

Preliminary Exploration of Ideological and Political Construction in the Fundamentals of Testing Technology Course

Ximei Li*

Wuhan Huaxia Institute of Technology, Wuhan, China

**Corresponding author*

Keywords: Curriculum ideology and politics, discipline foundation, teaching methods, testing technology

Abstract: In order to better cultivate undergraduate applied talents with comprehensive development in morality, intelligence, physical fitness, aesthetics and labor. The ideological and political education goal of "Fundamentals of Testing Technology" is to cultivate people with virtue, Not only teachers should carefully study the essence of ideological and political education in the curriculum, but also analyze the learning objectives and content of the curriculum, finally integrate them scientifically. In the process of learning, teachers pay attention to cultivating students' close synergy between theory and practice, and Improve students' scientific thinking and hands-on ability, and establish theoretical connections with engineering perspectives. In curriculum teaching, teachers should integrate ideological and political content, such as Made in China 2025, Industry 4.0, High-quality application technology and talents with practical ability and innovative awareness are trained. At the same time, teachers should design teaching cases that can carry out ideological and political education, also excavate and extract the ideological education functions contained in these teaching cases, and then summarize and form systematic teaching materials. In a word, character cultivation is integrated into professional teaching, which is a win-win behavior. In this way, not only students' abilities and qualities are cultivated, but also students' recognition and participation in professional learning can be enhanced.

1. Introduction

"Fundamentals of Testing Technology" is a platform course and discipline foundation course for various majors in mechanical categories. In order to analyze, control and change the research object, testing technology is an important means of obtaining information, testing technology is also the core and cornerstone of intelligent manufacturing. In the surging wave of the fourth industrial revolution, the application of big data, cloud computing, artificial intelligence and other technologies have been deeply applied in the manufacturing industry, human society has entered a new stage of "intelligent manufacturing". The core premise of artificial intelligence, big data and other technologies is a large amount of reliable data, if you want to get a lot of accurate and reliable

data related to the manufacturing sector, it is necessary to have expertise in engineering testing technology, sensing technology and other disciplines.

How to fully explore the ideological and political elements in professional courses, Ideological education is integrated into the curriculum, Ideological education is integrated into the curriculum, all these problems and develop solutions are need to be thought carefully.

2. Course Characteristics and Ideological and Political Connotations of "Fundamentals of Testing Technology"

The method of specific analysis of the signal is in the time domain or frequency domain, non-electrical measurement technology in mechanical engineering and other testing techniques in mechanical engineering are included in this course. Mechanical testing technology is an indispensable and important technical means for industrial production and scientific research. It is also to adapt to the needs of mechanical creation informatization. Through the teaching objectives of the course, Students are able to analyze the technical requirements of test subjects for specific test tasks, Then they design or select each aspect of the test system according to their technical requirements, Finally, they combine all aspects of the designed or selected test system to form a test system, It also needs to be technically and economically analysed so that the test system and combination system designed or selected not only meet the test performance requirements, but also be economical.

The course is very practical, if you can explore the ideological and political connotation of the course, and you can skillfully integrate it with professional knowledge, In the long run, It will lay a solid foundation for cultivating applied and technical talents with all-round development of moral, intellectual, physical, aesthetic and labor. For example, it focuses on cultivating students' scientific thinking ability and practical ability that closely combines theory and practice, an engineering perspective that combines theory with practice are established. For the Fundamentals of Testing Technology course, it is based on the premise of following the law of student growth and the law of professional course teaching. Based on the achievement-oriented concept of engineering education certification, find the integration point between ideological and political education, curriculum teaching, these are the ideological and political connotations of the curriculum. It is necessary to use the right value orientation and professional knowledge to guide students' growth. Students become advanced applied technical talents that they have correct values, sense of social responsibility, creativity and good scientific literacy, the pursuit of excellent quality, and carry forward the spirit of craftsmanship^[1-3].

3. Heavy Inheritance and Wide Radiation--Influence others with Good Actions and Qualities, Students will Have a spirit of Excellence

If the teaching style is good, the learning style is correct, Good teachers are not only the imparters of students' knowledge learning, but also the guides for the shaping of students' values. Teachers need to follow the teacher training concept of "Nurture yourself before teaching others", Teachers need to actively improve their professional level, update teaching content, increase teaching seminars, carry out teaching reform, optimize teaching evaluation indicators, and expand the scope of curriculum demonstration. Teachers must provide quality teaching content, advanced experimental design, and good learning experience in the classroom, students are taught through the teacher's words and deeds. In the process of teacher-student interaction, students are subtly cultivated with the awareness and spirit of pursuing excellence.

