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Exploration on Strategies for Cultivating Senior High School Students' Geographic Thinking Ability from the Perspective of Core Literacy

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Abstract: With the advancement of the new round of curriculum reform, core literacy has become an important issue in the field of education. As a comprehensive discipline, the cultivation of core literacy in geography is of great significance for improving senior high school students' thinking ability. Based on this, this paper puts forward the necessity of cultivating senior high school students' geographic thinking ability, and proposes specific cultivation strategies from the aspects of connection thinking ability, innovative thinking ability, problem-inquiry teaching mode, and the application of information technology. The aim is to provide theoretical basis and practical guidance for the cultivation of senior high school students' geographic thinking ability, so as to promote the improvement of geography education quality and meet the requirements of educational reform in the new era.

Keywords: Core literacy; Senior high school students; Geographic thinking ability; Cultivation strategies

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1. Basic elements of core literacy in high school geography

From the perspective of core literacy, cultivating high school students' geographical thinking ability needs to be based on the basic elements of geographical core literacy. Through systematic teaching design and practice, it helps high school students gradually form a scientific geographical thinking mode. The basic elements of geographical core literacy include regional cognition, comprehensive thinking, view of human-land coordination, and geographical practical ability.

Regional cognition refers to high school students' ability to understand the spatial distribution and regional characteristics of geography. Students can analyze geographical phenomena from a spatial perspective and grasp the spatial distribution laws of geographical things. Comprehensive thinking is the multi-angle and multi-level analytical ability formed by high school students in geography learning. Geography is highly comprehensive, with close connections between geographical things. Students need to analyze the essence of geographical problems from the multi-dimensional perspectives of physical geography and human geography. The view of human-land coordination is an important value orientation of geography, emphasizing the harmonious coexistence between humans and the natural environment. By cultivating this view, high school students can establish the concept of sustainable development, understand the impact of human activities on the natural environment, and learn how to achieve coordinated development between humans and

nature through scientific planning and rational use of resources. Geographical practical ability refers to the practical and problem-solving abilities formed by high school students in geography learning. Students should apply the geographical knowledge they have learned to practical situations to solve real-world geographical problems. These basic elements of geographical core literacy form an organic whole that is interrelated and mutually reinforcing. Regional cognition provides the foundation for comprehensive thinking; comprehensive thinking supports the formation of the view of human-land coordination; and geographical practical ability is the key to putting these literacies into practice. Through the cultivation of geographical core literacy, high school students can not only master geographical knowledge but also develop scientific geographical thinking ability, laying a solid foundation for lifelong learning and future development.

1.1. Significance of cultivating high school students' geographical thinking ability

Geographical thinking ability is a comprehensive ability formed by high school students in the process of learning geography. It is not only reflected in the understanding and memory of geographical knowledge but also emphasizes students' ability to analyze, reason, and solve problems when facing complex geographical issues. Cultivating high school students' geographical thinking ability is of great significance for improving their comprehensive quality, fostering scientific spirit, and enhancing practical ability. Firstly, cultivating geographical thinking ability helps improve high school students' comprehensive quality. Geography is a highly comprehensive discipline, involving multiple fields such as physical geography, human geography, and regional geography, and is closely related to disciplines like history, environmental science, and economics. By developing geographical thinking ability, students can better understand the essence of geographical phenomena and their underlying logical relationships, thereby forming an interdisciplinary way of thinking. Secondly, cultivating geographical thinking ability is an important way to foster scientific spirit. The research methods of geography are scientific, emphasizing the verification of geographical phenomena and laws through observation, experiment, data collection, and analysis. In the process of learning geography, high school students need to use scientific methods to think and solve problems, gradually forming a scientific inquiry attitude, and cultivating rigorous thinking and a realistic spirit. This scientific spirit is not only helpful for learning geography but can also be transferred to the study of other disciplines and daily life. Additionally, cultivating geographical thinking ability can enhance high school students' practical ability. Geography is closely related to real life. By developing geographical thinking ability, students can better understand the practical significance of geographical problems and learn to use geographical knowledge to analyze and solve real-world issues.

2. The necessity of cultivating senior high school students' geographic thinking ability

2.1. Senior high school students have an unclear understanding of the essence of geography

Geography is a comprehensive discipline that combines the characteristics of natural sciences and social sciences. Its core lies in cultivating senior high school students' spatial thinking ability, logical reasoning ability, and comprehensive analysis ability through the analysis of geographical phenomena, geographical processes, and geographical laws. However, in actual teaching, some teachers overemphasize the memorization of knowledge points and ignore the scientificity and practicality of geography, which makes it difficult for senior high school students to understand the internal logic of geography and form systematic geographic thinking. In addition, due to the wide range and strong comprehensiveness of geographical knowledge, some senior high school students easily feel confused in the learning process and have an unclear understanding of the essence of geography. They think that geography is just "recitation and memorization" and ignore its nature of scientific inquiry. This cognitive deviation leads to a lack of awareness of active thinking and in-depth exploration when learning geography, making it difficult for them to develop geographic thinking ability.

