DEVELOPING STUDENTS' COMPETENCE IN THE CONCEPT OF SUSTAINABLE DEVELOPMENT IN SCHOOL GEOGRAPHY EDUCATION

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Abstract: This article examines the methodological foundations for developing students' competence in sustainable development concepts within school geography education. It explores the possibilities of integrating the environmental, economic, and social dimensions of sustainable development into the content of geography education. The development of students' sustainable development competence is substantiated through cognitive, axiological, activity-based, and reflective components. The article highlights the didactic potential of problem-based learning, project-based learning, case studies, geographical research, work with maps and statistical data, and analysis of local geographical problems. Criteria and methodological conditions for developing and assessing students' competence in sustainable development are also proposed.

Keywords: geography education, sustainable development, competence, sustainable development competence, geographical thinking, environmental education, problem-based learning, project-based learning, geographical research, competency-based approach.

1. INTRODUCTION

In the 21st century, the intensification of environmental problems, the growing need for the rational use of natural resources, climate change, population growth, urbanization, and disparities in the socio-economic development of regions have made sustainable development an important area of the education system [1]. Sustainable development involves not only ensuring economic progress but also protecting the natural environment, taking into account the needs of society, and safeguarding the interests of future generations.

The goals set out in the United Nations 2030 Agenda for Sustainable Development demonstrate the particular importance of education in this area. In particular, providing quality education and developing individuals' knowledge, skills, values, and attitudes necessary for sustainable development are considered important objectives [2]. Therefore, modern school education should not be limited to equipping students with knowledge; rather, it should create an educational environment aimed at developing their competence to understand and analyze real-life problems and make responsible decisions.

The content of geography provides broad opportunities for developing students' competence in sustainable development. Geography studies natural components, natural resources, population, the economy, environmental problems, and processes of regional development in their interrelationships. In the process of geographical education, a comprehensive analysis of issues such as human–nature relationships, the use of natural resources, environmental security, regional economic development, and living standards contributes to students' understanding of the principles of sustainable development.

At the same time, sustainable development issues in school geography education are often addressed within individual topics, while the integration of students' knowledge in this area with practical activities, independent research, and decision-making has not been sufficiently systematized

[3]. As a result, students may have information about an environmental or socio-economic problem but may not fully possess the competence to analyze its causes from a geographical perspective, assess its consequences, and develop practical proposals for addressing it.

Addressing this problem requires the content and methods of geography education to be reorganized based on a competency-based approach [4]. This requires the systematic use of tasks, problem situations, projects, case studies, and geographical research activities aimed at developing students' competence in sustainable development.

The aim of the study is to identify effective methodological opportunities for developing students' competence in the concept of sustainable development within school geography education and to substantiate mechanisms for their implementation in the educational process.

The main objectives of the study are as follows: to clarify the content of sustainable development competence from the perspectives of pedagogy and geographical education; to identify its structural components; to determine the potential of geography education for developing sustainable development competence; to select effective teaching methods; to develop criteria for assessing competence; and to formulate methodological recommendations for geography lessons.

2. MATERIALS AND METHODS

The methodological basis of the study consists of competency-based, systemic, student-centered, activity-based, and problem-based learning approaches. The concept of sustainable development was considered based on the interrelationship of its environmental, economic, and social dimensions.

The study may employ such methods as theoretical analysis, pedagogical observation, questionnaires, testing, interviews, analysis of students' practical and project work, and pedagogical experimental studies. Through theoretical analysis, the interrelationship between sustainable development and education, the content of the competency-based approach in geography education, and issues related to developing students' competence in sustainable development are examined.

During the pedagogical observation process, students' abilities to identify geographical problems, analyze geographical data, explain cause-and-effect relationships, develop proposals for solving problems, and substantiate their opinions are observed.

Questionnaire and test tasks are designed to determine students' knowledge of sustainable development issues, their level of understanding of environmental and socio-economic problems, and their ability to apply geographical knowledge in practical situations. In this regard, alongside reproductive questions, it is appropriate to use problem-based and situational tasks.

The pedagogical experimental study is intended to determine the effectiveness of the methodological system aimed at developing students' competence in sustainable development. The content of the experimental study may include problem-based tasks, project work, case studies, geographical research, analysis of maps and statistical data, as well as activities focused on studying local geographical problems.

It is appropriate to identify four main components when assessing students' competence in sustainable development:

Cognitive component – the acquisition of knowledge about the content, principles, and geographical foundations of sustainable development, natural resources, environmental problems, and the regional development of population and the economy.

Axiological component – a responsible attitude toward nature, natural resources, and society; awareness of environmental values; and consideration of the interests of future generations.

Activity-based component – the ability to analyze geographical data, identify problems, assess their causes and consequences, develop practical solutions, and make decisions.

Reflective component – the ability to evaluate one's own activities, analyze the consequences of decisions made, and improve one's activities when necessary.

Based on these components, students' competence can be assessed at low, medium, and high levels. The assessment should be based not only on the amount of theoretical knowledge acquired but also on the ability to apply this knowledge in geographical and real-life situations.