4. Design to Match the Ideological and Political Content of the Course with the Course Content

According to the training objectives and graduation requirements in the professional talent training plan, Teachers should sort out the elements of the curriculum, such as the knowledge points of the curriculum, the correspondence between each teaching content and the curriculum objectives, the key and difficult points of teaching, the allocation of learning hours and teaching methods. The curriculum adopts a novel teaching design model, for example, key knowledge teaching, engineering case sharing, and ideological and political elements integration. Teachers can combine key knowledge points with engineering cases,

Teachers can also implicitly integrate ideological and political elements into knowledge points, Students' engineering thinking and ability to apply professional knowledge are cultivated, under the influence of these aspects, students are educated in ideals and beliefs, patriotism, engineering ethics, and so on^[4]. Design examples about Ideological and political mapping and integration points are shown in Table 1.

Table 1: Design examples about ideological and political mapping and integration points

Ideological and political integration point	Ideological and political elements	Ideological and political cases or tasks
1 Introduction(Such as information and signals, non-electric electrical measurement method, development and application of testing technology, etc)	A good habit of loving learning, studying and thinking	Performance test cases of typical automotive parts, Typical performance test cases before the car leaves the factory, driverless cars, Application of QR codes
Signals and their descriptions	Students are good thinkers and love innovation	Traffic lights are not just a history of technology
Periodic signals and their discrete spectrum	Subject knowledge is based on a certain basic curriculum, Just like building a house requires a stable foundation	Introducing the French mathematician and physicist--Fourier
Test the basic characteristics of the system	Law-abiding, honest and trustworthy	1Some enterprises falsify environmental monitoring data, and use sensor probes to add filter paper or reduce the sensitivity to make the monitoring data meet the standard; 2 Individual unscrupulous businesses produce seven or eight scales by adjusting the sensitivity, endangering consumers
sensor	We should respect history, work hard to become stronger, and strive to catch up with and surpass advanced countries	1A brief history of sensor development 2 Almost 100% of China's high-end sensor products are imported from abroad, and key sensor technologies and products are monopolized and embargoed by foreign countries. Sensors have risen to the national strategy, and the sensor industry is an important direction for strategic emerging industries
Signal conditioning and display recording	Students are good at learning and love learning, as well as science	Celebrity Story: Wheatstone
Signal processing and analysis	Knowledge must be able to be inferred from one another, and it can also be integrated with other technologies, so that it can be formed into a new knowledge or technology	Ancient combat strategies, such as increasing troops and reducing focus, reducing troops and increasing focus

5. Exploration of the Teaching Methods of Ideological and Political Education in the Course of "Fundamentals of Testing Technology"

Because this course itself is highly theoretical, students are bored to learn them. If ideological and political education is integrated into it, it will be more difficult for students to learn it. Therefore, teachers must change their teaching ideas and teaching methods. For example, scientific knowledge is not bluntly proposed. Instead, it starts with some interesting cases in daily life engineering applications. In addition, scientific principles are revealed, students' curiosity is stimulated, so students will think about scientific phenomena and the laws of things. When teachers express the basic knowledge of testing technology, they should make the knowledge easy to

understand and illustrated, so that it is easy to open students' imagination for free exploration. In this way, the students' desire to learn is aroused in a pleasant atmosphere, and the students will actively pursue scientific knowledge, through these means, students can have sufficient knowledge reserve, and when they graduate, they can flexibly apply the knowledge that they have learned to analyze and solve various engineering problems. In short, teachers use teaching methods that meet the characteristics of the curriculum, finally the course objectives can be highlighted with the characteristics of the trinity of knowledge, ability and quality, and also play a positive role in the cultivation of students' healthy attitude to life^[5-7].

5.1 Make Good Use of Learning Platforms such as Learning Pass and Rain Classroom to Cultivate Students' Independent Thinking Spirit

Teachers can use learning platforms such as Learning Pass and Rain Classroom to publish teaching content in advance, so that students are able to prepare for class, Teachers can also keep abreast of students' previews, and teachers can teach more key and difficult knowledge when teaching in class. When teachers teach key knowledge points, they can set up some obstacles or small games for students to answer in real time or compete for answers. Or classmates can evaluate each other, and their critical thinking spirit is also cultivated. In this warm learning atmosphere, teachers can also assign broadening exercises, which can further consolidate what students have learned.

5.2 Innovate the Classroom Model to Achieve Teacher-student Interaction

Through the construction of the ideological and political case database of the course "Fundamentals of Testing Technology", teachers use a variety of novel teaching methods, such as case-based and discussion-based teaching methods, "flipped classroom", etc., and the enthusiastic interaction between teachers and students has been realized. When students' interest in learning increases, students also have the internal drive to learn, and students' professional qualities and abilities will also be improved.

