

Developing Robot Education and Cultivating Innovative Talents

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Abstract. According to the tasks and requirements of training innovative talents, through the comprehensive development and history of foreign robot education, the ideas and reference ways of developing robot education in China are given. With the research background of Robotics Education in Wuhan Institute of Technology, this paper makes a thorough discussion on the training of innovative talents.

Introduction

Li Keqiang, the Standing Committee of the Political Bureau of the Central Committee of the Communist Party of China and the premier of the State Council, pointed out that innovation driven is fundamentally dependent on talent. We should further break down all kinds of obstacles that impede the growth and talent development of talents, carry forward the scientific spirit of exploring unknown and pursue truth, create a good atmosphere of tolerance failure and encourage innovation, and fully stimulate the innovative vitality of talents, especially young talents. He emphasized that college students are the main force of implementing innovation driven development strategy and promoting public entrepreneurship and innovation. They should learn and grasp more knowledge and devote themselves to innovation and entrepreneurship and improve their practical ability.

The Tasks and Requirements of Innovative Education

The Ministry of education pointed out in "on higher education and vigorously promote the innovation and entrepreneurship education and Entrepreneurship of university students work opinions" carrying out innovation and entrepreneurship education in Colleges and universities, actively encourage college students to start their own businesses, is the practice of Scientific Outlook on Development deep learning education system, major strategic initiatives to serve the innovative country construction; deepen the teaching reform of higher education and an important way to cultivate students' innovative spirit and practice ability; is the implementation of entrepreneurship to promote employment, an important measure to promote the full employment of College graduates.

The basic task of innovation education lies in:

(a) cultivation of innovative consciousness: to initiate students' sense of innovation and entrepreneurship, so that students can understand the quality requirements of innovative talents, understand the concept, elements and characteristics of entrepreneurship, and enable students to master the basic knowledge of entrepreneurial activities.

(b) innovation ability is cast: to analyze and cultivate students' innovative and entrepreneurial qualities such as critical thinking, insight, decision-making, organizational coordination and leadership, so as to enable students to have the necessary entrepreneurial ability.

(c) cognition of innovation environment: guide students to understand today's business and industry environment, understand entrepreneurial opportunities, grasp entrepreneurial risks, grasp the development process of business models, design strategies and skills, etc.

(d) practical hands-on exercise: through entrepreneurial plan writing and simulation practice activities, we encourage students to experience all aspects of entrepreneurial preparation, including venture market evaluation, venture financing, business process and risk management.

Thus it can be seen that the aim of innovation education reform runs through the whole process of talent training. In order to achieve the goal of innovative education, we must strengthen the cultivation of innovative consciousness, enhance ability education and deepen practice teaching in the whole teaching process. Therefore, it is necessary to reform the curriculum, teaching content, teaching methods and teaching methods, and the construction of teachers.

Carry Out the Education of Robot and Promote the Reform of Innovation Education

Carry Out Universal Robot Education

Robots are the crystallization of the unprecedented creation and invention of human history. It integrates human wisdom with machines, and is the perfect tool for human beings. The robot is coming to us, and it will become an important part of human beings.

In some developed countries, robot education has been popularized to large and middle schools, and it is actively exploring the path of the development of robot education. In the United States, the educational departments of the states have set up their own standards for the education of robotics. The robot education in the United States in the field of basic education mainly has four forms: one is the course of robot technology, opened in the general curriculum of applied technology, the application of project design and application of the majority; two is the practice and experiment, comprehensive experiment course in China; the three is the extracurricular activities, such as robot theme summer camp other regular activities; fourth forms and three types, mainly uses the robot technology as auxiliary tools to assist the teaching of other courses, or as a research tool to cultivate students' innovation ability. In a word, the learning of robot technical knowledge is classified as a special form of robot education. Robot education in American colleges and universities is also effective. For example, Massachusetts Institute of Technology has introduced the introduction of robotics, etc. the examination content of the course is the robot application works made by college students, so as to test the robot's knowledge level and operation ability.

Japan is one of the countries with the highest level of robot education and robot industry in the world. Japan has not only enrolled robot related courses in the syllabus of primary and secondary schools, but also has robotics majors in universities. Almost every university has a high-level robotics research conference, and regularly conducts robot design and production competition, and encourages and promotes the continuous development of robot products and robot technology. After the leakage of Fukushima Daiichi nuclear power plant in Japan in March 2011, a number of Nuclear Defense robots were launched in Japan's Tokai electric power plant in March 17th, and the data of radiation, temperature and oxygen concentration were detected on the spot, and the implementation plan for all kinds of rush repair operations was formulated. On the basis of robot education, through the application of social robots, promote the transformation and rapid development of Japanese automobile industry, electronic industry, machinery manufacturing, precision instruments and other industries and the economic structure, promote the upgrading and adjustment of industrial structure in Japan after the war, provide a guarantee for the rapid economic development of Japan. In addition, in recent years, Britain, South Korea, Singapore and other countries have also introduced a series of measures to promote the development of domestic robot education, countries hope that through the robot education and drive the development of the robotics industry, so as to realize industrial upgrading, promote sustainable economic growth.

The Robot Education is the Source and Carrier of Innovation Education

Robot education provides a broad space for innovative education, and is a good material for developing the talents and potential of each student and cultivating creative talents with high quality. From the value of robot education. First, the robot is an excellent platform for scientific research, which contains rich scientific value. In universities and research institutions, researchers conduct various scientific researches on robot platforms, especially in mathematics and computer science.

