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The Research on Teaching Plan of the Sports Equipment Engineering Specialty

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Abstract. purpose: To make the teaching plan of the Sports equipment engineering specialty adapt students' development better.Method: According to analysing the teaching plan of Sports equipment engineering specialty in Shenyang University of Technology, the basic course, specialized course, main experiment and main practice of this subject were introduced. Result: Summarized the curriculum periods and the credits of basic courses and specialized courses, and their corresponding proportion.Conclusion: The Sports equipment engineering is a new specialty. It needs to be adjusted in the developing process.

Key words: Sports equipment engineering specialty; teaching plan; Shenyang University of Technology; sporting goods

1. Preface

The essence of education is cultivating ones social activity. The essence of higher education is cultivating advanced special social activity. Training qualified personnel, developing science and serving society are the three big functions of modern higher education, where cultivating personnel that accommodating the needs of society is the basic task. Accordingly, teaching is the central task of a college. So improving the teaching quality is the eternal theme of higher education. The colleges should consider both meeting the need of socio-economic development, promoting science and technology on their own initiative and making a scientific orientation.

China is a developing country, the multi-dimensional coexisting pattern of modern productive forces and diversity of industrial structure decide the multi-dimensional structure of higher education. It requires the higher education to cultivate variety of specification and high-level professional personnel to adapt the need of different productive forces levels, different enterprises and different technical posts. But the talents majored in Sports equipment engineering are extremely deficient in China. For this reason, Shenyang University of Technology offered the Sports equipment engineering specialty. Because the Sports equipment engineering is a new specialty, there are some problems exist in the process of making and practicing teaching plan. It is necessary to make some deeply research and discussion on it.

2. The new requests of sports industry to the education of Sports equipment engineering under current circumstances

With the rapid growth of economy, our society is undergoing huge transformation. Although the sports industry in China starts late, it develops very quickly. The continuous expanding of the field and scale of sports industry let the industrial benefit increase significantly. In the development of socialist market economy, sports industry has constructed a unique industrial field.

The Chinese sporting goods industry has experienced the process of from miniature to large scale, from imitation to innovation, from planned economy to market-oriented economy. At last, it moved toward the international market from the sealed domestic market. This remarkable achievement arouses general interest of the overseas professionals.

Recently, some cities near the sea or river in China (e.g., Fujian, Guangdong, Tianjin, Qingdao and Dalian, et al.) where have very sensitive commercial economy sense are using their convenient traffic, good

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infrastructure and high-quality workforce to introduce funds, technique, equipment and the advanced management experience actively. By cooperating with the foreign manufactures, they promote new generation of high grade domestic product. These achievements fill in the gap of the sporting goods industry and have very important significance of import substitution. We need more and more professional talents to improve this process, so, training professionals of Sports equipment engineering appears extremely urgent.

Higher education shoulders the important task of training talents for economic development. As same as that, the Sports equipment engineering specialty shoulders the task of training the talents for the Sports equipment industry. Therefore, the Sports equipment engineering specialty should strengthen the Professional competence education, emphasize the overlapping and comprehensive of different kinds of knowledge and the practicality. It should also focus on the solution of practical engineering problem. Therefore, graduates of Sports equipment engineering specialty should possess the following knowledge and skills:

(1) Having certain basic knowledge of natural science; knowing the main direction of current scientific technological advancements and application prospects.

(2) Mastering the basic theory of sports science, mechanical science, electrical science and materials science, et al;

(3) Having the ability of engineering drawing, computer application, having the basic Operational capability of testing equipment and conducting experiments, having the ability to combin multiple means(including foreign language tools) to obtain information and search references;

(4) Having the ability of engineering design, test and research.

3. The training objective of Sports equipment engineering

To determine the training objective of sports equipment engineering, it is necessary to understand the employment trends of the graduates and understand employer's requirements and evaluation to the graduates. Investigation of the market shows that many sporting goods companies not only require students to have sports science and mechanical science knowledge, but also have strong practical ability and the ability of solving practical problems.

