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Mining and Teaching Practice of Ideological and Political Course Elements Based on Text Extraction and Knowledge Graph

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Abstract: With the rapid development of the country's economy, politics, and culture, China has swiftly ascended to the ranks of global powers. Its participation in international organizations, including the WTO, has significantly bolstered its global standing and diplomatic ties, making it an indispensable player in international politics. Meanwhile, domestically, China has implemented numerous initiatives aimed at improving the lives of its citizens, such as anti-corruption campaigns, efforts to uphold integrity, crackdowns on criminal organizations, and poverty alleviation programs. As a result, the well-being of the populace has seen a steady increase. Furthermore, China has embarked on a new era of education characterized by its unique attributes, with civic education platforms experiencing comprehensive development. This paper examines these developments through text and knowledge mapping, assessing the efficacy of this approach within the framework of course ideology and politics.

Keywords: Course ideology and politics, Text extraction, Knowledge map, College civil engineering

1. Introduction

Universities play a pivotal role in education, with ideological and political courses being fundamental components of higher education curricula. Through concerted efforts by various local universities, the implementation of the "Three Comprehensive Education" initiative has demonstrated vitality, ushering in a new era [1–3]. Universities must prioritize moral development and character cultivation as the cornerstone of student life, establishing robust systems for comprehensive education. This entails shouldering the responsibility of nurturing socialist contributors and embracing the sacred mission of grooming future leaders.

The cultivation of talent among college students is imperative, as the future belongs to today's youth. The strength of our nation hinges on the vigor of its youth, which is fostered primarily through education. The primary objective of education lies in fostering virtue and nurturing individuals [4,5].

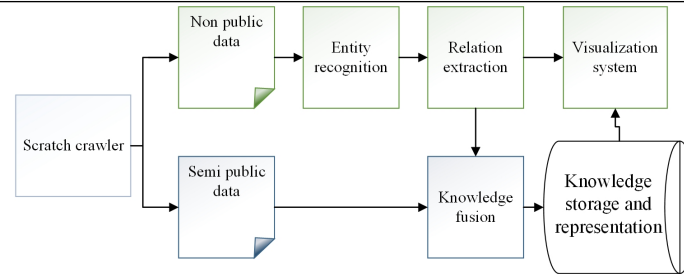


Figure 1. Overall Structure Diagram

As we transition towards a learning society, the education system must evolve towards lifelong learning, continually improving to better serve the populace [6, 7]. Upholding Marx’s guiding principles is paramount, ensuring steadfastness in our educational direction while remaining open to innovation and reform.

Education is intrinsically linked to the welfare of the people; thus, educational offerings must cater to their needs. General Secretary Xi Jinping has outlined three key objectives for educational training. Firstly, instilling students with lofty ideals and aspirations, aligned with the vision of advancing towards communism in the new era of socialism, instilling confidence in the nation and the leadership of the Chinese Communist Party [8]. Secondly, fostering patriotism, emphasizing love for the motherland and prioritizing its interests above all else, with a commitment to its prosperity and bright future [9]. Lastly, promoting personal moral development, guiding students to embrace lofty ideals and persevere in their pursuits. This study focuses on civic education among students in educational institutions [10].

2. Methods

In this paper, the overall process of the mining and research on the civic elements of the curriculum is as shown in Figure 1.

2.1. The Theoretical Architecture by Text Extraction and Its Implementation Path

In the mobile learning era, the paradigm of learning freedom has transitioned to a highly efficient 4A mode: “anyone, any time, any place, any style.” In this context, “knowledge graph-driven” refers to a modern foreign language teaching digital system facilitated by smartphone applications. This system integrates MDX format offline thesauri, bilingual parallel corpora, digital books, and online audio-video resources, supported by both classroom-based and WeChat public account platforms.

From the perspective of language learning resources, the digital drive relies heavily on MDX format thesaurus groups compatible with software such as Mdict, GoldenDict, Deep Blue Dictionary, and Oulu Dictionary. Originating in 2002, dictionary software capable of reading MDX format files, as described by Baidu Encyclopedia and Maestro, revolutionized access to various MDX format dictionary files.

Presently, the author has amassed expertise in approximately 100 MDX format databases spanning diverse fields such as civil engineering, dictionaries, and encyclopedias, marking a pioneering endeavor in terms of functionality and thesaurus categorization. However, dictionaries and encyclopedia databases represent only a fraction of our digital drive’s capabilities. It encompasses multimodal resources, self-built corpora, and online new media platforms.

Efforts have been made to integrate the digital drive into the theoretical framework (see Figure 2), bridging the gap between online and offline realms, input and output modalities. The situational language output task serves as the cognitive driver, with selective input serving as content and short-term, high-quality output as the ultimate objective.

