

Research and practice of ideological and political construction ideas for mechatronics system application courses

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Abstract: Guided by national strategies and industry needs, and using the typical application of mechatronics systems supported by a new generation of information technology as a case, this paper actively explores the ideas of curriculum ideological and political construction, science and technology and beauty, art, culture, fashion are integrated from ancient to modern. Efforts should be made to create an ideological and political course with political attitude, ideological depth, innovation with dimension, emotion with warmth, aesthetics with height, and manufacturing with grace. Students are inspired to explore knowledge and develop their thinking, so that students can establish professional self-confidence and professional responsibility, from personal self-confidence to national self-confidence, and lay a sense of historical mission in the digital age.

1. Introduction

Many people have done a lot of research on the ideological and political aspects of the curriculum [1-10], but the combination of traditional culture and the new generation of information technology has not yet emerged. This paper focuses on this direction. Ideological and political theory and skills are cultivated in parallel, and the application of mechatronics system is the core course of mechatronics technology. Technical skills, for equipment manufacturing and other industries, are able to engage in the production and assembly of mechatronic products, the operation and maintenance of high-end mechatronics equipment, the assembly and operation of robots, the marketing and technical support of electromechanical products, and the quality management of electromechanical products. In order to compound and innovative technical skills. Efforts will be made to create a fashion course with political attitude, ideological depth, innovation with dimension, emotion with temperature, aesthetics with height and manufacturing style.

2. The direction and focus of the ideological and political construction of the course

From the past to the present, from the generation of mechatronics technology to experience the history, from the application of the mechatronics system to grasp the present, to take national rejuvenation as our responsibility, from the development of the mechatronics system application to the future. Let students complete the value shaping and big pattern transformation from loving oneself (occupation) to loving the country (made in China) and thus loving the world (global village). Cultivate "high (high level, high ideal) rich (rich skills, rich original intention) and handsome (handsome technology, handsome soul)" talents with "the world in mind and the infinite future" with hard knowledge and soft perspective.

3. Curriculum ideological and political construction goals

From the three dimensions of time, space, and soul, and from the four levels of solar terms, technology, China, and the world, to integrate the laws of growth, learning, and life into virtual reality, ground-air cooperation, digital twin, parallel time and space, through Chinese dance, Chinese poetry, Chinese characters, Chinese solar terms, reflecting Chinese fashion, Chinese technology, and Chinese self-confidence, sweeping history and technology, tradition and fashion, and achieving the beauty of the world.

4. The supply of ideological and political content of the course

An all-round and multi-form full-staff education environment with the magnificent and colorful Chinese culture is created. Remembering the history of China with the past of the mechatronics system, using the 3D printed Zhaozhou Bridge, the Shenzhou manned spaceship, the smart restaurant of the Winter Olympics and other major events to unite the Chinese knot, with the "National Vocational Education Reform Implementation Plan", "Vocational Education Quality Improvement" The Action Plan for Excellence and the Opinions on Promoting the High-Quality Development of Modern Vocational Education gathered in the heart of China, taking the opportunity of robots to dance Chinese dance and the chip industry with strong stamina to build up China's strength, and use Chinese characters and poetry to develop the Chinese soul. The most beautiful Chinese feelings with Chinese solar terms is embodied.

5. Course ideological and political teaching practice

The twenty-four solar terms are the world's intangible cultural heritage, reflecting seasons, phenological phenomena and climate change. Condensing the wisdom of the ancients, it is the crystallization of history.

Under the sky of farming, the greatest strength is the seed, and the most beautiful posture is the cultivation.

Under the sky of learning, the greatest strength is the seed of self-confidence, and the most beautiful posture is hard work.

Under the teacher's sky, the greatest strength is to give enough nutrients to the seeds, and the most beautiful posture is to keep learning and thinking and working hard.

Under the sky of education, the greatest strength is Chinese strength, and the most beautiful posture is Chinese posture.

5.1. Course ideological and political construction model

From three dimensions and multiple levels, the ideological and political training goals of promoting Chinese culture, improving technical self-confidence, and expanding international vision through this course have been determined, and the loose-leaf course teaching plan has been continuously improved to integrate Chinese solar terms of intangible cultural heritage. into classroom teaching. Through a series of scientific worldviews and methodologies, the Mechatronics System Application Course cultivates a rigorous and scientific attitude and the courage of self-reliance, so that students can feel the power of China.

5.2. Method path

The teaching of courses such as mechatronics system application can also adopt a fresh and beautiful Chinese style. Ideological and political resources are not necessarily rigid dogmas, intentional sensationalism, but also beautiful poems that move the heartstrings. They can be Chinese solar terms that are broad and subtle, and elegant Chinese characters with beautiful shapes and infinite transformations. It can be a multi-ethnic culture with Chinese characteristics that integrates multiple elements.

5.3. Improve the course content: the collision of historical classics and modern technology.

The first solar term of the new semester is Jingzhe. The rapid development of a new generation of information technology, like a spring thunder, brings us a shocking experience and insight. Big data silently sneaks into our lives, artificial intelligence frees human beings from heavy mental work, blockchain links information quickly, parallel technology connects virtual and reality, and energy storage technology solves the big problem of energy. New courses in the new semester, waiting for students to quickly enter a full learning state from a leisurely vacation, and start the spring ploughing of their academic career.

The shocking smart production lines, smart workshops, and smart factories embody the joint control of PLC, robot, vision, HMI, etc., and the rich curriculum resources, like Gu Yu, bring endless nourishment to students. Subordinates gurgling out, the sweat of debugging again and again, the application programming and debugging of mechatronics systems, cultivate skilled talents who strive for perfection.

