Research on the Competency Structure of Ideological and Political Teachers in Higher Vocational Colleges--An Empirical Analysis Based on Web Crawling Technology

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Abstract. By retrieving information from self-media platforms such as Baidu through crawling techniques, this study focuses on the enhancement of the competency of ideological and political teachers in higher vocational colleges, aiming to distill the key elements that influences the competency of ideological and political teachers in higher vocational colleges with grounded theory, which is in order to strengthen the construction of higher vocational ideological and political teachers. It has been found that political literacy(which consists of political belief and political sensitivity), professional identity(which consists of professional responsibility, professional interest and professional development), theoretical proficiency(which consists of theoretical depth and breadth of knowledge), teaching ability(which consists of educational ideas, teaching methods and language arts), and personal traits(which consists of moral cultivation and adaptability) constitute the primary components of competence among ideological and political teachers. The findings of the study can provide essential insights for the selection, training, and assessment processes of ideological and political teachers in higher vocational colleges.

Key words. Higher Vocational Colleges, Ideological and Political Teachers, Competency, Web Crawling Technology

1. Introduction

In September 2018, General Secretary Xi Jinping pointed out at the National Education Conference that "ideological and political education work is the lifeline of all work in

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schools"[1], underscoring the pivotal role of ideological and political education. In March 2019, President Xi emphasized again at a symposium for teachers of ideological and political theory courses in schools that "the key to running ideological and political theory courses well lies with the teachers"[2]. Teachers of ideological and political courses play a crucial role in implementing the fundamental task of fostering moral integrity and nurturing a new generation of capable young people who can shoulder the great responsibility of national rejuvenation. The competence and quality of these instructors directly impact the effectiveness of ideological and political courses. Therefore, establishing a highly qualified team of ideological and political teachers is a key step in effectively implementing ideological and political education.

Competency refers to the practical and potential characteristics that individuals should possess when undertaking specific roles or positions[3]. Exploring the enhancement path of human capital from the perspective of competency has become an important research approach in fields such as management and education in recent years. For ideological and political education teachers in vocational college, the students they face have relatively poor learning abilities, lower comprehensive quality, and sometimes biased values. Moreover, due to the prominent "vocational attributes" of these colleges, students generally pay little attention to ideological and political education. Thus, to some extent, vocational college ideological and political teachers are faced with more complex student situations, greater teaching difficulties, and require a more diverse and distinctive set of competencies to fulfill their job requirements.

By combing the relevant literatures, we can find that the research on the competence of ideological and political education teachers in vocational college is woefully inadequate both domestically and internationally. Therefore, this paper will take self-media platforms as the source of empirical materials and search for textual information related to the qualities and behaviors of vocational college ideological and political teachers, aiming to extract the elements of competence required for those and provide reference for the building of the ideological and political teacher workforce in vocational college to improve the quality of ideological and political education in higher vocational colleges.

2. Study design and implementation

2.1 Textual data collection

In this study, Python was used as programming method and Scrapy crawler tool was used to complete the mining task. Scrapy includes Engine, Scheduler (tuner), Downloader (underloader), Spiders (spiders), Item Pipeline (project pipe) and other modules. The specific process is as follows: First, with specific keywords, opens the specified web page by the Engine, and returns the web Uniform Resource Loeators(URL) to Scrapy; Secondly, the Engine requests the Scheduler to open the URL of the next web page and proceeds through the loop; Thirdly, Downloader accepts the URL of the web page, downloads the content of the web page, and sends it to the Engine through Downloader middlewares. In this process, the Engine sends the results of the crawler to the Item Pipeline, and the Scheduler keeps sending new tasks to the Engine until the task is completed.

This study targeted platforms such as Baidu, Zhihu, and Xiaohongshu. With web crawling technology, this study extracted textual data from above self-media platforms from January 1, 2023 to December 31, 2023, with a series of keywords such as "ideological and political", "ideological and political education", "work of ideological and political teachers", and "Marxism". In total, 126 pieces of text were collected, covering data from comments, experiences and performances.

2.2 Textual data cleaning

By observing the first draft of the text content collected by the web crawler, we could find that there was some redundancy, meaningless or even incorrect contents in the data, which would work against the extraction of Chinese word segmentation and keywords in the following step. Therefore, it was of great necessity to clean the data before the study going on. First, the researcher denoised the text content by re-screening the collected data with keywords such as "ideological and political teachers", "ideological and political education", and "Marxism" and then eliminating irrelevant cases. Second, manual intervention was applied to meticulously inspect each piece of data to remove interfering, meaningless and duplicated content, which just like that the same content appears simultaneously in different platforms, to ensure the accuracy of the text. What's more, to enhance the completeness and reliability of the data, text content with exceptionally low character count or with incomplete or even incorrect information was eliminated. After the above steps of data cleaning, 68 relevant pieces of texts which are highly relevant to the research topic are remained.

