

# *A teaching method of ideological and political education in colleges and universities based on knowledge graph*

Qinli Deng<sup>1</sup>, Conglin Zhang<sup>2</sup>, Wenxuan Yu<sup>3</sup>, Xuqi Wang<sup>1</sup>

<sup>1</sup>*School of Electronic Information, Xijing University, Xi'an, 710123, China*

<sup>2</sup>*College of Computer Science and Cyber Security, Chengdu University of Technology, Chengdu, 610059, China*

<sup>3</sup>*College of Humanities, Shaanxi University of Technology, Hanzhong, 723001, China*

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**Abstract:** Ideological and political education is an important part of higher education in China. Knowledge mapping is to connect all kinds of information to form a relationship network. This paper puts forward a teaching method of ideological and political courses in colleges and universities based on knowledge atlas. The knowledge atlas is used to relate the ideological and political education of the curriculum, build a multi-level knowledge system, define, organize, manage and transform the abstract knowledge, attributes, associations and other information into a real database, integrate the teaching content and relevant ideological and political content of the curriculum, give full play to the educational function of the professional courses of data base, and overcome the difficulties in the ideological and political education of technical courses, The teaching design and practice exploration of "ideological and political curriculum" were carried out.

## 1. Introduction

In order to thoroughly implement the spirit of the Ministry of Education's Guiding Outline for Ideological and Political Construction of University Courses and other documents, further improve teaching methods, promote the application of case teaching in ideological and political teaching of university courses, strengthen the sharing of ideological and political experience of courses, and improve the quality of ideological and political teaching of courses, the Undergraduate School of Beijing Jiaotong University launched a series of excellent cases of ideological and political courses. In January 2022, the undergraduate school has promoted the first batch of national level curriculum ideological and political demonstration courses of the Ministry of Education and the cases of Beijing curriculum ideological and political demonstration courses. The Department of Higher Education of the Ministry of Education launched 699 courses of ideological and political education, 699 famous teachers and teams of ideological and political education, and 30 research and demonstration centers of ideological and political education. Starting from the "point", we should focus on "point" to promote "line", and "line" to lead "face". It has built 10 curriculum ideological and political resource databases and digitized high-quality resources. It has built more than 1400 excellent curriculum ideological and political courses and more than 3700 excellent cases of curriculum ideological and

political. The ideological and political case section of the course will successively show the elegant demeanor of the ideological and political demonstration courses of colleges and universities [1-3]. General Secretary emphasizes that make good use of the main channel of classroom teaching, all kinds of courses go hand in hand with ideological and political theory courses, form synergy effect and realize the whole process and all-round education. The Guiding Outline for Ideological and Political Construction of Courses in Colleges and Universities issued by the Ministry of Education points out that "professional courses are the basic carrier of ideological and political construction of courses". In the teaching of professional courses, college teachers deeply promote the close integration of professional education and ideological and political education, combine the characteristics, thinking methods and values of different courses, deeply tap the ideological and political elements of the curriculum, and organically integrate the curriculum teaching. "Ideological and political curriculum" has increasingly become one of the hot spots of researchers with the high attention paid by society to ideological and political education in colleges and universities, and has increasingly shown its significance in the construction of higher education teaching reform [4, 5]. Ideological and political education runs through the talent training system, comprehensively promotes the ideological and political construction of college courses, gives full play to the educational role of each course, and improves the main aspects of the quality of college talent training. In order to learn, one must first make up one's mind. Once the ambition is established, the knowledge can be put forth in order. Ambitious determination will never help. To become a socialist builder and successor, we must establish a correct world outlook, outlook on life and values, and closely link the realization of personal values with the future and destiny of the Party and the country. Adhere to the principle of establishing morality and cultivating people, and the curriculum of ideological and political education is the key to cultivating socialist builders and successors. With the development of artificial intelligence, Internet of Things and big data technology, people are faced with the challenge of how to organize, store and use the constantly updated massive data. KG is an important part of artificial intelligence. It has the ability to store, manage, semantic mining and information interconnection of multi-source and multimodal complex data, and can connect various related information into a semantic relationship network. It has been successfully applied in the search field and intelligent Q&A by Google, Sogou, Baidu and other network giants. At present, many industry KGs have emerged, such as medical KGs, financial KGs, e-commerce KGs, and industrial product KGs. It has also been successfully applied in curriculum integration to provide information for various links such as curriculum thinking, hierarchical teaching, discipline association and extension experiments, and assist teachers to efficiently analyze the knowledge evolution process in relevant knowledge fields, So as to greatly improve the working efficiency of teachers. KG can run ideological and political work through the teaching process, promote ideological and political education, tap the moral elements of professional courses, and give full play to the educational function of professional courses . In order to accurately grasp the main content and hot areas of curriculum ideological and political research, Shen Shiguang et al. used 5131 journal literatures in CNKI database as samples to draw the knowledge map of curriculum ideological and political research through the visual quantitative analysis software CiteSpace. The results show that although the concept of ideological and political education of curriculum has not been put forward for a long time, the output of research results is large and shows a rapid growth trend. However, the research on the integration of ideological and political elements in professional courses, the improvement of ideological and political literacy of professional teachers and the evaluation of educational effects is still relatively weak, which is an area worthy of in-depth discussion in the future. Ideological and political Education is the Key Point of modern higher education teaching innovation. To gain a better understanding of the current status of curriculum ideological and political research in China, Wang Huan et al. collected relevant literature data from the CSSCI database and the CSSCI source journal database in CNKI, covering

