

Chinese Culture Integrated into the Science and Engineering Courses

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Abstract: China's excellent traditional culture has a history of thousands of years, which may influence the students' thinking and behavior, therefore, it will be good if the China's excellent traditional culture is integrated into the teaching. In this paper, the problems that are faced following the integration of "Numerical Calculation Methods" course with the China's traditional culture, and ideological and political into teaching, were analyzed. Further, the strategy and specific implementation plan for the integration of traditional culture, ideological and political elements with the numerical calculation methods course was proposed. This provides a new platform, and experiences following the integration of basic mathematics courses in colleges and universities with curriculum traditional culture, ideological and political education.

Keywords: Traditional culture; Ideological and political education; Cultural confidence; Science and engineering

Online publication: June 20, 2022

1. Introduction

The Chinese nation of "The country will be prosperous and strong, if the culture is prosperous and strong, quoted from the text of "Cultural confidence is the most basic, deepest and most lasting force in the development of a country and a nation". During the integration or incorporation of ideological and political education in the colleges and universities, it is essential to discuss on the implementation of the Chinese traditional culture into the curriculum^[1,2], not only as a part of the education requirement^[3-5], but also for the traditional culture to actively adapt to the current development^[6,7]. The curriculum content of the ideological and political education, can be used to measure the strengthen of the education system among the college students, further can be used as a source to promote the reform of curriculum teaching, and to implement the fundamental of moral education^[8,9]. The curriculum content of the ideological and political education, including the moral education can be implemented into various curriculum teaching^[10-12], complement with the Chinese nation saying of "each course is the basis of ideological and political education^[13]."

2. The important of integrating Chinese culture into the ideological and political construction of science and engineering courses

The science and engineering course shoulder an important mission of the society, in creating qualified scientific and technical talents in the country, to promote the sustainable development of the economy and

society, and realizing the overall development strategy for the country^[14-16]. In the university education, the teaching should not only focus on the theoretical knowledge and subject practice content, but the influence of the educational system on the college students' values and ideology, should also be given priority^[17]. Therefore, the teaching of science and engineering courses should not be limited to the content knowledge, such as a single theory or experiment, but also include the country's overall educational development goals and educational reform plans, such as social value, national will, and the strategic plan^[18-20]. This will enable the students to master the knowledge of the courses, as well transform the knowledge into patriotic feelings and scientific research spirit awareness.

Next, to integrate the Chinese culture as a part of the curriculum ideology and politics, is a challenging issue that need be tackled urgently, especially in the science and engineering higher education system. In this paper, "Mathematical Physics Equations" course was selected as an example of the science and engineering course, to discuss the integration of cultural elements in the course of ideology and politics. Further, to integrate the science education and cultural education, focus was given on condensing cultural heritage as a part of the ideological and political elements in the teaching of university science and engineering courses. This paper recommends the ideological and political teaching mode of science and engineering courses, further constructs a curriculum ideological and political teaching mode that can be effectively combined with the science and engineering courses with the traditional excellent culture. The implementation of curriculum ideology and politics may provide subtle effect on the formation of students' correct values, lastly achieves the expected teaching effect.

3. The focus of integrating traditional culture into curriculum ideology and politics

3.1. The inheritance of patriotism

The patriotic spirit of the traditional culture runs through the history of the nation, symbolizing the national spirit and the spiritual focus of the nation. In the long history of the nation, countless inspiring figures have written stories based on the strong national feelings with patriotic enthusiasm. Numerous patriotic and loyal people are concerned about the country and the people, which fully demonstrate the sense of mission and responsibility, with full of ardent expectations for the country, the nation, and the people. This simple patriotic spirit has condensed into a national centripetal force, and when this spirit applied into the science and engineering courses, the ideology and politics education may extend to the scientific research spirit of science and technology power, and further build the dedication in the students.

3.2. The quality of self-improvement

The Chinese nation of "The movement of heaven is full of power, makes oneself strong and untiring" has always emphasized the positive and enterprising, act as the main cultural thought out the country, and also serves as a spiritual pillar. The cultural spirit of self-improvement and continuous improvement has gradually become a fine tradition after the continuous precipitation, thereby forming the inherent character of the nation. This clear spiritual context is an important quality that should present in all the college students, and a spirit that all the educators should have in them, which can help to inspire and concentrate on the research, as well contain the scientific research spirit to climb the peak of science and technology, in the future scientific research and technical work.

3.3. Seek truth from facts, and establish a scientific view of righteousness and interests

In traditional Chinese culture, the Confucian view of righteousness and benefit pays attention to "Leading benefit with righteousness," where, pursuing profit, one should emphasize the leading role and status of

righteousness. As the main position of cultivating college students, the pursuit of scientific research results is ubiquitous. As an individual, it is necessary to control the benefits oriented by technology and scientific research results, in contrast, to promote the correct concept of justice and benefit.

4. The methods of integrating excellent traditional culture into the ideology and politics of science and engineering courses

4.1. Excavate the ideological and political elements of the curriculum deeply

The ideological and political elements of Chinese excellent traditional culture content should be fully explored. During the teaching process, knowledge points should be reasonably classified and sorted as science and engineering courses, which is responsible in creating a professional. For example, there are many formulas that need to be deduced, memorized, and understand in the course of “Mathematical Physics Equations”, at the period the student should be encouraged to study the rationale, and understand the foundation of the equation, and not only to memorize the equations. The accumulation of basic knowledge requires the so-called “no accumulation, no step, and even a thousand miles”. Students should develop a good learning habit, such as, learning must be down-to-earth, starting from bit by bit, and do well at small things. Studying the basic principles, can help in the professional point of view of “Mathematical Physics Equations”, further, China has brilliant scientific achievements since the ancient times, therefore it is important to study, and understand the basic principles. Focusing on this, the teacher can quote philosophical thoughts such as “Tao is an objective existence and the origin of the universe” in “Zhuang zi” when explaining about “ill-posed solutions or chaotic phenomena”, by including the basic philosophical theories such as three things and others. The highly representative Chinese historical and cultural achievements, can help the student to express their patriotic feelings, at the same time enhance their cultural self-confidence. In addition, can also stimulate the students’ assiduous spirit of seeking knowledge, provide students with a firm motivation to study, and enhance the realization of national greatness.