2.2. Senior high school students have a weak awareness of applying geographical knowledge

In the current practice of senior high school geography teaching, the problem that senior high school students have a

weak awareness of applying geographical knowledge is widespread. The formation of this phenomenon is closely related to the positioning of teaching objectives, the selection of teaching content, and the application of teaching methods. Many geography teachers focus more on the requirements of the college entrance examination in the teaching process, simplifying geographical learning into the memorization of knowledge points and the training of question types. Under such a teaching model, most senior high school students only pay attention to specific knowledge points that may appear in the exam, ignoring the integrity and comprehensiveness of geography. In addition, the weak awareness of applying geographical knowledge is also reflected in senior high school students' insufficient understanding of the practicality of geography. Geography is a highly practical discipline that not only focuses on the mastery of theoretical knowledge but also attaches importance to cultivating senior high school students' ability to observe, analyze, and solve geographical phenomena. However, at present, some senior high school students, due to the lack of practical application experience of geographical knowledge, find it difficult to recognize the importance of geography in real life, which further weakens their enthusiasm for learning geography and restricts the improvement of their geographic thinking ability.

3. Strategies for cultivating senior high school students' geographic thinking ability from the perspective of core literacy

3.1. Cultivating senior high school students' associative thinking ability

Associative thinking ability refers to senior high school students' ability to organically connect different geographical knowledge points, understand the causal relationships between geographical phenomena, and thus form a complete geographical knowledge system. Senior high school geography teachers can guide students to connect and compare geographical knowledge through comparative analysis, helping them master geographical knowledge more efficiently and improve their answering efficiency. In teaching practice, comparative analysis is an effective method. For example, when teaching the lesson "Industrial Location Factors", teachers can guide students to conduct comparative analysis on the location factors of different industrial types. By raising the question "What are the differences in location selection between raw material-oriented industries and market-oriented industries?" and combining specific cases such as the location selection of iron and steel plants and electronic factories, students are guided to analyze the main factors affecting industrial layout, enabling them to better understand the diversity of industrial location factors and their impact on industrial layout. Secondly, teachers can further cultivate students' associative thinking ability by creating inquiry-based teaching situations. For example, in teaching, teachers can design an inquiry question: "Why do some industrial zones form industrial clusters? What impact do industrial clusters have on industrial development?" Through such questions, students need to connect industrial location factors with the formation of industrial clusters and analyze the optimizing effect of industrial clusters on industrial layout. In the inquiry process, students can not only understand the specific content of industrial location factors but also combine them with practical problems, forming a deeper understanding. Through the combination of comparative analysis and inquiry-based teaching situations, senior high school students can connect scattered geographical knowledge points to form a complete knowledge system. For example, when learning "Agricultural Location Factors", teachers can guide students to compare industrial location factors with agricultural location factors and analyze their similarities and differences. Students can find that although the location factors of industry and agriculture are different, they are both affected by natural conditions, economic conditions, and social conditions. Through such comparative analysis, students can more comprehensively understand the nature of geographical phenomena and improve their geographical thinking ability.

3.2. Cultivating senior high school students' innovative thinking ability

In senior high school geography teaching, innovative thinking ability can not only help students better understand geographical knowledge but also stimulate their interest in the geography subject and cultivate their ability to solve practical problems. In the teaching process, teachers can guide students to think innovatively in various ways, such as

through problem orientation, practical exploration, interdisciplinary integration, and other strategies, helping them form unique thinking styles. In specific teaching practice, teachers can design open-ended questions based on textbook content to guide students to think about the nature of geographical phenomena from multiple perspectives. For example, in the lesson "Development of Fluvial Landforms", teachers can design the following questions: "What factors affect the formation of fluvial landforms? How will the landforms change if the geological conditions of the area through which the river flows change?" These questions can not only guide students to review textbook knowledge but also stimulate their in-depth thinking about geographical phenomena. In this way, students can gradually form innovative thinking and learn to analyze geographical problems from different perspectives. In addition, teachers can organize study groups and encourage students to discuss and explore within the groups. In group activities, students can share their views and spark new ideas. For example, in the teaching of "Development of Fluvial Landforms", teachers can divide students into several groups and ask each group to simulate the formation process of fluvial landforms under different geological conditions, and display their research results by drawing diagrams or making models, thereby cultivating students' teamwork ability, stimulating their innovative thinking, and helping them understand geographical knowledge in practice. In the teaching process, teachers can also combine information technology to design some virtual experiments or simulation scenarios to help students understand geographical phenomena more intuitively. For example, through the simulation of geographic information systems, students can observe the changes of fluvial landforms under different geological conditions, so as to have a deeper understanding of the development laws of fluvial landforms. Finally, cultivating senior high school students' innovative thinking ability requires teachers to pay attention to openness, practicality, and comprehensiveness in teaching design, and stimulate students' creativity and thinking ability through diversified teaching methods and activities. For example, in the teaching of "Development of Fluvial Landforms", teachers can guide students to think about the relationship between fluvial landforms and climate, vegetation, and human activities, thereby helping them establish an interdisciplinary thinking mode. In general, cultivating senior high school students' innovative thinking ability requires teachers to focus on openness, practicality, and comprehensiveness in teaching design, and stimulate students' creativity and thinking ability through diversified teaching methods and activities.

