Application of Knowledge Graph in Ideological and Political Teaching

Guoping Zhu[1,a], Tingma Tao[1,b*]

[1]*School of Marxism Studies, Wannan Medical College, Wuhu, Anhui, China*
[a]*20200070@wnmc.edu.cn,* [b*]*taotingma@163.com*（*Corresponding Author*）

ABSTRACT

【Purpose/significance】With the deep integration of information technology and ideological and political courses teaching, knowledge graph can provides strong support for the in-depth learning of ideological and political courses.CiteSpace is used to analyze teaching materials and CNKI documents, carry out visual processing and apply them to teaching, hoping to improve students' interest in learning and test scores.【Method/process】This paper makes an empirical analysis of students' learning interest through a questionnaire, and the research process adopts the methods of direct analysis and comparative analysis.【Result/conclusion】Through the analysis of the questionnaire results, it is found that 97.5% of students have increased their interest in curriculum learning, which proves that the application of knowledge graph is effective.

Keywords: *knowledge graph; Ideological and Political Course; Online teaching*

1. INTRODUCTION

As a public compulsory subject uniformly deployed by the central government, all college and university students must complete five courses during their study.When the general secretary Xijinping presided over the Symposium for teachers of school Ideological and Political theory course, he stressed that "Ideological and Political theory courses are the key courses to implement the fundamental task of building morality and cultivating people". Up to now, ideological and political courses have received unprecedented attention.At the same time, it means that the state has put forward unprecedented high requirements for the teaching quality of ideological and political courses.

At present, the teaching of ideological and political courses in domestic colleges and universities, especially in Provincial Local Colleges and universities, still face great challenges, such as the contradiction between the importance of the course and the contempt of students and teachers of other majors, the contradiction between the rationality of the course content and the simplicity of the course teaching, the contradiction between the integration of the course design and the subsection of the course teaching, the contradiction between the continuous innovation of teaching methods and the failure of comprehensive and detailed coverage of large class teaching, etc. For these resaons, it is difficult to give full play to the due effect of Ideological and Political teaching.

After the "double first-class" construction was put forward, the teaching content innovation, method innovation, process management, assessment method reform and other aspects of ideological and political courses have ushered in the task. To solve these problems, we should return to the original intention of ideological and political courses design, that is, young college students have a comprehensive grasp of Marxism.

Especially under the influence of the COVID-19 epidemic, the characteristics of a new round of coronavirus with multi-point distribution and local outbreak, closed school management, and all courses are transferred to online teaching. The teaching quality needs to be guaranteed, and the knowledge graph has become a reasonable choice. The research content of knowledge graph nowadays includes three main steps: knowledge acquisition, knowledge fusion, knowledge calculation and application. The construction of knowledge graph needs to mine, analyze, draw and display knowledge and the relationship between knowledge, so as to make the original knowledge base more intelligent [6].

2. BASIC INFORMATION OF IDEOLOGICAL AND POLITICAL COURSES AND ONLINE TEACHING

2.1. Composition of ideological and political courses

The undergraduate ideological and political courses collection consist of five courses: Basic principles of Marxism(BPM), Outline of Chinese modern history(CMH), Mao Zedong Thought and the theoretical system of socialism with Chinese characteristics(MTC), Ideology and morality and rule of law(IML), Situation and Policy(SP). The former four courses have regular teaching materials, and the couse of Situation and Policy is adjusted according to the actual situation of each semester.

Table 1: Teaching design of I& P Courses.

Course	Chap ters	Class Hours	Content
BPM	7	48	What is Marxism?
CMH	14	32	What has happened in China in the past century?
MTC	10	80	What theoretical achievements has Marxism made in China?
IML	6	48	How does Marxism treat youth?
SP	4	32	How do young people shoulder the great responsibility?

The five courses are actually centered on the struggle of the Communist Party of China to realize the great rejuvenation of the Chinese nation under the guidance of Marxism. In the actual teaching process, the course does not run through this main line, but the teaching with different emphases in sections (Table 1), and the content richness of each textbook varies greatly.
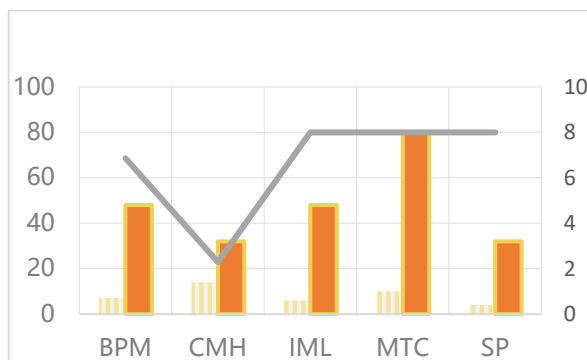

Figure 1: Average teaching time per chapter.