the period from 2000 to 2021. They utilized the CiteSpace software to create a knowledge map and conducted analyses from various perspectives, including the trend of publication volume, core authors, major research institutions, influential journals and papers, keywords, and emerging topics. This approach allowed them to identify four main research themes: the connotation and characteristics of curriculum ideological and political education, the relationship between curriculum ideological and political education and ideological and political education curriculum, the obstacles encountered in implementing curriculum ideological and political education, and the practical approaches to curriculum ideological and political education. Furthermore, they outlined the frontiers and trends in curriculum ideological and political research. They concluded that exploring the role of teachers as the key agents, implementing curriculum ideological and political education in professional courses, and establishing an evaluation system for curriculum ideological and political education will become the focal points and priorities of future research in this field.

## **2. Ideological and political teaching method of database courses based on knowledge graph**

Although KG is able to integrate knowledge from different disciplines, different fields and constantly updated knowledge, and fully demonstrate the relevance between different knowledge points, different fields and courses, compared with professional fields such as databases, the ideological and political field is more serious, there is no special information induction platform, and the ideological and political information is scattered and growing with the time. In particular, China's ideological and political content is rich, including a variety of relationship categories. Therefore, it is not easy for the ideological and political field to use the limited relationship method to extract relationships. Because ideological and political news is mostly text based, some articles basically contain more ideological and political terminology, and because the path of socialism with Chinese characteristics is different from the national conditions of other countries, political activities are more practical and targeted, ideological and political knowledge points are fragmented, and the way to obtain ideological and political information manually is time-consuming and can not clearly and effectively reflect the main links of various ideological and political information, and there is a lack of structured ideological and political knowledge browsing platform. Knowledge atlas is a semantic relationship network that connects nodes with relation lines. It describes various relationships with graph structure, which is intuitive, natural and efficient. Therefore, this project plans to use knowledge atlas to combine professional knowledge with ideological and political knowledge, which can accurately and quickly reflect the semantic relationship between professional knowledge points and ideological and political knowledge points. Using KG, a network structure knowledge model can be established based on different knowledge points of the curriculum and ideological and political elements of the curriculum. This model integrates ideological and political elements into the teaching process of the database class and conducts association rules mining. This integration ensures the appropriate fusion, dynamic updating, and continuous improvement of professional knowledge points and ideological and political elements of the curriculum. It also allows for the organization and presentation of complex and diverse ideological and political knowledge into a systematic framework. The model enables the delivery of suitable ideological and political elements to the relevant knowledge points at the right time, thus enhancing the efficiency and quality of ideological and political learning in database courses. Ultimately, it aims to cultivate well-rounded and qualified individuals. By constructing a KG-based database course ideological and political education, different knowledge points and professional skills points at various learning stages of database courses can be associated with relevant ideological and political elements. This integration facilitates the organic fusion of professional knowledge points, ideological and political elements, and professional skills. It provides teachers and students with diverse professional and curriculum-oriented ideological and

political teaching content that caters to specific professional needs. Moreover, it enhances the options available for curriculum content. The research framework of ideological and political education of database courses based on knowledge map is shown in Figure 1.