The circular dance steps driven by stepping and servo motors, the high-speed assembly line controlled by the frequency converter, the information perception of various sensors, the graceful voice prompts, the radio frequency identification of the item barcodes, the installation and adjustment of the mechatronics system seems simple, plant Seeds, must be persistent and hard-working effort.

Heaven and earth have festivals, and four seasons have festivals. The application of mechatronics systems can be seen everywhere, such as the five-axis machining of high-end CNC machine tools , the 3D printed discoloration Chinese knots, the aviation components designed by intelligent cad/cam , and the twins of smart factories, all of which have endowed young people with the power of technology. And confident, waiting for the beautiful autumn harvest.

Through the industrial Internet, physical entities realize storage, integration, access analysis and management, and create a fully interconnected new manufacturing ecosystem. Cloud data services and applications have established the ultimate destination of data and information. Software, network and data, cloud data services and applications, promote the integration of physical systems and digital systems, create a new social cyber-physical system, and complete the winter storage of humans, machines and objects.

The four seasons are reincarnated, the twenty-four solar terms are rotated, and the starry sky moves and the seasons change year by year. The seasons are similar, but different from year to year. Technology is updated, development is changing, students are progressing, and the country is prosperous and strong.

6. Course evaluation and effectiveness

From the three dimensions of time, space, and soul, and from the four levels of solar terms, technology, China, and the world, the laws of growth, learning, and life are integrated into virtual reality, ground-air cooperation, digital twin, parallel time and space, through Chinese dance, Chinese poetry, Chinese characters, Chinese solar terms, reflecting Chinese fashion, Chinese technology, and Chinese self-confidence, sweeping history and technology, tradition and fashion, and achieving the beauty of the world.

6.1. The concept innovation of the integrated mode of three-dimensional and four-level thinking teaching

Introduced by solar terms and poems, it promotes Chinese excellent culture, implements luxurious, gorgeous and delicate cultural influences, students are encouraged to cherish time, pay attention to time management, grasp the rhythm of their academic career, compose the beauty of their career, and integrate into the patriotic blood.

6.2. Path innovation of the collision and fusion of cultural classics and electromechanical technology

Guided by national strategies and industry needs, and using the typical application of mechatronics systems supported by a new generation of information technology as an example, from ancient times to the present, through ancient and modern times, technology and beauty, art, culture, and fashion are integrated to achieve the ultimate goal. Knowledge exploration is inspired, professional self-confidence and professional sense of responsibility with a developmental thinking is established, personal self-confidence is moved to national self-confidence, and a sense of historical mission in the digital age will be laid.

When it comes to the application of servo motors, it is necessary to comprehensively consider the wiring of cylinders, solenoid valves, and sensors according to the controlled mechanical mechanism, parameter settings of servo drives, IO wiring of PLC, position control of servo motors, and programming of PLC and HMI programs. Debugging, communication between HMI and PLC, etc. The core control link is composed of HMI and PLC. It involves computer, mechanical, pneumatic, electrical, programming and other multi-disciplinary knowledge, and multi-disciplinary cross is the current trend of science and technology, learn from each other's strengths and develop wisdom. Just as China is composed of multiple ethnic groups, it needs the leadership of the Communist Party and the concerted efforts of multiple ethnic groups to build a good motherland. When the people are of one mind, Mount Tai can move. The teacher teaches, the students are divided into several groups, the group leader leads, and the group members work together to master the content. At the same time, servo means that the system follows the external command to perform the desired movement. Team members must obey the arrangement of the team leader, all ethnic groups must obey the command and leadership of the party, serve on the correct path, and complete the tasks assigned. Carry ideological education with professional knowledge, and deeply integrate intangible value education with tangible professional knowledge.

6.3. One-stop practical innovation for capacity building, personality development, and value leadership

First stage is patriotism (responsibility and responsibility for manufacturing first), second stage is the action of strengthening the country (pursuit of excellence, learning the machine and understanding electricity), final stage is the ambition of serving the country (not afraid of hardships and improving electricity) as the main line. Parallel education is carried out online and offline, and domestic development and technological innovation as the mission pursuit is promoted. Students are cultivated to think about problems from multiple perspectives and to be fearless, persistent, and innovative. Skilled electromechanical technical skills are expensive spiritual nourishment. Curriculum and ideological and political penetration are dependent on each other, and they work together to change the world.

7. Parallel education helps education realize informatization upgrading

The new generation of information technology is integrated into the ideological and political construction of the curriculum, making the curriculum more modern and civilian, and keeping pace with the times. The application of mechatronics system course describes the application of the new generation of information technology such as customized manufacturing, system integration technology, blockchain, energy storage, and helps the construction of Ideological and political courses with the course content itself, which is the feature of this paper. There are many ways of Ideological and political informatization in mechatronics system application course, such as smart classroom, parallel training, etc.

8. Epilogue

Mechanical and electrical students are energetic and love to endure hardships, but they are generally not very confident. Due to their young age and lack of experience, their vision is relatively limited. This course mainly guides students from Chinese culture and various aspects of science and technology to gradually build up their self-confidence, expand their minds from the perspective of the country, and contribute to the manufacturing industry.

Ideological and political courses should be subtle, and silent is better than sound. Therefore, mechatronics application courses can adopt green concepts, fresh paths, and beautiful scenes. Teaching and thinking are integrated, thinking and teaching are synchronized.

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