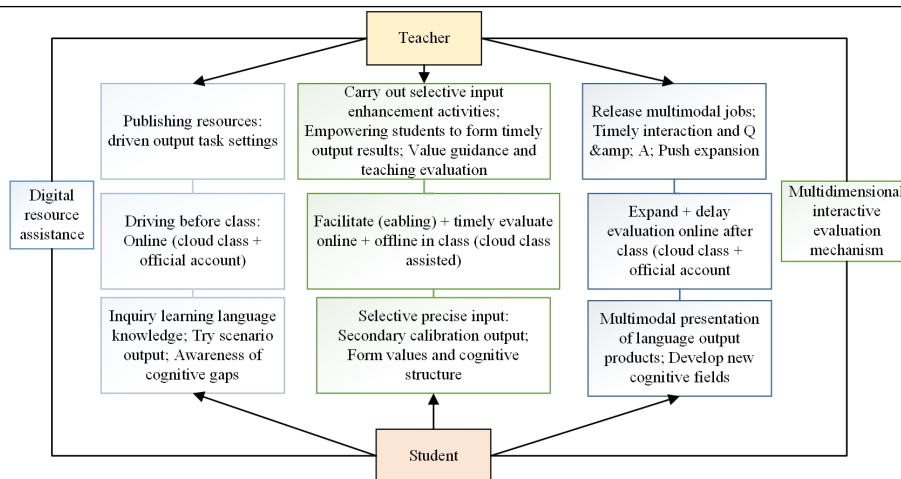


Figure 2. Teaching Mode Driven by Text Extraction

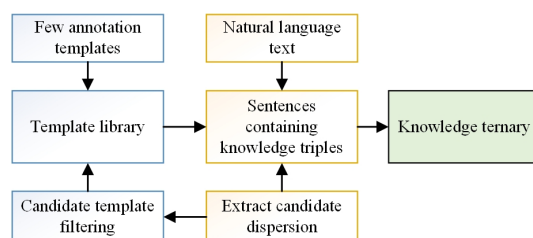


Figure 3. The Specific Process of Relation Extraction Based on Semi-Supervised Method

2.2. Entity Relationship Extraction in the Civic Field

Due to the lack of structured data in the civic field, this research mainly uses unstructured data and semi-structured data related to ideology and politics as relation extraction corpus. Among them, the semi-structured data is mainly the information box data of civic figures, government affairs organizations and political conference entries in Chinese encyclopedia webpages, mainly using crawler technology to extract relation triples. As shown in Figure 3, unstructured data is civic-related plain text data obtained from websites such as "Learning to Strengthen the Country", "Chinese Communist Party", "Zhong gong Education Current Affairs Channel", etc. This part of data mainly uses syntactic dependency technology to obtain ternary silk of civic relations [11, 12].

2.3. Relation Extraction from Unstructured Data

Given the unique nature of civic texts and the absence of expert-defined ontology structures, this study employs open relationship extraction and Dependency Parsing Analysis (DPA) to extract relationships from preprocessed civic texts.

2.3.1. Dependency Syntax Analysis

The primary purpose of DPA is to deconstruct the target sentence, thereby identifying the dependencies among words within the sentence and subsequently capturing the logical semantics of the entire sentence. In contrast to the surface-level features of vocabulary, syntactic analysis dissects sentences into components such as "subject" and "object," leveraging Chinese grammar to uncover word dependencies and reveal deeper sentence information. This approach enables more precise expression of semantic relationships inherent in the sentence [13, 14].

Currently, domestic research on syntactic analysis has yielded notable achievements, with a succession of related studies emerging. The Language Technology Platform (LTP) developed by Harbin Institute of Technology is a prominent Chinese language processing system widely utilized in various Chinese computational linguistics endeavors. Featuring robust and efficient Chinese sentence process-

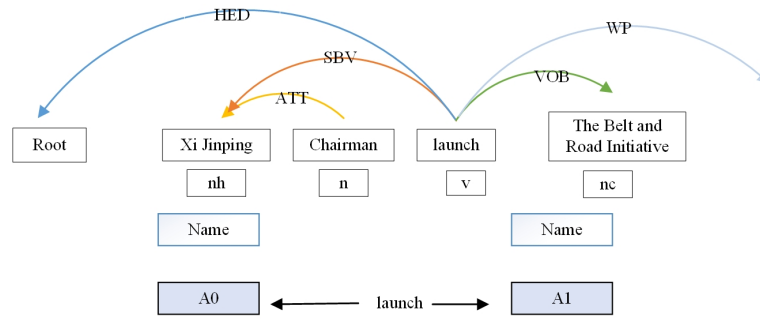


Figure 4. Example of the Result of the Syntactic Analysis of the Sentence

Dependency	Character representation	Dependency	Character representation
State to state relationship	ADV	China relations	ATT
S-v relation	SBV	Core relationship	HED
Juxtaposition relation	C00	Intermediary object relationship	POB
Concurrent language	DBL	verb-object combination	VOB
Inter object relationship	IOB	preposed object	FOB
Independent structure	IS	Dynamic complement relationship	CMP