Due to the large differences between the teaching chapters and teaching hours of each course (Figure 1), the knowledge points required to be taught in each class hour of the same course are also different.

2.2. Dilemma of Ideological and Political Teaching

Different from other courses, the ideological and political courses collection is given a special mission, because the teaching effect of the ideological and political courses is related to the great rejuvenation of the Chinese nation and the future prospect of governing the country. Therefore, Ideology and Political teachers must do a good job in the ideological and political courses teaching. The core of Ideological and Political teaching is to fully implement the party's educational policy and solve the fundamental problem of who, how and for whom to cultivate people [7]. However, in the traditional teaching practice, there are still a series of problems, such as insufficient ability of teachers, insufficient attention of students, poor teaching effect of large classes and so on.

2.2.1. The nature of the courses is special (political).
The Communist Party of China has always regarded ideological and political courses as one of the fundamental symbols that distinguish socialist education from capitalist education [1]. From the perspective of teaching objectives, the ideological and political courses are mainly to transform people's thoughts and to make contemporary college students understand the 100 year course and achievements of the Chinese people led by the Communist Party of China. The transformation of thought is different from skill training. The particularity of the nature of the course puts forward significantly higher requirements for the teaching of this course than other courses.

2.2.2 Particularity of course content (theoretical).
There are strict restrictions on the content of teaching materials. In fact, there is only one core of the five courses, that is, the Communist Party of China. Based on the background of Chinese modern history, the textbook tells about Marxism as the guiding ideology, which takes root and prospers in China.

2.2.3. Unreasonable allocation of teacher team.
Since 2020, the Ministry of education has put forward requirements for the number of full-time teachers of ideological and political courses in public colleges, "colleges and universities should verify the posts of full-time Ideological and Political teachers in strict accordance with the proportion of teacher-student ratio of no less than 1:350 according to the total number of full-time students". On the one hand, the scale of Ideological and Political teachers in public universities has expanded rapidly, on the other hand, private colleges still continue the small scale of Ideological and Political

teachers. By the end of November 2021, more than 127000 full-time and part-time teachers of ideological and political courses in Colleges and universities had been registered in the database under the jurisdiction of the Ministry of Education, including more than 91000 full-time teachers. Compared with 2016, the total number of Ideological and Political teachers increased by 60000, including 45000 full-time teachers. [8]

2.2.4. The effect of large class teaching is difficult to achieve the expectation.
Traditionally, the teaching of ideological and political courses are taught in 3-5 administrative classes, with about 30 people in each administrative class. Therefore, the minimum teaching class is about 90 students, and most of them are close to 150 students. In such a large class, it is difficult to adopt new teaching methods such as

discussion and case, and the reduction of interaction will inevitably affect the teaching quality. Taking a university in Anhui province as an example, the final examination of the past two semesters was selected (Figure 2), Stomatology(150 students,$y = -0.0109x + 84.206, R^2 = 0.0093$), Forensic specialty(108 students,$y = 0.0157x + 78.411, R^2 = 0.0072$) Nursing specialty(142students,$y = 0.0187x + 74.349, R^2 = 0.0129$), Joint classes of public management, psychology and law(141students,$y = -0.0068x + 76.853, R^2 = 0.0016$). The average score of forensic students with a small number of classes is relatively stable, which is at the middle and upper level on the whole. The results of the combined class of public management, psychological, and law with a large number of students fluctuate greatly, with fewer students with high scores and more students with low scores.
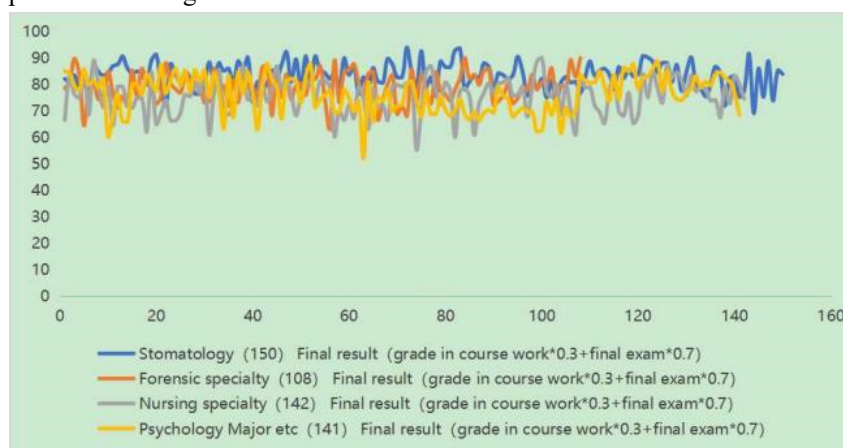

Figure 2: Final examination results of 4 classes.