3. RESULTS AND DISCUSSION

The research findings demonstrate that the systematic use of the content and methodological potential of school geography education creates effective pedagogical conditions for developing students' competence in sustainable development.

In developing sustainable development competence, it is particularly important to connect the content of geography education with real regional problems. For example, issues such as the use of water resources, desertification, soil degradation, climate change, waste management, urbanization, population density, and disparities in the economic development of regions can be presented to students as problem-based situations.

Within this approach, students become active participants who investigate problems and seek solutions rather than merely recipients of ready-made conclusions. In this regard, problem-based learning serves as an important means of developing the activity-based component of sustainable development competence.

For example, based on the question, "What measures can be taken to reduce water scarcity in the region?", students first study the available geographical data, analyze the spatial distribution of water resources using maps, identify the natural and anthropogenic causes of the problem, and develop proposals for addressing it. Such a task simultaneously develops geographical knowledge, analytical thinking, environmental values, and practical decision-making skills.

The project method is of particular importance in developing students' sustainable development competence. Project-based tasks encourage students to independently search for information, select and analyze data, present results, and draw conclusions. For example, projects such as "Environmental Problems of My Region," "Rational Use of Water Resources," "A Sustainable City Model," and "Expanding Green Spaces in the Local Area" provide opportunities to connect geographical knowledge with practical activities.

The case study method can be used to develop decision-making competence based on real or real-life geographical situations. Students are presented with an environmental, demographic, or economic problem in a particular region and are required to identify its causes, compare available alternatives, and justify the most appropriate solution.

One of the important characteristics of geography as a subject is working with maps. Therefore, the use of the cartographic method is considered effective in developing sustainable development competence. By analyzing environmental problems, population density, natural resources, water distribution, agriculture, or urbanization processes using thematic maps, students develop their spatial thinking.

Working with statistical data is also an important means of developing competence. Students may be provided with data on population size, the level of urbanization, water consumption, land resource use, or economic indicators and asked to compare the data, identify trends, and interpret them from a geographical perspective. As a result, students progress from simply receiving numerical information to transforming it into analytical conclusions.

The geographical research method also plays an important role in developing sustainable development competence. Students can observe the environmental conditions of their local area,

identify local problems, collect and analyze data, and develop practical recommendations. Such activities strengthen the connection between geography and real life and foster a sense of regional responsibility among students.

Rather than applying these methods separately, it is more effective to integrate them into a unified methodological system. In this case, the educational process can be organized according to the following sequence:

identifying a geographical problem → collecting data → geographical analysis → identifying the causes and consequences of the problem → developing alternative solutions → selecting the most appropriate solution → evaluating the results and reflection.

This sequence makes it possible to consistently develop all the main components of students' sustainable development competence.

In addition, the use of local geographical materials in geography lessons increases students' interest in sustainable development issues. Studying global problems through the example of a local area makes them more concrete and understandable to students. For example, by studying local problems related to water use, land degradation, waste, green spaces, transport, and urbanization, students can connect the principles of sustainable development with their everyday lives.

On this basis, the development of students' sustainable development competence in geography education can be organized according to the principle of "knowing – valuing – applying – evaluating." At the "knowing" stage, students acquire the necessary geographical knowledge about sustainable development; at the "valuing" stage, a responsible attitude toward nature and society is developed; at the "applying" stage, knowledge is applied in practical and problem-based situations; and at the "evaluating" stage, students analyze the outcomes of their decisions and activities.

This approach makes it possible to transform geography education from a process focused solely on the acquisition of knowledge into an educational process based on students' practical activities and independent decision-making.

4. CONCLUSION AND RECOMMENDATIONS

Developing students' competence in the concept of sustainable development within school geography education is one of the important methodological directions of modern geography education. The study of natural, social, and economic processes from a spatial perspective in geography provides broad opportunities for incorporating the principles of sustainable development into educational content.

Based on the research findings, it was determined that students' sustainable development competence should be developed through the interrelationship of cognitive, axiological, activity-based, and reflective components. In this regard, it is necessary to consider not only students' knowledge of sustainable development but also their abilities to analyze geographical problems, understand environmental and social values, develop practical solutions, and evaluate their own activities.

The systematic use of problem-based learning, the project method, case studies, geographical research, and methods of working with maps and statistical data in geography lessons is recommended as an effective methodological means of developing students' sustainable development competence.

The following recommendations are provided for school geography teachers:

Teaching geography topics by connecting them with the environmental, economic, and social dimensions of sustainable development.

Providing students with problem-based tasks based on real-life and regional geographical problems.

Organizing students' independent research and project activities using local geographical materials.

Increasing the number of tasks aimed at analyzing maps, statistical data, diagrams, and other sources of geographical information.

When assessing students' sustainable development competence, taking into account not only theoretical knowledge but also their skills in analyzing problems, developing solutions, making decisions, and engaging in reflection.

Using the methodological sequence "identifying the problem – analyzing it – developing a solution – making a decision – evaluating the results" in geography lessons.

Thus, integrating the principles of sustainable development into the content and methodology of geography education contributes to connecting students' geographical knowledge with practical activities, strengthening their environmental and social responsibility, and developing their competence to make well-founded decisions regarding sustainable development issues.

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