Table 1. Given Data set Format

ing modules, the platform has undergone a decade of development to provide a suite of bottom-up natural language processing modules, application programming interfaces, visualization tools, and more. In this experiment, we primarily leverage the lexical analysis, syntactic analysis, semantic analysis, and other modules offered by LTP. Utilizing the LTP tool for sentence analysis yields results as depicted in Figure 4. When a sentence undergoes syntactic analysis using LTP, it first undergoes segmentation. In this example, the sentence is segmented into five words: "Xi Jinping," "President," "Initiated," and "One Belt One Road."

After the word segmentation, each word is marked with part of speech. For example, the word "Xi Jinping" is marked as "1111" as the person's name. Finally, the dependencies between words are determined according to the parts of speech of the words in the sentence, such as the words connected by curved arrows in the figure. In this example, the word "initiating" and the word "Belt and Road" are divided into "VOB" relationships, and after syntactic analysis It can be known that "initiating" is the core verb of the sentence, which governs the entire sentence. The sentence has a subject-predicate relationship. According to the relationship pattern matching of LTP, the knowledge triplet "Xi Jinping, initiated, the Belt and Road" can be obtained for this sentence [15]. In the LTP Syntax Dependency Tool, a total of fourteen accessible relations are defined and annotated as shown in Table 1.

2.3.2. Unstructured Data Relationship Acquisition Process

In this link, the civic sentences containing multiple entities in the entity recognition process are firstly screened, and then the natural language processing module of LTP is used to process them accordingly, and finally the relationship between entities is obtained by the method of dependency syntax analysis. The process of obtaining unstructured data relationship is shown in Figure 5.

Specific steps are as shown in Algorithm 1.

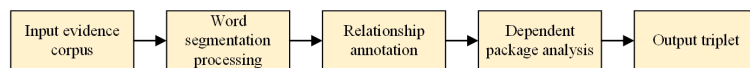


Figure 5. Unstructured Data Relationship Extraction Process

Algorithm 1 Proposed Method Process

Input: Input the civic corpus containing multiple entities into the LTP system, and call its word segmentation module to segment the civic corpus.

- 1: According to the 14 kinds of relationship patterns that have been marked, pattern matching is performed on the words that have been segmented, and the dependencies between the words are determined.
- 2: Invoke the syntactic analysis module in LTP to process the sentences marked with part-of-speech and dependencies in the second step to extract the civic triples that meet the actual needs.
- 3: Output the civic triples.

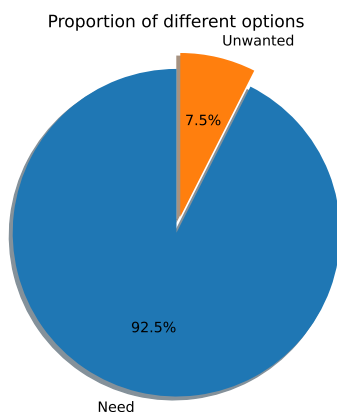


Figure 6. The Results of Question 4

3. Case study

As a university student, it is very important to master a skill, but learning to be a person is even more urgent. The so-called Lide and cultivate people, establish noble morality, and be a person with correct "three views". Helping young students who have just entered the university campus to establish the correct "three views" is not only the responsibility of college civic course teachers and college counselors, but also the responsibility of all subject teachers in universities [16].

In the process of collecting materials, this paper designed a questionnaire entitled "Civic Education in civil Engineering in Universities". A total of 175 people participated in the survey, all of whom were university students. Among them, there are 65 boys and 110 girls. Question 4 "Do you think it is necessary to receive civic education in other ways besides the civic courses in the university?" 162 students think it is necessary, accounting for 92.54%, and 13 students think it is not necessary, accounting for 7.46%, it can be seen that , more than 90% of the students believe that they need to accept other ways of civic education. Question 5 "Do you think teachers should give civic education to students in college civil engineering classes?" 158 students thought they should, accounting for 90.24%, and only 17 students thought they should not, accounting for 9.76%. Therefore, most students still think that they should be civic education in civil engineering class, and they also realize the importance of civic education. Question 6 "Do you want to receive civic education in college civil engineering class?" 154 students answered "hope", accounting for 89%, and 21 students answered "no hope". Judging from the survey results, there are still many students who hope to receive civic education in course ideology and politics classrooms [17, 18]. Question 4 "Do you think it is necessary to receive civic education in other ways besides the civic courses in the university?" [Multiple choice] The answer is shown in Figure 6. Question 5 "Do you think teachers in college course ideology and politics classes should give civic education to students?" [Multiple choice] See Figure 7 for the answers. Question 6 "Do you want to receive civic education in college course ideology and politics class?" [Multiple choice] The answer is shown in Table 2.