2.2.5. Students despise public classes.
As the ideological and political courses collection is a public courses collection, in the past teaching practice, both teachers and students held a relaxed attitude towards each other, resulting in students' contempt for the course attitude, distraction in class, watching other contents and even absenteeism. Online teaching is more difficult to control the real effect of students' learning.

2.3. Opportunities and challenges of online teaching

In recent years, the application of information technology in college teaching has become more and more in-depth. The Ministry of education has launched a first-class curriculum construction scheme, including online courses and hybrid courses. It should be said that the double line integration teaching mode has become the mainstream.

2.3.1. Disadvantages of online teaching.
Although online education is the trend of contemporary education, it has encountered a series of challenges in its actual implementation. The main reason is that COVID-19

suddenly broke out, and colleges and universities could not cope well, resulting in emergency online teaching.

The carrying capacity of network infrastructure is insufficient, and the third-party live broadcasting platform originally serving the enterprise suddenly influx a large amount of traffic, resulting in login difficulties and other situations. Teachers' informatization skills are uneven. There are more than 28321 full-time and part-time teachers of ideological and political courses over the age of 49, accounting for 22.3%, more than 34417 full-time and part-time teachers of ideological and political courses without graduate education, accounting for 72.9%, and 82550 without senior professional titles, accounting for 65%. Students' self-discipline ability is seriously insufficient, and they are easy to become "marginal people" in classroom teaching, that is, individuals or groups of students who are separated from the center of teaching activities, are on the edge of classroom teaching, and have not been well developed [3].

From the perspective of teaching quality, compared with offline teaching, the effect of simple online teaching is not satisfactory. To a great extent, it compromises from improving teaching quality to

completing teaching content. According to a survey conducted by Li Minna, students are more willing to accept offline courses compared with pure online couses. The average time spent by students before online and offline teaching is close, but the time spent by teachers before online teaching is significantly longer than offline teaching. 63% of the students thought that online teaching would take longer to review after class, 95% of the students admitted that online teaching was distracted due to lack of interaction, and 73% of the teachers affected their passion due to lack of interaction. 73% of the teachers expected that the effect of online teaching would be worse than that of offline teaching, but 95% of the students believed that there was no significant difference in knowledge mastery by repeatedly watching the video. The final score of online teaching is no different from that of similar students in previous years; 91% of teachers and 79% of students recommend the combination of recording and broadcasting and live broadcasting as the future online teaching mode [4].

2.3.2. Advantages of online teaching. As an established fact, although there are many areas that need to be improved, on the other hand, there are also positive factors to provide experience for the improvement of two-line teaching in the future.

Firstly, highlight the advantages of content. Make use of rich multimedia education resources to enrich teaching forms and make teaching contents more interesting. As of March 2022, the number of online Mooc classes in China has exceeded 52000, the number of learners has reached 800 million, and the number of students who have received Mooc credits has reached 330 million. The number and scale of Mooc classes rank first in the world.

Secondly, obvious space-time advantages. Online education can save time for teachers and students on the way. When the network is available, teachers and students can communicate online anytime and anywhere without space constraints, saving resource costs and improving teaching efficiency.

Thirdly, there are various ways of interaction. Due to the introverted characteristics of Chinese students, they less actively participate in class discussions and more often remain silent in class. Bullet screen, message and other methods can provide students with more opportunities to show themselves.

Fourthly, the complete preservation of teaching materials. From online teaching check-in, roll call to homework correction can be realized through network technology, and the activity data carried out on the teaching platform can also be quickly and completely archived and retained, such as teaching videoes, student homeworks and test paper analysis, so as to facilitate unified integration research in the future.

Last but not the least, the cultivation of autonomous learning ability. Due to the resource sharing of online teaching, students can review at any time after class and choose more interesting contents for in-depth exploration.