2.3 Textual data analysis

Grounded theory is a commonly used qualitative research method. Based on grounded theory, this study took textual content as the primary source of research material and tried to maximize the extraction of information regarding the competence of ideological and political teachers in vocational colleges from first-hand experiences. The grounded theory method is the process of inductive coding and relationships construction, generally divided into three steps: open coding, axial coding, and selective coding[4]. Open coding is the process of initial conceptualization of textual information. Through constant comparison and analysis, it could be identified that 28 original concepts were related to the competency characteristics of ideological and political teachers in higher vocational college, forming 12 initial categories, which is shown in Table 1. Axial coding involves further categorization of concepts from the previous step. At this stage, political belief and political sensitivity were categorized into political literacy; professional responsibility, professional development, and professional interest into professional identity; professional depth and breadth of knowledge into theoretical proficiency; educational philosophy, teaching methods, and language artistry into teaching ability; and moral cultivation and adaptability into personal traits. Selective coding refers to the extraction of core categories from the main categories, then analyzing the relationship between core categories and other categories, and summarizing various related variables into a theoretical framework in the form of a storyline. Treating the competence structure of ideological and political teachers in higher vocational colleges as the core category, four story-lines were constructed, demonstrating the relationship between main categories and the core category. That is, political literacy is the core of the competence structure of

ideological and political teachers in vocational colleges; professional identity is the guarantee of the competence structure of ideological and political teachers in higher vocational colleges; theoretical proficiency and teaching ability form the foundation of the competence structure of ideological and political teachers in higher vocational colleges; finally personal traits facilitate the competence structure of ideological and political teachers in higher vocational colleges.

Table1. Coding process

Source	Original Concepts	Initial Categories
Ideological and political teachers must always maintain a high degree of political acumen.	political acumen	political sensitivity
Ideological and political teachers should have political vigilance in order to accurately grasp the correct political direction.	political vigilance	
It is the duty of ideological and political teachers to help them establish correct values.	sense of duty	professional responsibility
It is our obligation to help students understand the world better.	obligation	

The reliability test of this study refers to the test on the "conceptual" consistency of the qualitative material by three researchers. If the classification results of the three researchers reach a certain degree of consistency, it indicates that the theoretical model constructed in this study possesses a high degree of scientific validity and objectivity.

The specific operation involves: first, independently categorizing the textual content according to the aforementioned coding categories; second, calculating the inter-rater reliability among different researchers. The formula for calculating inter-rater reliability is as follows[5]:

$$R = \frac{n*K}{1+(n-1)*K} \qquad (1)$$

In Equation (1), R represents the inter-rater reliability between coders, n is the number of participants involved in coding, and K signifies the average mutual agreement among coders. The average mutual agreement between two coders is calculated as follows:

$$KAB = \frac{2MAB}{NA+NB} \qquad (2)$$

In Equation (2), MAB represents the number of analytical units with identical coding results between the two coders, NA indicates the number of analytical units coded by coder A, and NB indicates the number of analytical units coded by coder B. Assuming the average mutual agreement between three coders pairwise is KAB、KAC、KBC, then the calculation formula for the average mutual agreement among three individuals is as follows:

$$KAB = \frac{KAB + KAC + KBC}{3} \qquad (3)$$

Substituting the data into the relevant formulas, the inter-rater reliability among the three researchers in this study is obtained as shown in Table 2:

Table2. Inter-rater reliability of coders

Primary Category	Inter-rater Reliability	Secondary Category	Inter-rater Reliability
Political Literacy	0.98	political belief	0.99
		political sensitivity	0.97
Professional Identity	0.93	professional development	0.94
		professional interest	0.92
		professional responsibility	0.91
Theoretical Proficiency	0.95	professional depth	1
		knowledge breadth	0.92
Teaching Ability	0.91	educational philosophy	0.91
		teaching methods	0.92
		language artistry	0.92
Personal Traits	0.93	moral cultivation	0.94
		adaptability	0.91

The higher the consistency of judgment among coders for the same category, the higher the credibility of content analysis. An inter-rater reliability above 0.80 is considered acceptable, and above 0.90 is considered good[6]. From Table 2, it can be observed that the retest reliability values for categories are all above 0.91, with even "Professional Depth" reaching a value of 1, indicating a high level of reliability in the coding process.