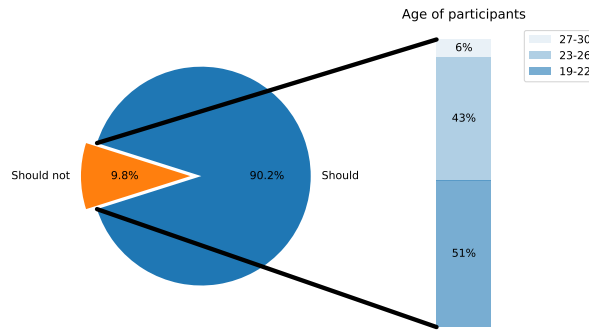


Figure 7. The Results of Question 5

Option	Subtotal	Proportion
Hope	156	89%
Don't hope	19	11%
Number of valid filling in this question	175	

Table 2. The Results of Question 6

Western culture ignores excellent traditional cultural education. Taking the ideology and politics textbook currently used by a college as an example, it adopts the "New Comprehensive Course of Practical course ideology and politics (Fifth Edition) 1", which is aimed at the "Tenth Five-Year" and "Eleventh Five-Year" general education countries for college course ideology and politics [19, 20]. Planning textbooks and the "Twelfth Five-Year Plan" national planning textbooks for vocational education. Although this set of textbooks further highlights the cultivation of course ideology and politics communication skills in the workplace, and also adds the link of "appreciating Chinese culture", it is not difficult to find that out of the 16 readings in the textbook, 9 of them are Western culture, accounting for 62.5% ; 3 articles on Chinese culture, accounting for 6.25%; 4 articles on common culture, accounting for 3.125% as shown in Table 3.

This paper takes the College course ideology and politics textbook (21st Century College course ideology and politics (applied comprehensive course) used by liberal arts students. Each volume of the textbook contains eight units [21]. The topics of the units include life value, artificial intelligence, Chinese and western educational concepts, cultural diversity, animal protection, sports, volunteer service, cultural values and other categories. The elements of "Curriculum Ideology and politics" are sorted out as shown in Table 4.

3.1. Experimental Corpus Selection

The original text of this experimental corpus is the civic related information obtained from the abstract information of "Learning to strengthen the country", "Chinese Communist Party", "Zhong gong Education Current Affairs Channel" and Baidu Encyclopedia civic entries by using crawler technology combined with regular expressions. Plain text unstructured data. A total of 1,421 civic texts were obtained, and the sentences were split into sentences, and sentences with relatively high civic information were selected. Finally, 1,500 sentences with a single sentence length of no more than 25 words were selected as the extraction corpus for experiments. To prevent the deviation of

Source	Number of articles	Proportion
Western culture	9	62.5%
Chinese culture	3	18.75%
Common	4	25%

Table 3. Comparison of Different Cultural Participation

Unit name	Unit	theme	Ideological and political integration point
Unit 1		College Life	Guide students to clarify their life goals, significance and values.
Unit 2		Love	Love is not selfish, self-centered, narrow-minded love, but an emotional expression existing in the social context - breaking through small love and interpreting big love.
Unit 3		Human Artificial telligence	Enable students to grasp the trend of the development of modern AI technology in China, and enhance students' sense of national pride and belonging.
Unit 4		Education	Dialectical thinking of the differences and root causes between Chinese and Western family education ideas; In discussing the inheritance and changes of Chinese traditional family education ideas, cultivate students' cultural confidence and feelings of home and country.
Unit 5		Success	Make students understand the true meaning and connotation of success, guide students to pursue their dreams, and establish a positive attitude towards life and values.

