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PEDAGOGICAL CONDITIONS FOR THE FORMATION OF CARTOGRAPHIC ACTIVITY OF FUTURE GEOGRAPHY TEACHERS

Abstract

Pedagogical conditions for the development of cartographic activity among future geography teachers, an essential part of professional training, are considered in the article. Changes in the educational space defined the role of future teachers in the educational process. In the context of the development of digital technologies and the increasing demands on academic programs, teachers must have the competencies to use cartographic methods in the educational process effectively. The study aims to determine the pedagogical conditions that contribute to the formation of cartographic activities of future geography teachers. In research, activity and competence approaches are analysed as modern theoretical frameworks for the formation of cartographic activity. The methods and means of forming cartographic activities are described. In the educational system, special attention is paid to the practical bases of carrying out cartographic activities. To determine the pedagogical conditions, a questionnaire was administered to the participants. The survey questions were compiled using a Likert scale. In the research, the pedagogical conditions necessary for cartographic activity are defined, and suggestions for improvement are provided. These conditions will effectively shape cartographic activity and can serve as a basis for increasing teachers' cartographic training. In conclusion, the main findings of the research are summarised, and the importance of developing cartographic activities as an integral part of the formation of a modern geography teacher as a professional specialist is emphasised.

Keywords: pedagogical conditions, geography teacher, cartographic activity, pedagogical process, educational environment.

Introduction

The modern education system faces high demands from society, the economy and technology. The main factor in ensuring the effectiveness and quality of the educational process is creating a pedagogical condition (situation) that fosters the development of each learner's abilities and personal attributes. Such conditions not only optimise the learning environment but also require the use of methods and technologies in the implementation of pedagogical activities. *The purpose of the study* is to determine the pedagogical conditions for the formation of the teacher's cartographic activity. In research, scientists often focus on the mechanisms of implementing pedagogical activities and the organisation of educational and professional activities. Analysing scientific studies to determine the pedagogical conditions for implementation in the discipline defines the relevance of the research topic. The main objectives of research: analysis of theoretical works, study of teaching methods and tools, and determination of practical significance.

Pedagogical conditions are considered as an important element of the educational process, they create a suitable environment for learning and development of personality. Optimum pedagogical conditions help the teacher organise educational activities necessary for learners' education, skill and competence development, the formation of personal qualities, future professional activities, and social adaptation.

Suppose the science of pedagogy is the science of teaching and educating the younger generation. In that case, it consists of the theoretical basis of the formation and development of individual and his preparation for life, and these objectives are carried out through the pedagogical process. Here, the teacher plays the primary role as educator. The teacher's objective is to provide learners with a set of knowledge. This is a very high mission: forming a person as

an individual. The pedagogical profession is distinguished from other fields by its sense of responsibility.

Materials and methods of research

The interrelations between cartographic activity and pedagogical conditions have been identified. Their role and place in the educational process have been clarified. Through pedagogical conditions, it is possible to systematically develop geography teachers' cartographic activity. This represents one of the most essential components of the educational process. During the research, a theoretical analysis of scientific studies by both foreign and domestic scholars on cartographic activity and pedagogical conditions was conducted. The activity-based and competence-based approaches were taken as the methodological foundation. Based on a review of the scientific literature, the definitions of the concepts “cartographic activity” and “pedagogical conditions” were examined. Using the comparative analysis method, the pedagogical conditions for the formation of cartographic activity were determined by comparing the views of various researchers. A survey of learners revealed the significance of pedagogical conditions in the development of cartographic activity. The mentioned scientific methods contributed to identifying the relevance of the research topic, determining the conditions for the formations of cartographic activity, and drawing conclusions.

Results and their discussion

E.I. Prikhodchenko and other scientists, in their research, have considered A. Distverg the founder of the active scientific method. He considered that «the processes of education and upbringing of a person are carried out through his internal activities». Scientist A.V. Khutorsky interprets the core of the activity approach in education as the development of learners' inner personalities and cultural-historical achievements. He divided educational activities into three: a reproductive approach to mastering educational materials, self-acquired knowledge, and knowledge that led to the creation of a personal product [1].

The introduction of the competence approach to the higher education system increases the competitiveness of specialists, improves interaction with the labor market. The formation of professional competence of specialists is defined by principles, pedagogical conditions, technologies, and approaches, and it specifies the requirements for qualification [2].