3. Analysis of results

3.1 Political literacy

Political literacy refers to the stable tendency of political qualities manifested through an individual's thoughts and actions. The ideological and political course which show a strong political attribute is different from specialized courses. Only with good political literacy can teachers achieve positive guidance on students' ideological, political and moral qualities. Vocational college ideological and political instructors serve as the guides for vocational college students' ideological development and play a crucial role in guiding them how to tie their shoelaces properly before embarking on their journey of life. Excellent political literacy is the core competence of an outstanding vocational ideology teacher. Specifically, political literacy comprises two aspects: political belief and political sensitivity.

3.1.1 Political belief

The inherent political nature of ideological and political theory courses determines that ideological and political teachers, as direct disseminators, must genuinely adhere to the principle of "practicing what you preach". As mentioned in one of texts, "ideological and political teachers must have correct political beliefs, must hold a clear political stance, and must take the right political path."

3.1.2 Political sensitivity

Political sensitivity refers to possessing insight into and the ability to resist threats to national interests, as well as accurately judging political positions and principles. Higher vocational students are at a critical stage of value shaping. They are susceptible to the influence of incorrect ideologies. Thus, only with a high level of political sensitivity, can higher vocational ideological teachers keep a clear mind at all times and help students discern different information to prevent them from going astray, as involved in the text content, "ideological and political teachers should always maintain a high degree of political sensitivity."

3.2 Professional identity

Professional identity refers to an individual's affirmative evaluation of the value and significance of their profession. When teachers have a positive professional identity, teaching becomes a significant thing, and this will provide teachers with positive and effective psychological resources so that they can work better[7]. Compared with teachers in university and secondary schools, teachers in higher vocational college face lower social recognition of their profession, which leads to a lower sense of accomplishment and expectations for students in some teachers[8], and a low desire to improve their own quality and work enthusiasm. In such a background, professional identity becomes the guarantee of the competency characteristics of higher vocational teachers, especially for those who teach non-professional technical courses, like ideological and political courses. Specifically, professional identity includes three aspects: professional responsibility, professional interest, and professional development.

3.2.1 Professional responsibility

Professional responsibility means the obligations that teachers must fulfill in their professional activities, which determines the degree of competence in teaching and educating students, as exemplified in the text, "It is our duty as an ideological and political teacher in vocational college to help students establish correct morals and values."

3.2.2 Professional interest

Professional interest is a relatively stable and long-lasting psychological tendency towards a certain occupational activity. It could enhances individuals' job satisfaction, sense of achievement, and happiness in their profession, etc., as stated in the text, "I really enjoy this job and am very satisfied with this occupation."

3.2.3 Professional development

Professional development is the performance that individuals seek development and make efforts to realize self-worth in their work positions. It is an indispensable internal driving force that motivates people to work hard. The representative sentence in text is that "Young people should strive for development. As General Secretary Xi Jinping said, striving is the most brilliant color of youth, and only through hard work can we achieve development."

3.3 Theoretical proficiency

Ideological and political course is a theoretical course with rich content and self-contained theoretical system. To teach this course well, ideological and political teachers need to have profound theoretical qualities, be familiar with the basic principles of Marxism, and be able to analyze and solve problems in ideological and political work using Marxist positions, viewpoints and methods[8].. To put it more precisely, theoretical proficiency is constituted by two aspects: professional depth and knowledge breadth.

3.3.1 Professional depth

Ideological and political course features great logic and abundant theory. Only studying Marxist classics and Xi Jinping thought on socialism with Chinese characteristics for a new era in a systematic and profound way, internalizing knowledge in mind and externalizing it in practice, can teachers impart knowledge to students in depth. Therefore, an outstanding ideological and political teacher should possess a profound understanding of Marxist theory, as is shown in the text, "I am quite familiar with the textbook and consider myself to have a thorough and comprehensive understanding of the key points. I have always been proud of myself that I rarely bring the textbook to class."

3.3.2 Knowledge breadth

An excellent ideological and political teacher in higher vocational college should also be familiar with the word, national situation as well as Party's policies. They have a certain breadth of knowledge and can provide insightful analyses of major issues in Chinese society, global development trends, and real-life challenges. For instance, "I usually integrate current hot spots into my lectures to help students have a better understanding the content."

