Keywords: Modern engineering, Practice teaching, Humanistic literacy, harmonious society.

Abstract. The essence of modern engineering for 17 years is made clear. The definition, the object and the subject of modern engineering practice teaching are offered systematically. The request was put forward to main body. The difference between object equipment and experimental teaching object equipment is expounded. Modern engineering practice teaching is an important way for college students to acquire engineering ability directly. The practical teaching of engine engineering covers multidisciplinary knowledge.

Introduction

With the rapid development of science and technology, science and technology project is not only the science and technology itself. It involves the responsibility, safety awareness, environmental awareness and energy conservation awareness of technical designers. Besides; it presents a new challenge to the quality of the modern engineering and technical personnel. The change of engineering nature must bring new requirements to the ability and quality of engineering and technical personnel, and put forward higher teaching requirements for modern university education. The author studied the teaching practice for 17 years. As shown in figure 3.

Modern Engineering Practice Teaching

The Essence of Modern Engineering

To make the knowledge of modern science and technology, safety and environmental protection knowledge, knowledge economy, knowledge management, knowledge of the humanities apply to water conservancy, construction, environmental protection, vehicle, machinery and other engineering practice. In order to meet the need of human spirit and the pursuit of material, solve the practical problems of survival and employment; achieve the purpose of harmonious human self, harmonious society and harmonious nature.

Definition of Modern Engineering Practice Teaching

It is a full range of research, analysis, learning process which main human discard the false and retain the true from the existing things of society and nature. At the same time, it is also a process which main human direct analysis, research and learning from objective solid machine, objective things and their laws in the life and production.

The Purpose of Modern Engineering Practice Teaching

1) To enhance the Humanistic Literacy, harmonious human, harmonious society, harmonious nature, realize the correct understanding of the true meaning of life in the universe.
2) To enhance the own comprehensive engineering consciousness of main people and their engineering practice ability.

The Object of Modern Engineering Practice Teaching

1) They come from the objective society, the natural phenomenon of the objective existence in nature, the objective existence of the facts, the actual occurrence of events and so on.
2) They come from the reality of the real engineering design and production, machine equipments are being used in life and other entities.

The Subject of Modern Engineering Practice Teaching

Objective existence Human

The Requirements of Modern Engineering Practice Teaching

1) With a correct understanding of the true meaning of life in the universe and the correct practical experience.

2) With the consciousness of dialectical thinking and the practical ability to solve the objective practical problems by syndrome differentiation.

3) With knowledge or participation in the practical experience of the real society and the actual production.

4) With good basic knowledge and professional knowledge.

5) With a strong comprehensive analysis of the development of the objective world.

The Difference between the Practice Teaching Object Equipments and Experimental Teaching

Let me take the difference between the automobile engine and the gear reducer as an example to illustrate the difference between the practice teaching object equipments [4,5].

Practice teaching object equipment as shown in Figure 1 is an engine that is used in production, while experimental teaching object equipment as shown in Figure 2 is an engine teaching model that doesn’t involved in production.

1) The degree of difficulty in studying two devices above is very different

There is at least lubricating oil inside the practice teaching engine that used in production. This engine is very heavy, dirty and large (micro structure except). However, there is no lubricating oil inside the practice teaching engine model that does not involved in production, it is very clean and light.

2) Their complexity is not consistent

Their complexity is not consistent from the appearance as well as internal structure and the structure of parts.

Figure 1. Practice teaching object equipment-engine.

Figure 2. The experimental teaching object equipment.
3) Local small structures are not consistent
A number of key structures are not reflected in the practice teaching engine model that does not involved in production, while these small local structures are the keys to the performance of the machine, they are also the essential factors in machine design. But these structures of small parts are almost perfect performance in the practice teaching engine that used in production.

4) The precision of coordination between the parts is not consistent
The reducers and engines that used in production as well as the coordination between parts are strictly in accordance with the design requirements and work requirements for design, manufacturing, assembly and acceptance. But the experimental teaching model is a model of teaching mapping reducer and teaching engine that does not involved in production. Therefore, the relationship between the parts is not completely design and manufacturing in accordance with the different requirements of the machine.

5) A large difference in the number of parts
There is a large difference in the number of parts between the engine that used in production and the practice teaching engine model.

6) The material completely inconsistent
The material of the engine that used in production and the practice teaching engine model is completely inconsistent.

7) The time spent is different in disassembly and mapping between the two models.
If only for the disassembly and assembly practice teaching entity, the time spent of the engine that used in production is 4 to 16 times longer than that of the practice teaching engine model in disassembly and assembly, because of the strict degree of coordination, the complexity of the structure, the operation and the number of parts are not consistent.

8) Engineering knowledge acquisition is different
The included engineering knowledge is different between the engine that used in production and the practice teaching engine model. After main body person viewing, dismantling, mapping the model and the engine entity, there is an immeasurably vast difference between the psychological understanding of engineering awareness and the psychological understanding of engineering ability.

Conclusion
1. To define modern engineering practice teaching
2. Through the case of the difference between the practical teaching and experimental teaching is expounded
3. The modern engineering practice teaching is an important way to cultivate college students' direct access to the engineering capacity.
4. The cultivation of engineering consciousness lies in the direct contact with the practical production equipment, direct experience of the authenticity of the device structure, the complexity of the structure, the authenticity of the function, the authenticity of the number of parts.

5. The engine engineering practice teaching course covers multidisciplinary knowledge.

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References