Pedagogical activity is a complex, organised system of activities. It consists of many system branches that connect different types of communication. The main mechanisms of its implementation are the functions of pedagogical activities. The following services are related to them (Figure 1).

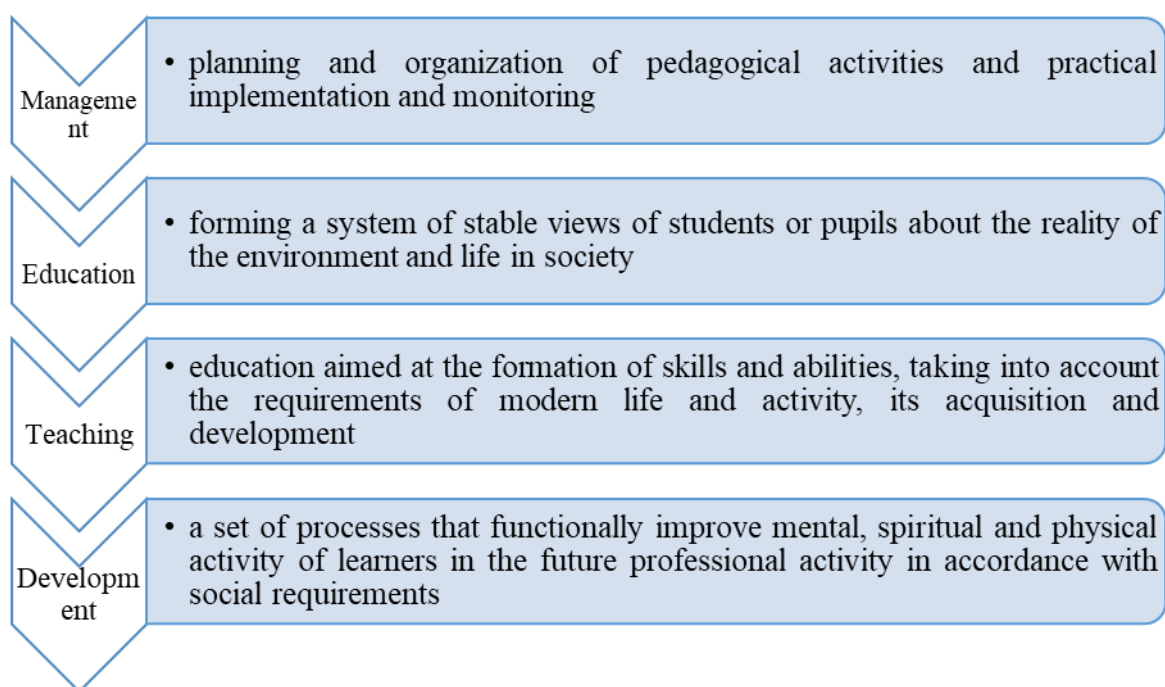


Figure 1 - Functions of pedagogical activity

Note: compiled based on the work of F. Mardanova

The professional-pedagogical direction is the frame within the teacher's personality structure that gathers the teacher's important personal qualities. The teacher's professional direction includes an interest in the teaching profession, pedagogical profession, professional-pedagogical intention and inclination [3].

At present, according to various sources of primary literature in pedagogy, pedagogical activity is used in the sense that it is a type of professional activity, that is, specially trained employees are not only focused on providing spiritual and practical experience, but also carry out the processes of personality development, education and teaching [4].

Several definitions and understandings of the pedagogical condition have been studied in the scientific literature and research works. Let's consider some of them.

A condition is a philosophical category that expresses the relationship of an object to the surrounding phenomena, without which it cannot exist. The condition consists of an environment that creates, develops and implements a situation. E.V. Kichigina mentions some pedagogical conditions in her research; for example, the selection of teaching content, the organisation of students' educational and professional activities, and the provision of the educational process with a material and technical base will ensure the effective functioning of the methodological system for the formation of students' scientific knowledge [5].

A.V. Sverchkov considers the pedagogical conditions as the principle-based connection of action processes for the management of processes aimed at the formation of individual's professional pedagogical culture [6].

