

Study on typical Ideological and political Cases and Teaching Strategies of GIS Course

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Abstract: By combining the ideological and political materials of GIS course, this dissertation selects seven typical cases as the ideological and political cases of GIS course, integrates the professional content of each chapter for teaching, and guides students to integrate their personal ideal pursuit into the cause of the country and the nation.

Keywords: Curriculum ideology and politics; GIS; Typical Case; Teaching Strategy.

1. Introduction

Curriculum ideological and political philosophy refers to a comprehensive educational concept that integrates various courses and ideological and political theory courses to form synergistic effect in the form of constructing the pattern of "three-whole education" of whole-society education, whole-process education and all-round education, and takes "What, how and for whom" as the fundamental task of education.

2. Case analysis of curriculum Ideology and politics

2.1. Typical Case (1)

According to the National Space Administration (CNSA) report "My China heart, the Beidou spirit shines in space" excavate the connotation of "China heart": first, China's independent property rights chip technology; Second, the technical core of our navigation (Remote Sensing) system. The research and development process of the Beidou Navigation Satellite System combines with the ideological and political theory of GIS course.

2.2. Typical case (2)

Due to the irregularity of the earth's shape, various countries have made numerous measurements of the Earth in different historical periods, leading to the emergence of a large number of ellipsoids. Before 2008, China used Hayford and Krasovsky and other ellipsoids. Since July 1, 2008, China has fully used the 2000 National Geodetic Coordinate System, which is the concrete embodiment of the global geocentric coordinate system in China. Its origin is the mass center of the whole Earth including ocean and atmosphere, and its ellipsoid parameters are measured and mapped with the authorization of the State Bureau of Surveying and Mapping. The origin and application of the 2000 National Geodetic Coordinate System combines with the ideological and political theory of GIS course.

2.3. Typical case (3)

Cases in which GIS technology plays an important role in the process of dealing with various sudden geological disasters, such as timely transmission of information, real-time data sharing and scientific analysis. Enhancing students'

national pride, establishing the consciousness of science and technology power, and stimulating the feelings of returning to the motherland are the combination points of ideological and political courses. For example, in the 2008 Wenchuan earthquake, GIS was used to determine the graded impact range of the earthquake, the number of people involved and the road damage in the earthquake. In the 2010 Zhouqu mudslide disaster in Gansu province, based on the high-resolution remote sensing image data, the disaster factors of the disaster bearing body, such as disaster scope, affected population, crop loss, and traffic line damage, were analyzed and the intensity of the disaster was evaluated.

2.4. Typical case (4)

During the epidemic prevention and control period, China used big data and geographic information systems to analyze the epidemic development and prevention and control measures, published real-time dynamic maps of the epidemic on a daily basis (such as the "different epidemic map" of Hypergraph), and carried out studies on the estimation of the national population flow, the spatial prediction of the epidemic scale, the division of geographical risks and the discovery of the shortage of medical resources. This has provided important scientific and technological support for China's space epidemic prevention and control. At the same time, in strengthening international cooperation and sharing epidemic information, Chinese GIS experts and researchers have reflected the spirit of mutual trust and cooperation across national boundaries and the international sentiment of solidarity and win-win. That is the case of using GIS technology to analyze the spatio-temporal changes of COVID-19 and its relationship with living environment in China's fight against COVID-19.

2.5. Typical case (5)

The Red Army Long March GIS case. Based on the special cartographic expression and spatial-temporal thinking mode in GIS teaching, the historical process of the Red Army Long March can be directly displayed, and the related historical facts and concepts of the Long March can be re-recognized from the perspective of geography [1]. In addition, the GIS case of Laozi thought communication also closely combines the ideological and political aspects of the course with the organic integration of the midpoint, line and plane data of GIS

major in the GIS system, multi-channel visual display and spatial analysis.

2.6. Typical case (6)

Combination of targeted poverty alleviation and ideological and political education in GIS course. As the most important political and current affairs in China and even the world, "targeted poverty alleviation" has a long-time span and wide coverage, and the related people, places, events and other information contain rich ideological and political elements of the curriculum. "People", "places" and "events" can be used as the classification clues, and the geographical information cognitive method is used. Excavate and construct ideological and political elements on different scales at the national, provincial or city (county) level [2].

2.7. Typical case (7)

Super Map software is the case of GIS software with national independent intellectual property rights. The software series products combine GIS, IT and BIM to create a smart city technology system, including smart park, smart building, smart street township, smart airport, smart urban management, smart logistics, etc. The progress of software technology and the international leading status enhance the national sense of honor and national pride of our nationals. We will further strengthen our confidence in our culture, theory, system and path.