3.4 Teaching ability

Teaching ability which is the ability of teachers to control the whole teaching process is an important manifestation of a teacher's professional competence. It is the key factor of teaching quality, so it plays an important role in the structure of teachers' ability and is the core element in the structure of teachers' ability[9]. A distinguished ideological and political teacher in higher vocational college should have strong teaching abilities, which means that he is capable of making Marxist theory, the theory of socialism with Chinese characteristics, and the Party's principles and policies fully resonate with students. Specifically, teaching ability includes three aspects: educational philosophy, teaching methods, and language artistry.

3.4.1 Educational philosophy

Most of the time, ideological and political teachers in higher vocational college face headache students from problematic families, and each of them has different issues. Hence, teachers need to have the concept of tailored-made and student-centered education. As mentioned in the text, "Vocational college students have distinct personalities, so I may use different teaching methods for different majors."

3.4.2 Teaching methods

Compared to other courses, ideological and political education courses are more abstract. One of trait that can make a teacher exceptional is his ability to utilize teaching techniques and innovate teaching forms. By improving teacher-student interactions, the teacher can transform abstract and dull theories into language that students can comprehend. As stated in the text, "I have been striving to further optimize my teaching methods, such as implementing activity-oriented teaching to enhance students' classroom experience."

3.4.3 Language artistry

Given the theoretical nature of ideological and political courses, it is crucial to use language art to convert obscure and boring theories into language that students can understand. For example, "I think the ability to interpret theories is necessary. When it comes to important knowledge, I will carefully consider how to explain it to students in a straight way."

3.5 Personal traits

The behavior, temperament, quality and even appearance of teachers have an immeasurable impact on students' study, morality and insight. Good personal traits act as catalysts for vocational college teachers to conduct ideological and political education effectively. Personal traits mainly involve two aspects, moral cultivation and adaptability.

3.5.1 Moral cultivation

"Example is better than precept." The moral cultivation of teachers has a strong demonstrative and infectious power on students. An outstanding ideological and political teacher knows how to influence and infect students with noble personality and disciplined behavior. For example, "I believe it is crucial to lead by example, especially for ideological and political education instructors. We can not say one thing and do another."

3.5.2 Adaptability

Compared with undergraduate students, vocational college students have more prominent discipline issues in class[10]. Some students contradict the teacher to show their individuality, while others show disinterest in non-professional subjects like ideological and political education by playing with their phones or dozing off in class. How to handle these classroom issues promptly, flexibly, and effectively while maintaining order and guiding students to form correct value is an important criterion for evaluating the abilities of ideological and political teachers in higher vocational college. As stated in the text, "Paying more attention to the improvement of adaptability is vital and useful. Not only can I handle students' challenges properly, but I can try to guide discussions on more sensitive social topics in class."

4. Conclusion

The study employed web crawling techniques to collect textual data from Baidu and other we-media platforms, and subsequently distilled the competency elements of vocational college ideological and political educators through coding. It was found that political literacy, professional identity, theoretical proficiency, teaching competence, and personal traits are the primary constituents of the competency structure among vocational college ideological and political teachers. Among these, political literacy, theoretical proficiency, and teaching competence emerged as the three most critical features, with political belief, professional depth, and teaching methods serving as key influencing factors.

The competency elements of ideological and political teachers in higher vocational college delineated in this study exhibit distinct characteristics. In terms of disciplinary specialization, ideological and political teachers are expected to possess higher political literacy in comparison to other educators due to the nature of their role. Meanwhile, given the theoretical feature of ideological and political courses, teachers are required to demonstrate advanced theoretical interpretation skills, necessitating not only a solid foundation in professional knowledge but also broad knowledge and effective communication skills. Regarding education levels, the vocational education sector faces relatively low societal recognition, thus the professional identity of vocational teachers significantly impacts their initiative and enthusiasm for work. Moreover, vocational college students, known for "three-poor" characteristics--poor study habits, poor behavior patterns, and poor psychological quality[11], exhibit more disturbing behaviors in class compared to undergraduates. Hence, teachers are required to possess strong adaptability to maintain the classroom order effectively.

The application of the competency structure of vocational teachers can be realized in following three aspects. First, it can enhance the effectiveness of selection processes for vocational ideological and political teachers. Second, it can improve the targeting of training programs for these educators. Additionally, it can be applied in the assessment of ideological and political teachers in higher vocational colleges to enhance the fairness and rationality of performance evaluation.

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