrainian school". The goal of the new Ukrainian school is clear and concise - to release from school a fully developed, capable of critical thinking integral person, a patriot with an active position, an innovator who can change the world around him and learn throughout life.

Without cultural knowledge, it is impossible to talk about a civilized person, society, the progress of the individual's future is unimaginable. Entrepreneurial culture helps the individual in solving the tasks assigned to him, gives him the opportunity to actively participate in the further political and cultural development of society, and also allows the individual to be constantly in demand in the labor market. The foundation for the formation of students' entrepreneurial culture is to promote the development of entrepreneurship. Entrepreneurship is a life mindset characterized by creative and innovative thinking, the need for achievement, and smart management. Entrepreneurship, which manifests itself in all areas, indicates the ability of a person to bring ideas to life. This requires creativity, innovative thinking, and risk-taking, as well as the ability to recognize opportunities, plan your actions, and implement planned activities.

An enterprising person can cope with the task independently and is able to change society. We consider it appropriate to form the entrepreneurial culture of students in secondary schools (grades 7-9). In our opinion, a student in adolescence is a bold initiator who knows how to find new solutions, has high motivation, is able to work in a team, set goals and achieve results, and also has the ability to introspect. It is on the secondary school stage that the main attention in the educational process is paid to the formation of responsible members of society from students who independently cope with everyday life and can choose the path of learning that corresponds to their interests and abilities.

So, the entrepreneurial culture of students is defined by us as a set of attitudes and personality traits that contribute to increasing the initiative of participation in projects aimed at promoting and developing such values as independence, responsibility, initiative, empowerment, creativity and initiative.

Based on the conducted research, we consider it appropriate to propose a model for the formation of entrepreneurial culture of Primary School students at physics lessons. The need to develop this model is dictated by the requirements of the time, in light of the growing importance of the formation of students' entrepreneurial culture, so that they can consciously face their future studies and professional choices.

We proceeded from the fact that the formation of entrepreneurial culture in physics lessons is considered as a single and integral new educational result, which concerns not only the content, but also organizational forms, methods and means of teaching, as well as the assessment of student's achievements. This reveals one of the main principles of didactics – the unity of the procedural and semantic aspects of learning. The leading idea of the experimental model is determined that teaching physics will contribute to the formation of an entrepreneurial culture of students and ensure the acquisition of a set of practical skills (creatively solve problems and make decisions, assess risks, design, formulate their own judgment, defend their own position, overcome difficulties and obstacles on the way to the goal, be able to work with people).

The key hypothesis is that the model of forming entrepreneurial culture in the course of physics training will be effective in the conditions of: development and implementation of lessons with an entrepreneurial background for the main school (grades 7-9), the implementation of which provides an opportunity to combine the theoretical knowledge acquired by students on a specific issue or curriculum in physics with their practical application. The main problems in creating the experimental model were: finding out technologies for the formation of students' entrepreneurial culture among modern educational models, working out and systematizing the working categorical apparatus, analyzing the influence of technologies on the components of entrepreneurial culture, optimizing selected methods and effective techniques.

Schematically, the model is presented in this form (Fig.1).

The structural and logical construction of the model of formation of entrepreneurial culture of students consists of the following Units: target (purpose and tasks), theoretical and methodological (scientific approaches, pedagogical principles, components), content (normative documents, content of educational material in physics, interactive complex of educational and methodological support), procedural (organization of training, teaching methods, forms, educational technologies, management of learning, control, correction) and result (levels of formation) Units. Each unit, while remaining an element of integrity, has its own content and functional originality.

The defined purpose and tasks are integrated into the target unit. Achieving the purpose of forming an entrepreneurial culture at physics lessons for school students is possible if a number of tasks are performed, namely: 1) the formation of motivation to study the subject of physics; 2) the formation of a set of knowledge during lessons with an entrepreneurial background; 3) the formation of entrepreneurial skills and abilities; 4) the formation of personal and reflexive settings. [7, p. 111]

The theoretical and methodological unit for the formation of students' entrepreneurial culture is formed by methodological approaches, pedagogical principles and components of entrepreneurial culture. Accordingly, for the implementation of the experimental methodology, it is important to follow a number of approaches. Numerous scientific studies of domestic and foreign researchers prove the expediency of applying system-activity, acmeological, axiological, personality-oriented approaches, competence-based, problem-based and integration in the educational environment.