5.3 Practical Teaching is Combined with Professional Norms, so that Students' Professional Qualities can be Cultivated

In the process of practical teaching, teachers should emphasize many factors to pay attention to, such as the reliability of data, rationality and completeness of experimental protocols. In repeated practice, students' professional norms in testing technology are strengthened. For the application of course knowledge in factory production or life, teachers can guide students to discover^[8-10]. Students' research interests are stimulated, perhaps students can explore the direction of development of technical expertise.

6. Reform of Curriculum Assessment and Evaluation Methods

When the teacher selects the content of the assessment, the purpose of the teacher's inspection is to check the student's achievement of the course objectives, Students' mastery of teaching content and ability to apply it should be assessed. Based on knowledge of signal analysis, test device characteristics, sensor principles, signal conditioning and processing, Teachers should focus on students' signal analysis ability, sensor application ability and actual physical quantity detection system design ability. The assessment process includes process assessment and final assessment. The process assessment includes attendance, homework, experiments, testing, group discussions,

etc. Of course, teachers should scientifically set the proportion of the two types of assessment.

7. Summary

All in all, This paper conducts a simple study on the characteristics of basic courses of testing technology, educational teaching methods, ideological and political points, and course assessment methods, also ideological and moral cultivation is cultivated in professional teaching. The Testing Technology Fundamentals course is a foundational course, it is important to integrate ideological and political elements into their teaching. While teaching the basic knowledge, at the appropriate time, moral character content such as patriotism, love of science, love of thinking etc, can be integrated into the content of the classroom. For example, when the operation of practical skills is guaranteed to meet the needs of talent training, ideological education such as craftsman spirit and family and country feelings can be integrated into the practical curriculum. Through the continuous improvement of the cultivation mechanism of ideological and moral education, the ideological realm of students will also be improved. In fact, character cultivation is integrated into professional teaching, which is a win-win behavior. In this way, not only students' abilities and qualities are cultivated, but also students' recognition and participation in professional learning can be enhanced. Teachers reform educational and teaching methods, traditional knowledge points are transmitted to students in new forms and new teaching cases, Brainstorm is formed. Curriculum reform is a win-win situation, Teachers and students continue to learn in different ways, they are keeping up with the pace of the times, and achieving the goal of teaching and learning mutually beneficial.

Acknowledgements

1) This work is supported by the curriculum system of mechanical and electrical majors from the perspective of “double first-class” construction (Project No.: 2113).

2) This work is also supported by Featured Specialty Cluster of "Quality Engineering Projects" Machinery in Wuhan Huaxia University of Technology (Project No.: 2017140).

References

- [1] Wang Xinwei, Mu Li, Fu Xiaoyun, *Ideological and Political Teaching Design of Mechanical Engineering Testing Technology Foundation Course*, *Equipment Manufacturing Technology* No. 12, 2020, 219-221.
- [2] Zhou Dashuai, Tian Huimin, Liu Yao. *Investigation on Teaching Reform of “Mechanical Engineering Testing Technology” Based on Project Type*, *Modernization of education*. No. 8, 2021: 68-71.
- [3] Wang Xinwei, Mu Li. *The Design and Implementation of the innovation Training Platform for Mechanical Engineering Test Technology Based on CDIO*, *Equipment Manufacturing Technology* No.1, 2015: 213-215.
- [4] Yu Hong, Huang Tao, Wang Junfeng, *Experimetal Teaching of Engineering Testing Technical Foundation Based on Project Case*, *Research and Exploration in Laboratory*, Vol. 27 No.2 Feb.2008.
- [5] Zhou Dashuai, Tian Huimin, Liu Yao, Guo Hao, Jiang Wei, *Investigation on Teaching Reform of “Mechanical Engineering Testing Technology” Based on Project Type*, *Education Modernization*, Vol. 53 Feb. 2021.
- [6] Wang Wenjuan, *Application of MATLAB/Simulink in the Teaching of Mechanical Engineering Testing*, *Agricultural Science & Technology and Equipment* No. 4, 2009: 52-54.
- [7] Jiang Shan, Long Yonghong, Huang Xiaofeng, *Research of Vehicle ABS Test System Based on Lab VIEW*, *Techniques of Automation & Applications*, Vol. 32 No. 8, 2013.
- [8] Huang Anyi. *Condensed features and connotation construction of mechanical and electrical major*. *Chinese Incubator*, 2016.
- [9] Li Ximei. *Study on the training mechanism of applied talents in the mode of school-enterprise cooperation based on the case study of the major of mechanical and electronic engineering*. *Asia-Pacific Education*, 2019.
- [10] Chen Yongzhu. *Discussion on the training mode of mechanical and electrical professionals in applied technology-oriented universities*. *University Education*, 2015.