Pedagogical conditions are the main components of the pedagogical system: they should be expressed as a set of educational opportunities and a material-spatial environment, which develop and change over time [7].

N.V. Ippolitova and N.S. Sterkhova defined pedagogical conditions as components of the pedagogical system that influence its personal and procedural aspects and ensure its effective functioning and development [8].

And Z.M. Filatova analyses the definitions provided by several scientists in the research work. Pedagogical condition is a set of measures aimed at increasing the effectiveness of

pedagogical activities. In conclusion, it is a set of necessary measures aimed at ensuring the effectiveness of pedagogical processes (i.e., determining the content, teaching forms, and methods) [9].

N. G. Bazhenova, I. V. Khludeeva divide pedagogical conditions as follows in their research works according to V. I. Dolgova:

- moral and psychological;
- organizational and pedagogical;
- scientific and methodological;
- educational material.

The pedagogical conditions they propose are defined as situations and consider education as a unity of situations, focused on the social environment, which interact on the basis of complementarity [10].

E. V. Sergeeva, M. Yu. Chandra, in their studies, explain the condition as a general scientific concept; in most cases, it is a defined set of conditions and reasons that contribute to the development and functioning of the object. Organisational-pedagogical conditions are a set of specific scientific conditions that reflect the capabilities of the studied object within the pedagogical system. They help to develop and function effectively [11].

The quality of education depends not on the teacher's knowledge and experience, but on the pedagogical methodology. Using the technology of technological pedagogical content knowledge (TPACK), it is possible to determine the pedagogical conditions for the formation of activities. Teachers need a deep understanding of how to teach their subjects [12].

Pedagogical content knowledge is the knowledge teachers use in teaching specific subjects to specific audiences. Mixed approach was used to determine the knowledge and practical activities of geography teachers. Prospective teachers choose different geographic topics and employ different goals and strategies in teaching them. As a result, various difficulties are encountered in the teaching of controversial issues. Studies have shown a significant gap between teachers' knowledge and practice [13].

K. K. Sagdieva and N. V. Mirza identified pedagogical conditions for the development of students' innovative thinking in their research: self-realisation, the implementation of innovative educational technologies, consideration of individuality, the creation of an innovative environment, and the role of the teacher-coordinator [14].

The theoretical and practical skills framework is highlighted as a component that shapes the prerequisites for the future specialist's professional competence. It is determined by the complex actions of organizing the learning and educational process [15].

Teachers are adapting to online or hybrid learning during the pandemic. In particular, Geography teachers, have begun to look for online alternatives to traditional field-based educational activities that connect theory and practice. In the online didactic activity on walking routes between two cities, students created the urban infrastructure using online cartography by interpreting different historical layers during workshop sessions. Students' geographical thinking skills have improved. Researchers considered that online cartographic exercises are an indispensable tool for geography teachers in educational practice [16].

The foreign researcher N. Friesen explains the pedagogical relationship as a specific connection between the elements of the pedagogical triangle, that is, between the teacher, learner, and subject. It is used in different ways depending on the context [17].

German pedagogue Hermann Knoll made a deep analysis of the pedagogical relationship, based on the personal relationship between the teacher and learner. Highlighting several features of the pedagogical relationship, he considers the teacher's influence on the learner's place in his life to be the most important [18].

Foreign researchers distinguish the characteristics of the teacher's teaching environment into two, the organizational environment and external environment. Teachers' professional

attitudes, organisational norms and learning culture, and the structures and policies influencing educational change are related to the organisational environment. The external environment comprises the social, institutional, and political factors outside the organisation that affect the teacher's educational activities [19].

Kathryn N. Hayes and other scientists studied the influence of organisational conditions on teachers' professional growth. Teachers have difficulty in implementing new ideas and strategies. Differentiated approaches to teaching reveal that the development of the teacher's personal qualities is achieved through the organisational environment [20].

Doctor of Pedagogical Sciences, Professor T.S. Komissarova who has been engaged in the theoretical issues of cartographic preparation in pedagogical higher educational institutions for many years can be mentioned in particular. The Russian research scientist laid the theoretical foundations for cartographic training for geography teachers. She created a structural-functional model of professional-methodical cartographic training of a geography teacher. The purpose of the model is to provide cartographic training for a geography teacher. The ways to achieve the goal consist of a process called content, means, methods. Structural blocks consist of specialised training, cartographic knowledge, teaching methods, and professional training [21].