3. APPLICATION OF KNOWLEDGE GRAPH IN IDEOLOGICAL AND POLITICAL TEACHING

3.1.   *Definition of knowledge graph*

With the deepening of the application of artificial intelligence education, the knowledge graph has attracted more and more attention. The concept of intelligence education based on cognitive intelligence has been put forward in the field of education. Although the related research of knowledge graph and cognitive graph is very rich, people often confuse concept graph, mind graph, knowledge graph, cognitive graph and thinking graph with the concepts of knowledge graph and cognitive graph [9].From the perspective of concept tracing, cognitive graph originated from environmental psychology, developed rapidly in educational psychology, and rapidly evolved into the cognitive graph of computer science under the strong promotion of artificial intelligence research(Fugure3) [2]

In November 2012, Google took the lead in proposing the concept of knowledge graph, saying that it would add the function of knowledge graph to its search results. Its original intention is to improve the ability of search engine and enhance users' search quality and search experience. Subsequently, there was an upsurge of semantic network research all over the world. Knowledge graph technology is based on relevant research results, which is a sublation and sublimation of the existing semantic network technology.
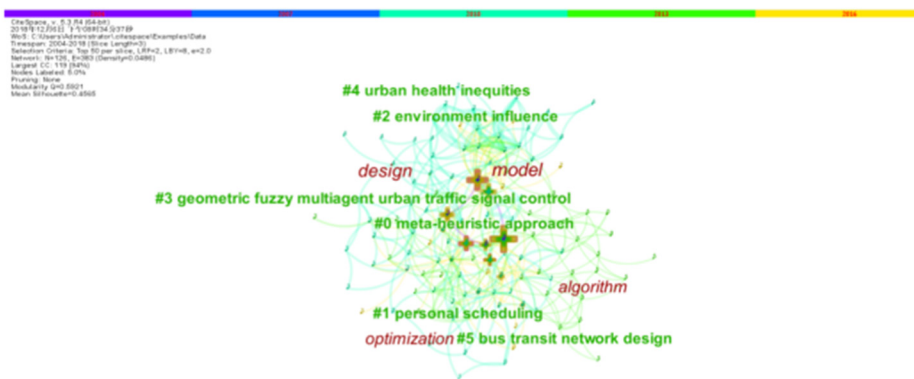
Figure 3: An example of knowledge graph.

Now, the generally accepted definition of knowledge atlas is a modern theory that achieves the purpose of multi-disciplinary integration by combining the theories and methods of Applied Mathematics, graphics, information visualization technology, information science and other disciplines with the methods of Metrology citation analysis and co-occurrence analysis, and using the visual atlas to vividly display the core structure, development history, frontier fields and overall knowledge structure of the discipline.

3.2.   Functions of knowledge graph

Knowledge graph is a new way of information arrangement, which can play a new supporting role in higher education, form new learning habits and improve teaching efficiency.

Firstly, the knowledge graph establishes the relationship between knowledge points. In the past teaching practice, both students and teachers pay more attention to the exploration in their own field, and it is difficult to form a joint force in the construction of knowledge system, so for learners, they can not see the panorama of relevant knowledge [5].

Secondly, the knowledge graph focuses on the focus issues. The focus question is a specific question that needs to be answered by a thinking diagram. The focus question helps to screen out the concepts irrelevant to the question answer, making the thinking diagram more focused, so as to accelerate the solution of the problem.

Thirdly, the knowledge graph can effectively expand the knowledge reserve. Since Google put forward the knowledge graph, it has set off a research upsurge and turned to application in many fields earlier than the education sector. Personalized recommendation, intelligent question and answer and other fields have been very mature (Table 2). At the same time, we continue to explore smart business model, smart market insight and smart membership system.

Table 2: Teaching design of ideological and political courses.

Mature field	Representative products
Intelligent semantic search	Google,Bing,Facebook
Wearable devices	Apple watch
Personalized recommendation	Taobao,Tiktok
Anti-fraud identification	Telecom,Public Security
Clinical decision making	IBM Watson Health
Intelligent Q &A	Ailixiaomi
Personal assistant	Siri,Amzon Echo

3.3.   Application effects and feedbacks of knowledge graph

Since the spring semester of 2021, new teaching modes such as problem chain, OBE (outcomes based education), hibl (hands on inquiry based learning), knowledge graph and so on have been tried in the ideological and political courses of Marxism College of WM College(a provincial university). The knowledge graph of ideological and political courses needs a lot of preliminary preparation and can only be popularized after a small-scale test.