According to the new requirements of sporting goods enterprise to the sports equipment engineering professional education, combining with the school condition, the structure of teachers, the sources of students and employment of graduates and so on, the training goal of the sports equipment engineering in our university is: training highly qualified talents who are developed in an all-round way morally, intellectually and aesthetically, has the basic theory and knowledge of sports, master the basis of sports science, mechanics, electrical and electronics and material science, has the ability of sports equipment's developing, design and production and can take the developing, design and manufacture tasks in the area of sports equipment.

4. Formulating the teaching plan for the Sports equipment engineering specialty

4.1. Public basic course

Public basic courses include Cultivation of Ethic Thought and Legal Base, Modern History of China, Principles of Marxism, Mao Zedong Thought Deng Xiaoping Theory and “The Three Represents” Important Thoughts Introduction, College Foreign Language, Advanced Mathematics, College Physics, Experiment of College Physics, Linear Algebra, Probability Theory & Mathematical Statistics, College Computer Basis, VB Language Program Designing and so on. Above curriculums are mainly offered in the first year in college.

4.2. Discipline basic course

The discipline basic courses include Engineering Drawing, Fundamentals of Electrotechnics, Basic Electronic Technology, Experiment of Electrical Technology & Electrical Engineering, Sports Theory and Practice, Modern Sports Event Outline, Introduction of Sports Equipment, Engineering Mechanics ,Principle of Mechanics (including Scientific English), Mechanical Designing, Experiment in Mechanical Designing, Geometry Quantity Precision Design and Examination, Basis of Control Engineering, Principle & Applications of Computer, Mechanical & electrical Transmission Control, Fundamental of Mechanical Manufacture Techniques, Hydraulic and Pneumatic Transmission , Man-Machine Engineering , CAD/CAM Technology and Project Software. Above curriculum are mainly offered in the second and the third year in college.

4.3. Specialized course and specialized definition elective course

Specialized courses include Basis of Human Body Engineering, Sports Biomechanics, Creation Engineering, Principle and Method of Fitness, Testing Technology, Mechanical & Electrical Integration System Designing, Sports Equipment Designing, Modern Designing Method and Application.

The specialized definition elective courses include Computer Control in Mechanical System, Sports Aesthetics, Industrial Products Molding Designing, New Material of Sports Equipment, Sports Economy and Industrial, Basic Industries Engineering and so on.

4.4. Main experimental teaching link

Main experimental teaching link mainly consisted of Experiment of Physics, Experiment in Electrical Technology & Electrical Engineering, Synthesis Experiment in Mechanical Designing, Experiment of Engineering Mechanics, Experiment in Geometry Quantity Precision Design and Examination, Experiment in Basis of Control Engineering, Experiment in Mechanical & Electrical Transmission Control Technology, Experiment in Mechanical Manufacture Technology, Experiment in Hydraulic and Pneumatic Transmission, Experiment in Man-Machine Engineering,Experiment in Basis of Human Body Engineering, Experiment in Sports Biomechanics, Experiment in Testing Technology Structural Testing and so on.

4.5. Main practical teaching link

Main practical teaching link mainly includes Military Training, Sports Theory and Practice, Metalworking Practice, Course Design of Graphing of Engineering, Specialty Cognition Practice, Production Practice, Course Exercise in Electronic Technology, Course Exercise in Mechanical Design, Course Design of Sports Equipment, Graduation Thesis and reply and so on. In addition Quality Development and Innovation Education may be selected optionally.