Candidate of Pedagogical Sciences E. Sankova can be considered among scientists working in the direction of the formation of cartographic competence among students of pedagogical higher educational institutions. In her research work, the Russian research scientist considered the formation of cartographic competence in students of a higher educational institution through the means of professionally oriented teaching technology, as an example of training geographers, soil scientists, and ecologists using nature. According to her, cartographic competence is an integral part of professional training of university students. The scientist summarizes the cartographic competence of university students from scientific-pedagogical point of view as follows: cartographic competence is the ability to create cartographic works of various complexity, to analyze and use them, to make descriptions of cartographic sources and perform various measurement works for the implementation of educational and professional activities, the readiness and ability to implement the set of knowledge and skills acquired from cartographic subjects in the topographic survey of the local area [22].

From this, we consider it necessary to pay special attention to the methods of activity and competence in the formation of teachers' cartographic activities. It is necessary to provide many practical, creative, and research tasks in the development of cartographic activities. Therefore, we conclude that future geography teachers need an optimal pedagogical environment for working with cartographic sources, analysing and predicting thematic maps, and performing cartometric work on maps.

Analysing the works of research scientists, it can be observed that the pedagogical conditions for the formation of cartographic activities remain incompletely developed in the pedagogical process. To practically determine the pedagogical conditions for the formation of cartographic activities of future teachers of the subject of geography, a questionnaire consisting of five questions on Likert scale was created, inserted into a Google Form and distributed among the 2nd course students of the 6B01515-Geography Education Program at the department of «Geography and Ecology» of the Abai KazNPU. 73 students voluntarily participated in the survey and answered questions within two to three minutes. 57,5 % of respondents were women, 42,5% were men. As for the differences in age structure, 61,6% are under 18-20 years old, 19,2% are between 16-18, and 19,2% are over 20 years old (Figure 2).

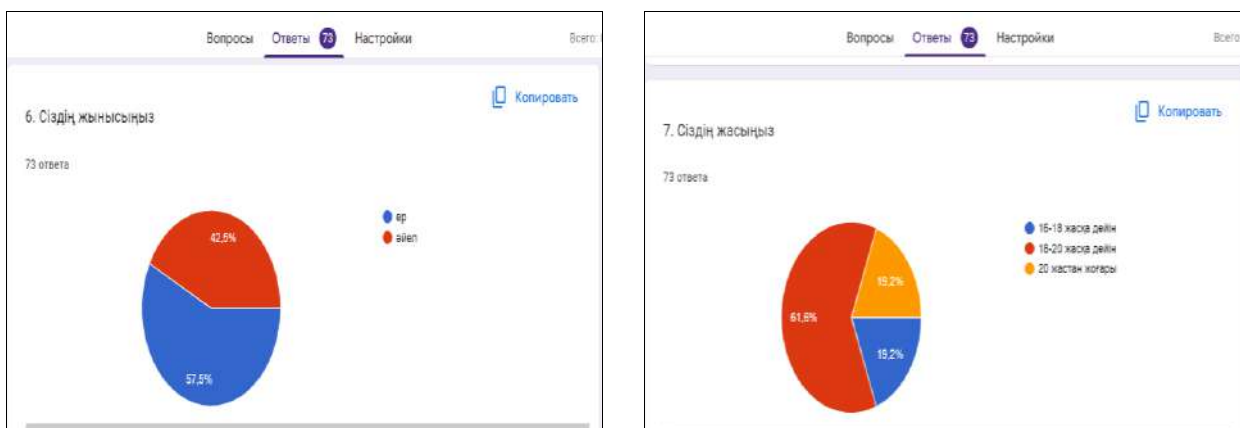


Figure 2 - Gender and age structure of survey participants

Note: The result obtained based on the survey

Survey results. 43,8% agreed and 2,6% disagreed with the statement «Practical experience of working with maps is very important for developing cartographic skills». The majority of participants, 52,1%, answered that the educational materials and resources provided by the geography education program effectively contribute to the development of cartographic skills and 1,3% indicated that they were not at all effective. 47,4% answered that it has a strong influence, and 6,6% answered that it has a slight influence to the question «Do educational field practices under the «Geography» educational program affect the formation of cartographic activities?». 39,5% answered that they were moderately confident and 1,3% were not confident at all to the question «As a future geography teacher, how confident are you in your ability to interpret and analyze maps?». 57,9% said they were satisfied and 2,6% said they were not satisfied to the question "Estimate your general level of pedagogical conditions for the formation of cartographic activities in the geography education program».