3.3.1. The design principle of knowledge graph of ideological and political courses. Because of its abstractness, complexity and universality, the design of ideological and political courses must follow two principles, the principle of objectiveness and the principle of universality. The principle of objectiveness refers to the full consideration of the characteristics of the teaching object. The basic characteristics include ideological diversity, strong self-awareness, exploring new things, etc. The principle of universality refers to fully considering the characteristics of five courses and

trying to adopt a simple and understandable model. The two principles can not only ensure that teachers can effectively increase the supply of high-quality teaching content, but also fully consider the acceptance of students.At the same time, CiteSpace is used to collect the relevant data of CNKI for visual processing.

3.3.2. The knowledge graph life cycle of ideological and political courses.
The first step is to establish the core and extract data. The core of the ideological and political courses is the Communist Party of China. Based on this, the relationship between the Communist Party of China and Marxism is established. The second step is error correction. Manual intervention is needed in the early stage to review the correctness of each link. The third step is to complete. Considering that data extraction mainly comes from teaching materials, the richness of knowledge needs to be further supplemented. The fourth step is to update. As socialism with Chinese characteristics enters a new era, there are new materials every year, but its core subject will not be convenient. The fifth step is refinement. After two years of curriculum experiments, we will gradually sort out the completed knowledge graph.

3.3.3. The knowledge graph of ideological and political courses uses feedback.
According to the teaching effect of knowledge graph, 40 students are randomly selected from different classes for investigation, and the feedback is relatively positive. It is generally believed that knowledge graph can effectively improve the learning interest and learning quality of ideological and political courses. Facts have proved that the application of knowledge graph in Ideological and Political teaching can well support the goal of ensuring teaching quality put forward by the teaching management body, the high-level supply expected by Ideological and Political teachers, and the high-quality teaching resources expected by undergraduates (Table 3).Through comparative analysis, it is found that after using the knowledge map, students' final grades are also improved from 72.5 to 75.35.

Table 3: Questionnaire response .

Question	Yes	Uncertain	No
Easier to understand the teaching content	38	1	1
More interested in the course	39	0	1
Increased learning convenience	36	4	0
Apply to other aspects	33	5	2
Recommend to others	32	8	0

4. CONCLUSIONS

The application of educational technology is the future development trend, which can make up for the shortcomings of classroom teaching.

According to the small-scale random survey, the knowledge graph is applied to the teaching of ideological and political courses, and the students' satisfaction is high. 97.5% of the students thought that they had increased their interest in learning the course, and 82.5% of the students tried to learn to use the knowledge graph and apply it to the study of other courses.

The teaching of ideological and political courses turns around the situation that students don't like to listen, and the application of knowledge graph is effective.

ACKNOWLEDGEMENTS

REFERENCES

[1] Chen Xixi,Dong Yue(2020).On the "important foundation" and "fundamental guarantee" of integrity and innovation in ideological and political courses. J. Leading Journal of Ideological & Theoretical Education,07,95-100.

[2] Jia Guo Ling, Rong-Guo Ma, Zhi-Hua Hu(2019),Review of Urban Transportation Network Design Problems Based on CiteSpace.J. Mathematical Problems in Engineering, vol. 2019.

[3] Jin Lisong(2021).Identification and transformation of "marginal people" in online teaching.J.Modern Education Management,04,106-112.

[4] Li Minna, Zhou Jian, Sun Lijuan(2021).Analysis of Problems with online teaching of ophthalmology for undergraduates duiring COVID-19 epidemic.J. International Eye Science,1,140-143.

[5] Wan Haipeng(2021).Research of Open Learner Model Based on Learning Cognitive graph.J. Modern Educational Technology,31.97-104.

[6] Wang Zhiyue(2020).Survey of Intelligent Question Answering Research Based on Knowledge Graph .J. Computer Engineering and Applications.1.

[7] Xi Jinping(2020). ideological and political courses is the key course to implement the fundamental

task of Building Morality and cultivating people.N.Qiushi. 17,4-16.

[8] Yan Yiqiao(2021).There are more than 127000 full-time and part-time teachers of ideological and political courses in Colleges and universities.N.13.

[9] Zhao Guoqing, Li Xinyuan, Peng Qingqing,(2021),From Cognitive graph to Cognitive Graph: An Interdisciplinary Concept Discrimination.J.Modern Distance Education Research.33,5.