Table 4. Integration Points of "Curriculum Ideology and Politics" in Volume 1 of 21st Century College Course Ideology and Politics

Group name	Recall	F1 value
Group A	86.97%	86.12%
Group B	87.74%	88.68%
Group C	87.21%	86.85%

Table 5. Statistics of Relationship Extraction Results

experimental results caused by only one experiment, the selected 1500 experimental corpus were divided into three groups A, B and C for experiments and comparisons. Each group had 500 corpora. The number of entity relationship triples contained in each group is: 457 in group A, 463 in group B, and 432 in group C. Finally, put the civic entity composition dictionary obtained in the previous section into the LTP tool, so that it can obtain the civic entity relationship in a targeted manner [22].

3.2. Experimental Environment

The machine environment is the same as the experimental part of entity recognition, and the LTP model adopts version 3.4.2.

3.3. Evaluation Mechanism

The evaluation indicators used in this experiment are the same as those used in civic entity recognition, and are still three common indicators (accuracy, recall and F1) in natural language processing.

3.4. Experimental Results and Analysis

In the same experimental environment and computer configuration, the experiment of acquiring the civic entity relationship of the three groups of corpora A, B, and C was completed. The statistics of the experimental results are shown in Table 5 and Figure 8.

From Table 5 and Figure 8, group B are the highest, and the percentage difference of the three evaluation indicators of groups A, B, and C is also within 5%, and the small gap can be considered as an experiment. due to differences in the corpus. Overall, the indicators of the three groups of experiments are all high. It can be considered that in the case of high-quality civic corpus and limited entities, it is feasible to use the dependency syntax analysis method to obtain the relationship between civic entities [4, 5]. Therefore, this project We also choose to use syntactic analysis to extract relational triples from the remaining civic sentences. However, it can be seen from the output

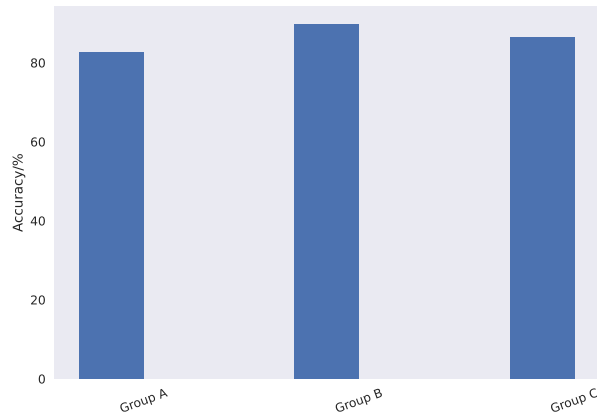


Figure 8. The Accuracy of Different Groups

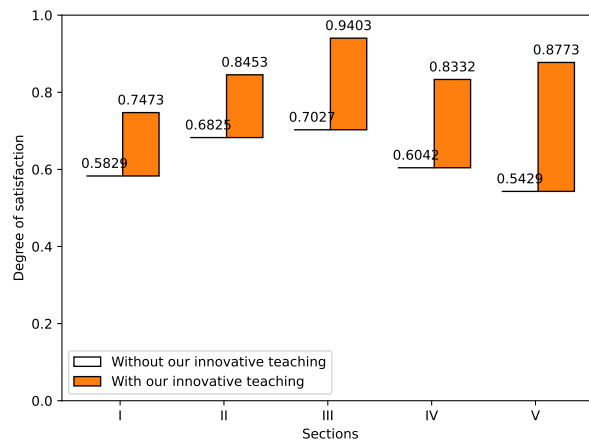


Figure 9. Comparison in Students' Satisfaction with the Course Chapters

data that due to inaccurate or incomplete positioning of some of the relationships obtained by relying on legal analysis, the output triples need to be cleaned and screened before they can be used for the construction of an civic knowledge map.

Further, we have explored the changes in students' satisfaction with our curriculum innovation research in different chapters after the ideological and political elements of the curriculum have been mined and applied to the actual college ideology and politics courses. The specific results are shown in Figure 9, it can be seen that our innovative teaching practice has this significant help.

4. Conclusions

The development of civic curriculum requires teachers to deeply study the civic elements in the curriculum in order to find the entry point and require students to accept moral education. We must be cautious and shrewd in using civic elements, which also requires teachers. Teachers must have high civic quality to be superior to others A civic element can be found more or less in every unit of the existing textbooks. Of course, some courses may not be suitable for teaching students the basic knowledge of civics. Therefore, ideology and politics teachers should get this degree. If the nationality elements contained in the course are not completely consistent with the course content, it should not become a compulsory course for students. This will lead to the disconnection between curriculum and civic education. The teaching of civic education is not well integrated into the curriculum, so rigid education cannot play its due role. Therefore, there is a long way to go to find and explore the elements of civic consciousness in the curriculum.

Funding

This research was supported by Guangxi First-class Discipline Statistics Construction.

Conflict of Interest

The authors declare no conflict of interests.

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