It was confirmed that the pedagogical conditions are not fully met in the formation of the teacher's cartographic activity during the analysis of the questionnaire content. It still needs to be researched.

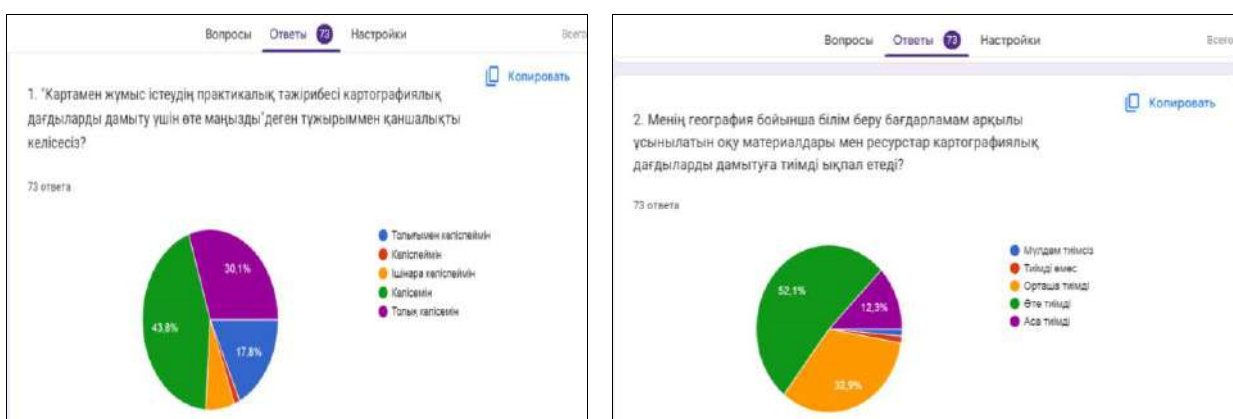


Figure 3 - Answers of the survey participants to the questions 1, 2

Note: the result obtained based on the survey

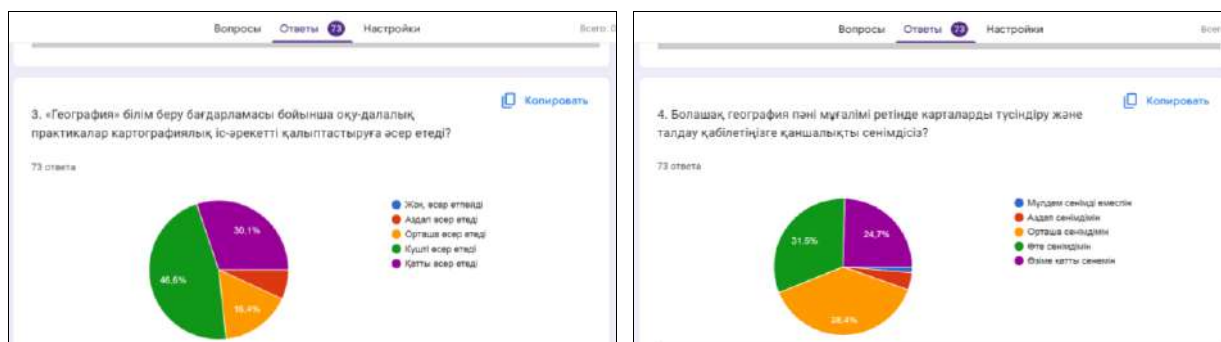


Figure 4 - Answers of the survey participants to the questions 3, 4

Note: the result obtained based on the survey



Figure 5 - Answers of survey participants to the question 5

Note: the result obtained based on the survey

The formation of cartographic activity is considered an important direction in the professional training of future geography teachers. It is manifested through the ability to work with maps as a source of geographical information. To properly develop this activity, it is necessary to establish specially designed pedagogical conditions that ensure the effectiveness and integrity of the educational process. Pedagogical conditions create opportunities for the effective formation of cartographic activity among future geography teachers. The content of cartographic activity and the pedagogical conditions for its formation are represented as interrelated factors that ensure the effective acquisition of cartographic knowledge and skills by future teachers of geography. The implementation of these conditions contributes to shaping competent geography teachers and constitutes one of the key components of teaching cartographic activities. Based on analyses of scientific research and theoretical studies, the pedagogical conditions required for the development of cartographic activity among future geography teachers are illustrated in figure 6 below.