4.2. Strengthen online teaching, improve teaching design and methods

Science and engineering subjects have limited teaching and learning hours, therefore, class time is extremely limited. To ensure that the theoretical and the ideological and political teaching tasks of the course can be completed, it is essential to reasonably coordinate and plan the teaching tasks. Teachers need to focus, and innovate teaching method contained a reasonable integration of cultural elements into the curriculum ideology and politics, by adopting the teaching method of “point to face” to ensure a good teaching effect. For the teaching in the classroom, teachers should prepare ideological and political elements and the course cases carefully, by combining the knowledge structure, and the points distribution that is involved in this course. Teachers should focus and innovate teaching plan and design carefully, and use various teaching methods such as lectures, project introduction, and inspiration in the classroom. Generally, integrating the ideological and political elements of the curriculum into classroom teaching, should avoid rigid, monotonous, boring, and far-fetched situations, and should focus on the natural and continuous effects of the curriculum ideological and political. The whole teaching, should adopt the BOPPPS teaching method. In the terms of using props during the offline teaching process, the ideological and political elements of the course can be displayed in the form of micro-movies, animations, teaching aids, meanwhile, the theoretical content can demonstrate in the form of on-site explanations, and power-point presentations. The online teaching method, should adopt a teaching mode that can complement the offline teaching. There are few advantages of online teaching, where the teacher can utilize the existing online high-quality teaching resources, and also may records the online teaching resources according to various theoretical points. Since

online resources are not limited by classroom teaching time, student subjects can be replayed repeated as needed, which can play a good supplementary role during the offline teaching.

4.3. The improvement of teachers owns cultural literacy, drive a charming cultural classroom

The ideological and political integration of traditional excellent culture courses puts forward higher requirements for the teachers of various professional courses, to improve their human ideological quality, while improving their professional quality. Teachers' personal cultural literacy, will show their classroom teaching charm to a greater extent, further, improve the classroom teaching effect. Therefore, the construction of curriculum ideology and politics also urges teachers of science and engineering majors to further strengthen the cultural learning, and strive to improve their cultural literacy. During teaching the Chinese excellent traditional culture, and curriculum ideology and politics, the teacher should combine their own experience during the teaching process. The teaching process should avoid the imitation of the ideological and political elements, therefore, it is better to combine the unique cultural charm, and combines theory with practice effectively.

4.4. Use the romantic features of Chinese culture reasonably

To introduce the excellent traditional culture of the Chinese nation into the ideology and politics of the curriculum, teachers should have deep knowledge of the culture, and at the same time feel the Chinese culture attentively. The excellent traditional culture of the Chinese nation has been embedded in the people's mind, national context, and the spiritual lifeline of the Chinese nation, and is the source of the national spirit. There are not only the ancients' thinking about the world and the laws of nature, but interest in questioning the various natural phenomena, meanwhile the ancient's monologues with themselves. During the Western Zhou Dynasty, people interpreted the laws of nature with a romantic phrase from the Book of Songs, "The weather is getting cooler in July, and clothes are given in September." Meanwhile, during the Spring, Autumn, and the Warring States Period, in the cold and autumn season, Lao Tzu looked into the sky and thought, "Only the Tao is the source of all things in the world, and the Tao produces one and life two, two begets three, and three beget all things", describe from a philosophical level, further, reveals that the universal law of all things in the universe, and the natural law of Taoism and mutual growth. Li Bai, a poet of the Tang Dynasty, perfectly integrated the objective law of changing with time with his poems of "From the walls of Baidi high in the coloured dawn to Jiangling by night-fall is three hundred miles." In additional, Su Shi in the Song Dynasty traveled far away from rivers and lakes, looking at mountains, waters and life, and write a poem with the title of "Lands and peaks on the horizontal side, with different heights and heights" alludes to the machine of the universe, and the wonder of time and space, and is the earliest enlightenment to the concept of time and space. The modern romantic poet Mao Zedong interpreted the Chinese imagination of the universe with his spatial imagination of "walking 80,000 miles a day, surveying the sky and watching a thousand rivers", which is a very good course ideological and political content.

5. Conclusion

The excellent traditional Chinese culture has extremely high practical value in educating, with a valuable resource for the ideological and political development of science and engineering courses. The excellent Chinese culture should be integrated into the teaching of various science and engineering course. To achieve the integration of Chinese excellent traditional culture, and the ideological and political elements of college

courses, it is essential to stimulate the students' national spirit and cultural confidence. The best guidance, example, and good practice, will make huge effect on stimulating the students' national spirit, and further cultivating students' cultural confidence.

Funding

The Shandong Province Undergraduate Teaching Reform Research Project (Project Number: Z2021143, M2020151), and Special bidding project for online education of QLUT (Project Number:202007); Qilu University of Technology (Shandong Academy of Sciences), Educational Reform Project (Project Numbers: 2020szzx12; 2021zd10; 2020yb15,2020yb16); University-Industry Collaborative Education Program (Project Number:202102245036).

Disclosure statement

The authors declare no conflict of interest.

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