4.6. The graduation qualifications and the degree award request

Table 1 each kind of curriculum periods and credits assignment

curriculum		Compulsory			Limited elects			Optional		Sum total		
		credit	period	Experiment Hands-on	credit	period	Experiment Hands-on	credit	period	credit	period	Experiment Hands-on Practice
curriculum Experiment teaching	Public foundation	56.5	904	120						56.5	904	120
	Discipline foundation	57.5	920	118						57.5	920	118
	speciality	19	304	44				6	96	25	400	44
Practice teaching	Military training	2								2		2 (week)
	athletic sports				4					4		4 (week)
	Curriculum project class	7	112							7		7 (week)
	Practice class	8	128							8		8 (week)
	Graduation project	18	288							18		18 (week)
Quality development and innovation education	Quality development curriculum	3	48					7	112	10	160	
	Special education	6								6		
	Quality development and innovation practice							4		4		4 (credits)
Grand total		177	2128	282	4			17	208	198	2384	282 (39+4)

Note: The practice (in centralism practice + class tests + in class hands-on) the proportion： 30.7 %

Takes as an elective the proportion (to choose curriculum, to choose content)： 10.7%

At Shenyang University of Technology, every graduated student in Sports Equipment Engineering Department is required to get 198 credits, where 177 credits are for compulsory courses and 21 credits for limited optional and optional courses. In public basic courses, compulsory courses occupy 56.5 credits, Discipline basic courses occupy 57.5 credits, specialized courses, practice teaching link and quality development and innovation education are 19, 35 and 9 credits, respectively. The students in the Department who fulfil the graduation conditions, and is qualified in academic achievement, are awarded bachelor of engineering degree. Credits and study period assignment of each teaching links are shown in Table 1.

5. The characteristic of sports equipment engineering

5.1. Specialty's orientation

This specialty trains the personnel to make them have the basic theory and knowledge of sports, master the basic knowledge and applied engineering technology of sports science, electrical and electronics, material science and mechanics, who can engage in the work of sports equipment's developing, design and manufacture.

5.2. Adapt the specialty for developing local economy, serving the sporting goods enterprise and satisfying the social progress

The developing and manufacture of sports equipment meets the needs of founding national brand to enhance the competition in international market, improving the living standards and quality of the people so as to achieve the “National Physical Fitness” Programme, revitalizing sports through science and technology and enhancing the level of the sport skill to realize the programme for Olympic Honours.

5.3. Specialty’s characteristics

The sports equipment engineering trains personnel for designing,producting and developing chinese sporting goods.The major characteristic of this speciality is that sporting goods design ,manufacturing technology and modern electronic control technology integrate into the athletic sports.Its accent is on training students' practical ability and the ability of mastering general engineering software. Facing to the sports equipment company,it take training the application development engineering technology talent as the objective .It serve as the National Physical Fitness Programme and the Programme for Olympic Honours.

The sports equipment engineering specialty trains qualified personnel in sporting goods design, manufacture and developing field for our country. The major characteristic of this specialty is integrating sporting goods design, manufacturing technology and modern electronic control technology into the athletic sports. It emphasizes on the students’ ability training on practice and mastering general engineering software, aims at training the sports equipment company oriented application and development engineer and serves the “National Physical Fitness” Programme and the programme for Olympic Honours.

“Sports equipment engineering” is an interdisciplinary subject which includes Sports science, mechanics, Electrical and Electronics, material science and mechanics, and it is a new branch of science into which multiple disciplines integrate. It mainly research on developing, design and manufacture of sports equipments.

6. Conclusion

The formulation of the teaching plan of sports equipment engineering in the Shenyang University of Technology is for the first time, so there is no successful experience that can be used as reference. According to the market and the sporting goods company's requirements to the talents, we will adjust the teaching plan timely. In the following revision of the plan, it will emphasized on cultivating the professional skills and the practical ability of the students, strengthening the practice teaching link, expanding the scope of knowledge and offering courses in sports equipment trade.

As a new specialty, Sports equipment engineering will got into all manner of trouble in its developing process, so it needs the joint efforts of experts and scholars who devote to the development of sports equipment engineering to let this specialty reach a higher level.

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