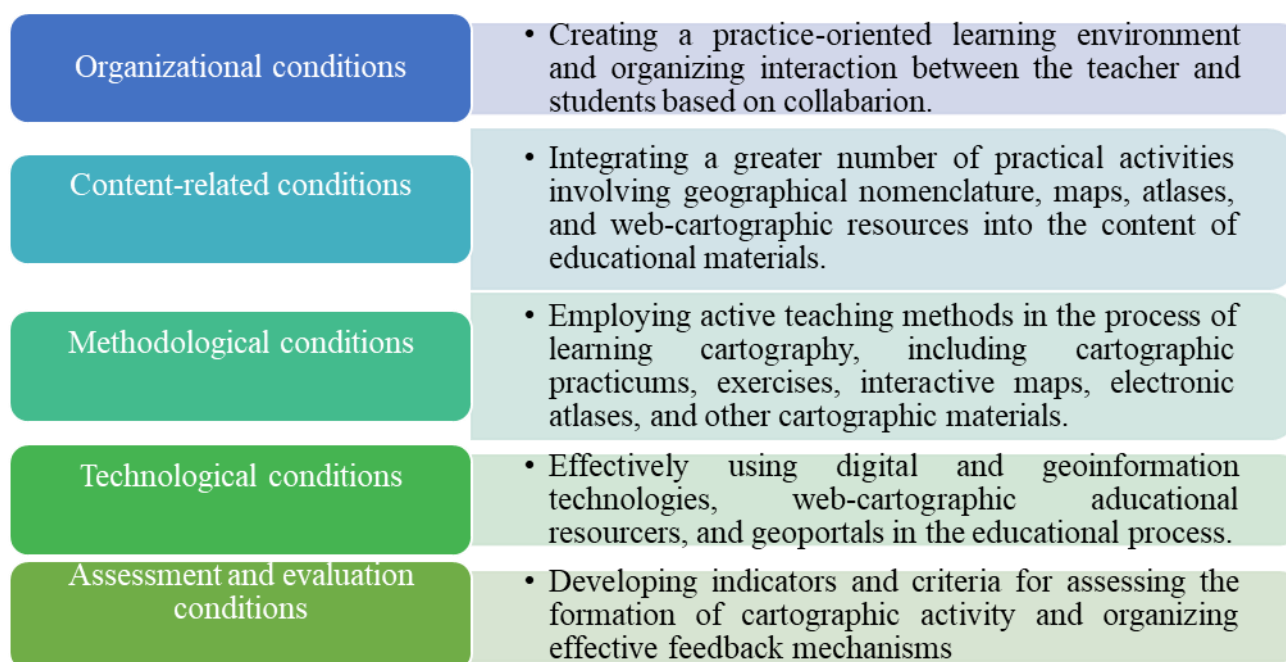


Figure 6 - Pedagogical conditions in the formation of cartographic activity

Note: Author's compilation based on analysis of scientific sources related to the research topic

If these pedagogical conditions are fulfilled, we consider that the teacher's cartographic activities will be successfully implemented in the teaching process.

Conclusion

Pedagogical conditions play an important role in ensuring the effectiveness, unity and consistency of the educational process. In teacher professional training, pedagogical conditions create a favourable environment for the development of professional competencies, personal qualities, and subject-specific skills of future specialists. Properly organised pedagogical conditions ensure the integration of theoretical knowledge and practical experience, increase teachers' cognitive activity, and strengthen their motivation for self-education and professional development. Also, pedagogical conditions facilitate strengthening cooperation between the teacher and the student and the effective use of active teaching methods and modern educational technologies. In the formation of cartographic activities of future geography teachers, pedagogical conditions determine the structure, content and methods of teaching. They provide a methodological basis for the systematic acquisition of cartographic knowledge and skills, and contribute to improving professional competence and to the formation of readiness for the use of maps and geoinformation technologies in educational practice.