The organization of the process of forming the entrepreneurial culture of primary school students at physics lessons is based on a system of general didactic and specific principles. We have identified the principles of unity of educational, developmental and educational functions of learning; scientific character; systematic character and consistency; strength of knowledge; accessibility; activity, consciousness and independence; visibility; connection of learning with real life; individualization of learning. Among the specific principles: the focus of the process on the formation of students' components of entrepreneurial competence; unity and interrelation of theoretical, practical and entrepreneurial training. The interrelation and complementarity of certain approaches and pedagogical principles should provide a solid theoretical and methodological basis for the successful implementation of the process of forming an entrepreneurial culture among students.

When determining the structure of students' entrepreneurial culture, four components are important: axiological, theoretical, technological, and creative.

The content unit includes:

- normative documents, content of educational material in physics, interactive complex of educational and methodological support (programs, textbooks, methodological recommendations, development of non –standard lessons with an entrepreneurial background, trainings, etc.);

The procedural unit combines the organization of training, forms and methods of educational activities, educational technologies, management of learning, control and correction. The following effective technologies were fundamental for our research: problem-based learning technology, interactive learning technology, project technologies, developmental learning technology, information and communication technology, and blended learning technology.

Methods and technologies of teaching used at physics lessons with an entrepreneurial background should correspond to the activity part of entrepreneurial competence, that is, allow the acquisition of experience in handling physical knowledge, their appropriate application.