3.3. Exploratory teaching model for applied problem-based learning

High school geography teachers' adoption of the problem - exploratory teaching model in the teaching process can effectively stimulate senior high school students' geographical thinking ability and help them grasp the essence of geographical knowledge in the process of thinking. Take the teaching of the lesson "Atmospheric Movement Caused by Uneven Heating and Cooling" as an example. Teachers can design a series of progressive questions to guide senior high school students to start from phenomena, gradually conduct in - depth analysis of problems, and finally form systematic geographical thinking ability. First of all, teachers need to clarify teaching objectives and design questions that can stimulate senior high school students' thinking. For example, when explaining the principle of atmospheric movement caused by uneven heating and cooling, teachers can put forward the following questions: "Why does uneven heating and cooling occur on the Earth's surface?" "What atmospheric movement phenomena can be caused by uneven heating and cooling?" "What impact do these atmospheric movements have on our lives?" These questions can guide senior high school students to start from phenomena and gradually deeply understand the impact of uneven heating and cooling on atmospheric movement. Secondly, teachers should pay attention to guiding senior high school students to analyze and summarize in class. For instance, when explaining the formation of thermal circulation, teachers can design a question: "If an area receives more solar radiation and has a higher temperature, what changes will happen to the air in this area?" By guiding senior high school students to think about the phenomenon that air expands and rises when heated and is supplemented by surrounding cold air, they can gradually understand the formation process of thermal circulation. Teachers can further ask: "If the area with uneven heating and cooling expands, how will the scale of atmospheric movement change?" This helps senior high school students connect local phenomena with the overall atmospheric movement and form a more complete geographical thinking. Through the problem-exploratory teaching model, senior high

school students can gradually form systematic geographical thinking ability. This requires teachers to pay attention to the openness and inspiration of questions when designing them, and avoid overly simple or closed questions, so as to ensure that senior high school students can gain more learning experience and growth space in thinking.

3.4. Using information technology to achieve knowledge transfer

The rapid development of information technology has provided new tools and methods for geography teaching. Especially from the perspective of core literacy, information technology can effectively help senior high school students achieve knowledge transfer and improve their geographical thinking ability. First of all, the application of navigation software in geography teaching can help senior high school students establish the connection between geography and real life. By using navigation software, senior high school students can intuitively observe the distribution and changes of geographical space. For example, when learning regional geography, teachers can guide senior high school students to use navigation software to plan routes from one city to another and analyze the impact of topography and geomorphology on transportation routes. Secondly, the 3D visualization function is an important tool for cultivating senior high school students' geographical spatial imagination ability. Geography involves a large number of spatial concepts, such as topography and geomorphology, climate distribution, plate movement, etc. These contents are relatively abstract and difficult to fully understand only by textbooks and 2D maps. However, through 3D visualization technology, senior high school students can intuitively observe the three-dimensional structure of geographical space. For example, when learning topography and geomorphology, teachers can use 3D visualization software to show the formation process of mountains, helping senior high school students understand geological processes such as plate collision and fold uplift, and cultivating their spatial imagination ability, so that they can better construct geographical spatial models. Finally, the layer superposition function can help senior high school students cultivate their comprehensive analysis ability of geographical space. Geographical phenomena are the result of the joint action of multiple factors. For example, urban site selection needs to comprehensively consider factors such as topography, climate, and resource distribution. Through the layer superposition function, senior high school students can superimpose different geographical elements to analyze their relationships and influences. For example, when learning urban planning, teachers can guide senior high school students to use the layer superposition function to analyze topographic maps, climate maps, traffic network maps, etc., discuss the rationality of urban site selection, and help them learn to analyze geographical problems from multiple angles and levels, and cultivate their comprehensive analysis ability.

4. Conclusion

In summary, through a systematic analysis of the core literacy elements of geography as a discipline, as well as the cognitive biases and thinking limitations existing in high school students' geography learning, we have clarified the necessity and importance of cultivating geographical thinking ability. The cultivation of geographical thinking ability not only helps high school students better understand the essence of geography, but also improves their ability to comprehensively apply geographical knowledge to solve practical problems. By continuously optimizing teaching strategies and innovating teaching methods, geography education will better serve the improvement of high school students' comprehensive quality and contribute to cultivating builders and successors of the socialist cause with innovative spirit and practical ability.

Disclosure statement

The author declares no conflict of interest.

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