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ПЕДАГОГИЧЕСКИЕ УСЛОВИЯ ФОРМИРОВАНИЯ КАРТОГРАФИЧЕСКОЙ ДЕЯТЕЛЬНОСТИ БУДУЩИХ УЧИТЕЛЕЙ ГЕОГРАФИИ

Аннотация

В статье рассматриваются педагогические условия формирования картографической деятельности будущих учителей географии, являющиеся важной составляющей профессиональной подготовки. Изменения в образовательном пространстве определили роль будущих учителей в учебном процессе. В условиях развития цифровых технологий и повышения требований к образовательным программам учителям необходимо обладать компетенциями, чтобы они могли эффективно использовать картографические методы в учебном процессе. Цель исследования - выявить педагогические условия, способствующие формированию картографической деятельности учителей географии. В исследовательской работе анализируются деятельностные, компетентностные подходы как современный теоретический подход к формированию картографической деятельности. Описываются методы и средства формирования картографической деятельности. Особое внимание уделяется практическим основам осуществления картографической деятельности в системе образования. Для определения педагогических условий были опрошены участники. Вопросы анкеты были составлены на основе шкалы Лайкерта. В исследовательской

работе определены педагогические условия, необходимые для картографической деятельности. Эти условия будут эффективно формировать картографическую деятельность и могут послужить основой для повышения уровня картографической подготовки учителей. В заключении определены основные выводы исследования и подчеркнута важность развития картографической деятельности как неотъемлемой части становления современного учителя географии как профессионала.

Ключевые слова: педагогические условия, учитель географии, картографическая деятельность, педагогический процесс, образовательная среда.

БОЛАШАҚ ГЕОГРАФИЯ ПӘНІ МҰҒАЛІМДЕРІНІҢ КАРТОГРАФИЯЛЫҚ ІС-ӘРЕКЕТІН ҚАЛЫПТАСТЫРУДЫҢ ПЕДАГОГИКАЛЫҚ ШАРТТАРЫ

Андатпа

Мақалада кәсіби дайындаудың маңызды құрамды бөлігі болып табылатын мұғалімдердің картографиялық іс-әрекетін қалыптастырудың педагогикалық шарттары қарастырылады. Білім беру кеңістігіндегі өзгерістер болашақ мұғалімдердің оқу үдерісіндегі рөлін айқындап берді. Сандық технологиялардың даму жағдайында және білім беру бағдарламаларына қойылатын талаптардың күшеюіне байланысты мұғалімдер оқу үдерісінде картографиялық әдістерді тиімді пайдалана алатындай құзыреттіліктерге ие болуы қажет. Зерттеудің мақсаты – мұғалімдердің картографиялық іс-әрекетін қалыптастыруға ықпал ететін педагогикалық шарттарды анықтау. Зерттеу жұмысында картографиялық іс-әрекетті қалыптастырудың заманауи теориялық тәсілі ретінде іс-әрекеттік, құзыреттілік тәсілдер талданады. Картографиялық іс-әрекетті қалыптастырудың әдістері мен құралдары сипатталады. Білім беру жүйесінде картографиялық іс-әрекетті жүзеге асырудың практикалық негіздеріне ерекше назар аударылады. Педагогикалық шарттарды анықтау үшін қатысушылардан сауалнама алынды. Сауалнама сұрақтары Лайкерг шкала негізінде құрастырылып берілді. Зерттеу жұмысында картографиялық іс-әрекетке қажетті педагогикалық шарттар анықталды. Бұл педагогикалық шарттар тиімді картографиялық іс-әрекетті қалыптастыра алады және мұғалімдердің картографиялық дайындық деңгейлерін арттыруға негіз бола алады. Қорытындыда зерттеудің негізгі тұжырымдары айқындалып, заманауи мұғалімнің кәсіби маман ретінде қалыптасуының ажырамас бөлігі ретінде картографиялық іс-әрекетті дамытудың маңыздылығы атап өтілді.

Негізгі сөздер: педагогикалық шарттар, география пәні мұғалімі, картографиялық іс-әрекет, педагогикалық үдеріс, білім беру ортасы.

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