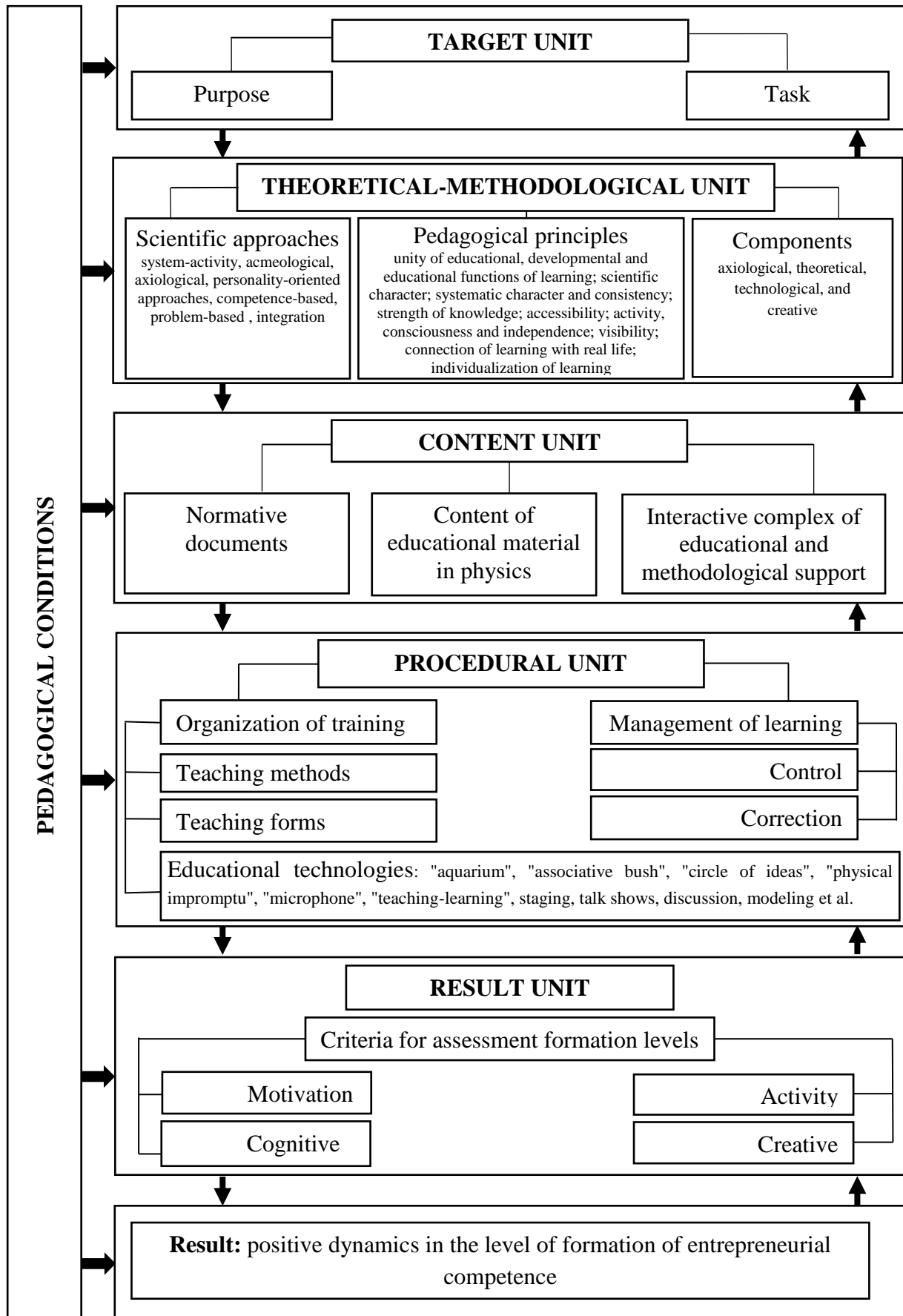


Fig. 1. The model of formation of entrepreneurial culture of students

As a result, the probability of identifying and developing entrepreneurial traits necessary for effective operation increases. At the same time, we give preference to methods that ensure self-development, self-actualization of the student and allow students to look for and realize exactly those ways to solve life situations that are suitable for them. These methods should form a set of axiological preferences, including the cognitive and emotional-value aspect of relationships to each other, to their activities (including cognitive ones), and responsibility for their actions. The developed model organically combines problem-based, interactive, role-playing forms and teaching methods ("aquarium", "associative bush", "circle of ideas", "physical impromptu", "microphone", "teaching-learning", staging, talk shows, discussion, modeling, group research, internal or external circles, brainstorming, exchange of opinions, pair interviews, case method, virtual seminars, video conferences, webinars, project method, etc.), which ensures active inclusion of the individual.

An integral part of the model is the pedagogical conditions, which include: the formation of positive motivation for learning and self-development of entrepreneurial qualities that contribute to improving the level of competitiveness in future activities; the presence in the content of physics of educational material that contributes to the preparation of schoolchildren for the future life; providing a holistic interdisciplinary content of the lesson of entrepreneurial orientation in the learning process; educational and methodological support; special training of innovative teachers and the formation of their entrepreneurial qualities; support of students' entrepreneurial initiatives by the teacher; orientation of the educational process on the formation of personality qualities (entrepreneurship, initiative, perseverance, activity; use of individual, group and collective cognitive activity in various combinations; the ability of students to create their own individual educational product; purposeful development of cognitive, social, psychological reflection of students.

The result unit promotes the ability of students to analyze and adequately evaluate their results. To achieve the goal, entrepreneurial culture is considered in the context of a set of knowledge, skills and value orientations according to the criteria of formation: motivational, cognitive-cognitive, activity and creative.

Prospects for further development: The conducted research does not exhaust all aspects of the effective formation of students' entrepreneurial culture. Further scientific research requires the use of modern technologies, as well as coordination of the content of physics education.

Conclusion. Hence, the structural and functional model described by us combines target, theoretical and methodological, content, procedural and result units that have their own content and meaning. The implementation of this model makes it possible to significantly increase the level of formation of the entrepreneurial culture of secondary school students at lessons of physics.

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Муха А. П. Методика формирования предпринимательской культуры учеников на уроках физики.