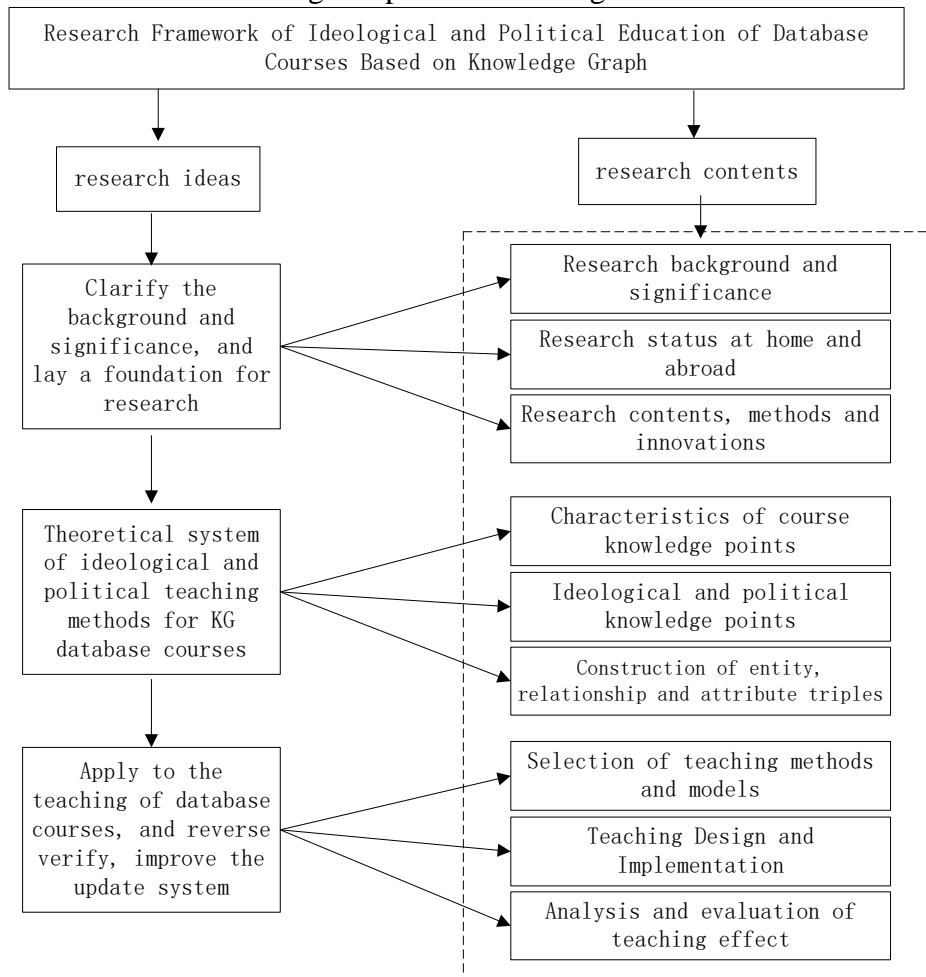


Figure 1: Research Framework of Ideological and Political Education of Database Courses Based on Knowledge Graph

KG construction includes top-down and bottom-up construction methods. The process is as follows:

(1) Use database class and upper ontology of ideological and political curriculum to build database class and content ontology of ideological and political curriculum, including concept extraction, concept attribute extraction, concept operation extraction, concept relationship extraction and concept assertion extraction.

(2) Use the database class and the upper ontology of the ideological and political curriculum to build the database class and the exercise ontology of the ideological and political curriculum, including the extraction of exercise types and types, the identification of the ontology elements and their relationships examined by the exercise, the construction of the exercise solving method, and the construction of the exercise solving process.

(3) For knowledge point data source, database class and ideological and political course content ontology and data course exercise ontology are used to build database class and ideological and political course KG, that is, instance extraction, concept instance relationship extraction, instance relationship extraction, instance operation extraction, instance attribute extraction and instance

attribute value or assertion extraction are conducted from data source.

(4) Data acquisition and pre-processing of ideological and political education. In this link, Baidu Encyclopedia semi-structured data in the field of ideological and political education is mainly extracted, and the academic journals on the research of teaching methods of ideological and political education in database courses from January 1, 2015 to November 1, 2022 included in the CNKI database of HowNet are taken as the research objects and knowledge points are extracted, mining the research hotspots, professional knowledge points, corresponding ideological and political knowledge points and possible development trends in the education and teaching field of database courses. Construct a Knowledge Graph (KG) related to the education and teaching methods of ideological and political education for database courses. Utilize keyword screening technology to retain the text portion with higher ideological and political relevance as the corpus for subsequent knowledge acquisition. Employ Cite Space to generate institutional cooperation maps, author cooperation maps, keyword co-occurrence maps, keyword clustering maps, and time zone maps. Analyze the results of the KG to provide a theoretical foundation for conducting quantitative analysis on the in-depth research of teaching methods for ideological and political education.

### 3. Summary

The ideological and political construction of curriculum in colleges and universities has played an important role in the teaching process. The key to the ideological and political construction of curriculum is teachers. This paper puts forward a teaching method of ideological and political education based on knowledge atlas. This method integrates the knowledge map into each link of students' professional knowledge learning, realizes the organic unity of college students' ideological and political education and professional knowledge learning, can give play to the collaborative role of ideological and political teachers and professional teachers, change the educational concept of professional teachers, mobilize teachers' initiative and creativity in curriculum reform, and improve teachers' theoretical knowledge and ability.

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