3. Curriculum ideological and political teaching strategies

3.1. Chapter (1)

The first chapter is the introduction to GIS, which mainly clarifies the definition of GIS, the five components of GIS, the main functions of GIS and the future development trend, and emphasizes the deep understanding of the basic concepts of GIS and the development and evolution of GIS from technology to industry to discipline, so as to build a comprehensive knowledge system about GIS. Combining the two knowledge points in this chapter, one is the development trend of GIS, the other is the remote sensing image data, one of the important data sources of GIS. In combination with the ideological and political points of the case (1), it introduces the development situation of China's self-developed Beidou navigation satellite system and China's aerospace industry, so as to cultivate students' feelings of home and country and enhance their national pride. Establish a sense of science and technology power, inspire students to return the feelings of the motherland.

3.2. Chapter (2)

The second chapter is the GIS data structure, which mainly solves the geospatial data stored in GIS in what form. Combining two knowledge points, one is the geodetic coordinate system involved in the concept of geospace, the other is the spatial object characteristics of points, lines and planes in the vector data structure. With combining of the case (2) introducing the origin of the National 2000 Geodetic Coordinate System and in the poor areas in Case (6) "points, lines and polygons" and "people, land and things", the mining of ideological and political elements of the course of GIS can enhance students' sense of pride and honor as future builders and successors of the cause of socialism with Chinese characteristics in the new era, and cultivate students'

confidence in socialist culture and cultivate students' awareness of turning professional and technical knowledge into problem-solving ability with the world in mind.

3.3. Chapter (3)

Spatial data processing and spatial database, mainly introduces the operation of spatial data itself and the storage and management of spatial data. Combined with the data processing and conversion of super map software, the construction of data model, and the ideological and political content of fusion case (7), it explains the evaluation and standard of domestic software, as well as the comparison and analysis with foreign software. Highlight the supporting power of domestic software key technologies, and awaken students' consciousness of power in science and technology and talent.

3.4. Chapter (4)

Principles and methods of spatial analysis is the core content of GIS. Theoretical courses of digital terrain model analysis, spatial superposition analysis, buffer analysis and network analysis are interspersed with practical courses of various topics, and combined with case (3) Using spatial analysis methods such as buffer analysis to simulate and calculate various data before, during and after geological disasters. Disaster assessment and disaster early warning forecast; In combination with case (6), GIS software is used to carry out digital terrain feature analysis, to understand the poverty situation in the poverty-stricken area, the main causes of poverty and the decision-making support methods for poverty alleviation, and to increase students' spiritual recognition of courage, perseverance, unity and dedication.

3.5. Chapter (5)

GIS system design and evaluation is a geospatial entity database and application model specially developed to meet user needs according to specific users and application purposes [3]. In combination with Case (5) Design and implementation of the Red Army Long March GIS system, through the symbolic expression of the Red Army Long March route information, the analysis of the topographic characteristics of the Red Army Long March route, and the quantitative analysis of the Red Army Long March route information space [1]. Let students more deeply remember the history, remember the martyrs, carry forward the Red Army Long March spirit; Learn more deeply the revolutionary spirit of the Red Army predecessors, and establish firm ideals and beliefs; Forge the quality of taking the bull by the horns and facing difficulties head-on.

3.6. Chapter (6)

The sixth chapter is the output design of GIS products. After spatial data processing and spatial analysis, various products are output by visual methods, including maps, images, charts, etc. In combination with Case (4) "Different Epidemic Map", students are guided to pay attention to the world and the situation of the epidemic in different countries, and dynamic data are used to analyze and simulate the situation of the epidemic development, so as to cultivate students' international vision and international feelings of unity and win-win.

Table 1. Correspondence between ideological and political contents of course chapters and typical cases

Chapter	Typical case	Ideological and political content of the course
1	(1)	Cultivate students' feelings of home and country, and establish a sense of science and technology power.
2	(2)(6)	Strengthen national pride, foster a sense of responsibility as a major country, build confidence in our socialist culture.
3	(7)	Understand the core competitiveness of domestic software key technologies; Awaken the consciousness of making China stronger in science and technology and stronger in human resources.
4	(3)(6)	Inspire students to be brave and resolute, unity and struggle, dedication and other spiritual identity.
5	(5)	Bearing in mind the history, remembering the martyrs, carrying forward the spirit of the Red Army Long March, learning the revolutionary spirit of the Red Army predecessors, and establishing firm ideals and beliefs; Forge the quality of taking the bull by the horns and facing difficulties head-on.
6	(4)	Advocate the spirit of international cooperation, build a global vision, and cultivate the spirit of mutual trust and cooperation across national boundaries, and the international spirit of unity and win-win.

4. Conclusion

The ideological and political construction of GIS curriculum is similar to the process of "salt dissolves in water". It reflects the teaching concept of "moistening things silently" from the aspects of curriculum construction objectives, curriculum content design, curriculum knowledge value, curriculum teaching methods and so on. It cultivates students to establish a correct world view and methodology, establishes a knowledge map integrating socialist core values, and shows the humanity in scientific research, eventually grow into a person with great character and noble feelings.

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