В статье осуществлено обобщение научных трудов по вопросу формирования предпринимательской культуры. На основе терминологического анализа ключевых понятий («культура», «предпринимательская культура», «предпринимчивость») раскрыта сущность и уточнено понятие «предпринимательская культура учащихся». Акцентировано внимание на значении, которое приобретает формирование предпринимательской культуры у молодых людей в наше время. Определены проблемы формирования предпринимательской культуры учащихся основной школы и разработаны предложения по их устранению. Описана модель формирования предпринимательской культуры учащихся, состоящая из блоков: целевого, теоретико-методологического, содержательного, процессуального и результативного блоков. Сосредоточено внимание на освещении потенциала научных подходов и принципов к формированию предпринимательской культуры

учащихся. Акцентируется внимание на целесообразности применения аксиологического, акмеологического, проблемного, системно-деятельностного, компетентностного, интеграционного, личностно-ориентированного подходов как важной методологической основы для формирования предпринимательской культуры учащихся на уроках физики.

Определен комплекс педагогических условий, влияющих на формирование предпринимательской культуры учащихся на уроках физики. Выделены в структуре предпринимательской культуры учащихся компоненты: аксиологический, теоретический, технологический, креативный. Предложено использование методов и форм работы для формирования предпринимательской культуры учащихся основной школы.

Определены критерии сформированности предпринимательской культуры на уроках физики, а именно мотивационно-ценностный, когнитивно-познавательный, деятельностно-практический и творческий. Установлено, что вопрос формирования предпринимательской культуры учащихся на уроках физики остается недостаточно разработанным в педагогической теории и практике. Указано перспективы дальнейших научных исследований.

Ключевые слова: предпринимательская культура, формирование предпринимательской культуры учащихся, уроки физики, модель предпринимательской культуры.

Муха А. П. Методика формування підприємницької культури учнів на уроках фізики.

У статті здійснено узагальнення наукових праць щодо питання формування підприємницької культури. На основі термінологічного аналізу ключових понять («культура», «підприємницька культура», «підприємливість») розкрито сутність та уточнено поняття «підприємницька культура учнів». Акцентовано увагу на значенні, яке набуває формування підприємницької культури у молодих людей в наш час. Визначено проблеми формування підприємницької культури учнів основної школи та розроблено пропозиції щодо їх усунення. Описано модель формування підприємницької культури учнів, що складається з блоків: цільового, теоретико-методологічного, змістового, процесуального та результативного блоків. Елементами моделі виступають мета, завдання, методологічні підходи, загальнодидактичні та специфічні принципи, компоненти, етапи, зміст, педагогічні технології й умови, форми і методи процесу формування підприємницької культури учнів, критерії та рівні сформованості. Зосереджено увагу на висвітленні потенціалу наукових підходів та принципів до формування підприємницької культури учнів. Акцентовано увагу на доцільність застосування аксіологічного, акмеологічного, проблемного, системно-діяльнісного, компетентнісного, інтеграційного, особистісно-орієнтованого підходів як важливої методологічної основи для формування підприємницької культури учнів на уроках фізики. Визначено комплекс педагогічних умов, які впливають на формування підприємницької культури учнів на уроках фізики. Виокремлено у структурі підприємницької культури учнів компоненти: аксіологічний, теоретичний, технологічний, креативний. Запропоновано використання методів та форм роботи для формування підприємницької культури учнів основної школи. (рольові ігри, інсценізації, моделювання й «мозковий штурм», «фізичний експромт», «пазли», «асоціативний куц», дискусії, дебати та ін.). Визначено критерії сформованості підприємницької культури на уроках фізики, а саме мотиваційно-ціннісний, когнітивно-пізнавальний, діяльно-практичний та творчий. Встановлено, що питання формування підприємницької культури учнів на уроках фізики залишається недостатньо розробленим у педагогічній теорії і практиці. Зазначено перспективи подальших наукових розвідок.

Ключові слова: підприємницька культура, формування підприємницької культури учнів, уроки фізики, модель підприємницької культури.