The course learning based on the robot platform is closely related to the cultivation of innovative talents. First of all, based on the related courses of robot platform, learning can exercise

thinking ability, which is consistent with the six step thinking skills required in creativity training, including naming, computation, evaluation, manipulation and observation. Secondly, in the process of their technology design and computation, they will use a lot of scientific inquiry methods to improve their ability to solve problems. Thirdly, the robot platform can improve the students' understanding of the concept of the system, which is one of the most important concepts in science education. The robot platform can also improve the students' thinking skills. The core knowledge learning based on robot platform includes: tool manipulation, data acquisition and processing for sensor device, decision evaluation by software programming and variable correction, and observation of robot execution procedure.

Because of the richness of the content of robot development environment, students need to measure environmental parameters in order to control robots to accomplish specific tasks. They are calculated by setting sensor values, evaluating time variables, and testing these variables by writing programs. The students adjust the results by observing the results of these tests. Manipulation, observation, calculation, and evaluation of the four processes coincide with the characteristics of the thinking skills required in the cultivation of creativity.

Robotics Education, Research and Exploration in Wuhan Institute of Technology

In 2004, the Ministry of Education approved the establishment of an intelligent science and technology undergraduate major, which marks the high importance of our country to the development of intelligent science and technology. Wuhan Institute of Technology is one of the first universities in the Ministry of education to set up an intelligent science and technology major. The robot competition is the advantage of the Wuhan Institute of Technology's intelligent science and technology major, with twelve World Championships in ten years. Therefore, robotics course is the core course of intelligent science and technology specialty. In the design of professional training plan, our school set up this course for undergraduates.

In terms of curriculum, innovation and entrepreneurship education curriculum system mainly consists of the following three parts: the first level for all students, to cultivate students innovation consciousness, stimulate innovation and entrepreneurship students' motivation to the popularization of curriculum; the second level, for the strong innovation, entrepreneurial intention and potential students, to improve their basic knowledge and skills and special series of professional courses; third levels, all kinds of practice curriculum aims to cultivate students' innovative practical ability, to the project, for guidance, teaching and practice combined, targeted to strengthen the students' entrepreneurial process guidance.

In terms of teaching methods, we mainly use the following methods: group discussion, task teaching, case teaching, role playing, multimedia teaching, establishing mod mechanism, and using modern education network to improve teaching efficiency. We should reduce classroom teaching hours, increase the hours of experimental teaching, increase the proportion of comprehensive and designing experiments, and increase the total number of weeks in practice teaching. Teachers should be encouraged to put scientific research achievements into teaching materials, teaching cases and experiments. In the teaching content, in addition to the basic content of kinematics and dynamics, adding visual servo control applications, mobile robot (multi-agent) path planning, multi-sensor fusion control etc.; combined with the principle of automatic control course, dynamic modeling of intelligent robot vision about the position of complete operation (which is the main content of existing robotics of course), calibration, image processing, visual servo controller (after the three robotics course not involved, but when the application needs) design a set of content, so that students on the robot application is the whole understanding.

For robotics course teachers' practical ability is weak, the following reform and practice: (a) system to arrange professional teachers to the enterprise practice, participate in product development and production process of the enterprise; (b) by employing enterprise technical personnel (base unit: Shenzhen eagle eye Online Technology Co. Ltd.) as part-time teachers and the establishment of Engineering Education Center in the enterprise, make enterprise technical personnel involved in the training process; (c) through cooperation with universities of Portsmouth

University Cilisi contact, exchange of teaching and scientific research methods, improve the level of internationalization.

In terms of textbook compilation, we first solve the problem of division of labor in Teachers' team, and assign corresponding chapters according to each teacher's research priorities or business expertise. Secondly, the following principles should be followed in compiling teaching materials: selecting realistic and interesting materials, providing students with space to explore and communicate; important teaching concepts and teaching ideas should reflect the principle of spiral up; and pay attention to the connection and integration of different parts.

Improve students' interest in curriculum study. In the second year of the University, a number of robotics team (each team 4~5) was set up. All the students in this grade participated and managed dynamically. A team of 1~2 teachers, under the guidance of teachers, began to carry out extracurricular activities of science and technology and scientific research and training. Regular lectures, exchange meetings, reports and other forms will be presented by experts and students themselves, so as to broaden their horizons, enhance academic exchanges between teams and teams, and create a strong academic atmosphere. The innovation credits of college students are set up, and innovative credits are given to students who have achieved achievements in all kinds of scientific and technological activities and competitions in various disciplines. Students have to get a certain degree of innovation in obtaining a degree, and the more than the innovation credits can also offset the credits of some elective courses. We should strengthen communication and feedback between teachers and students, open a meeting of teachers' teams once a week, find problems in time, and constantly adjust measures to ensure the smooth development of the work.

Conclusion

Vigorously develop the university robot education, to the challenge cup and entrepreneurial design contest as a carrier, carrying out innovation and entrepreneurship education; college students employment guidance course based on carrying out innovation and entrepreneurship education; college students entrepreneurial base (Park) as a platform to carry out innovation and entrepreneurship education; cultivate the final realization of College students' innovative talents.

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