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Analysis on the Teaching Reform of Computer Aided Instruction

Yan Liang

Hainan Vocational University of Science and Technology, Haikou, 570000, China

Abstract: *Computer aided instruction design is a basic course for mechanical majors in colleges and universities across the country. With the deepening of interdisciplinary interface and the general improvement of students' quality, many non mechanical design majors have also opened related courses. This course focuses on mechanical practice, mastering 3D design software such as Solid Works, UG and PROE, and expanding theoretical knowledge and application tools of mechanical design are skills that contemporary students must master. However, most colleges and universities mainly offer courses in the form of teachers' theoretical guidance, model demonstration, students' repetition and so on. This method limits students' knowledge, can not fully grasp the relevant operations and basic principles, and limits the teaching effect of the course. This paper mainly introduces the new teaching concept of the combination of computer aided instruction and mechanical design practice courses, and gives the corresponding teaching reform treatment, hoping to provide a new teaching method for engineering teaching in Colleges and universities.*

Keywords: *Computer, Mechanical Design Teaching, Reform in Education*

1. Introduction

At present, major colleges and universities across the country have opened a basic course: Computer Aided Instruction (CAI). With the rapid development of science and technology, computer-aided information technology has become more and more powerful. Therefore, the mechanical design degree course must strengthen computer-aided progress and improve the quality and skills of mechanical design professionals, which is very important. The development of network teaching mode redefines teaching methods. Colleges and universities have launched online teaching courses and adopted the network model for online teaching. However, the problems caused by this are becoming more and more obvious. Various curriculum teaching reforms are also emerging in endlessly. Designing appropriate teaching models for different courses, but only blindly changing teaching methods, and not paying attention to deepening students' learning level, the frequency of teacher-student interaction and the optimization of learning methods in the teaching process, which will lead to the reduction of students' interest in the course; Especially in CAI teaching, it is not only to impart knowledge, but also to improve skills. In the process of CAI teaching, it includes classroom explanation, students' actual operation, business practice and other teaching contents; As one of the most important learning subjects in the professional field, students must have a solid understanding of the theoretical knowledge and professional operation skills of this subject, which can not only solve practical problems in work, but also carry out technological innovation. Through the practical internship of the company, students can have a clear understanding of their major, successfully complete the learning plan, and lay a good technical foundation for further learning content.

2. Problems in teaching

2.1. Teaching method and teaching mode are separated

At present, all colleges and universities are taught by teachers, and the only way for students to listen is the lack of interaction. Students cannot directly see mechanical models and structures, let alone deeply understand textbook knowledge, which leads to students' inability to flexibly master skills and affects their innovation consciousness; At the same time, it also reduces students' interest in learning, leading to the phenomenon that teachers teach alone and students are unwilling to learn, making students unable to master professional basic knowledge, reducing the applicability of students' professional skills, making

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it impossible for students to carry out in-depth content learning, making students unable to grasp the focus of subsequent courses, slowing down students' learning progress, and the learning content is not solid, which is unable to form a knowledge framework in the professional field, resulting in a lack of theoretical knowledge.[1]

2.2. The course content is inconsistent with the most important learning content

Due to the limited scope of school laboratories, obsolete equipment, slow renewal and other reasons, students' practical ability is limited. Therefore, students cannot apply the knowledge they have learned to practical operation, and it is difficult to quickly absorb knowledge in the classroom, resulting in students becoming theoretical talents and unable to meet the needs of society and enterprises; Most of the contents of the course are different from the knowledge learned. The teacher and the course content are different, and the lesson preparation is insufficient. They are unable to sublimate the teaching subjects in combination with the students' learning content, which leads to doubts about their professional knowledge and inability to study the major in depth.

2.3. The school does not attach importance to the content of professional practice

The school has always adopted examination oriented education, which measures students with examination results. Practical computer skills are not part of the exam. When students enter the society, they have only theory, no practical skills, and can't easily deal with work; Especially in business practice, students can't come to the scene to feel the real computer operation, which reduces the fuzziness of professional skill operation and leads to monotonous theoretical learning; In the professional field, it is impossible to obtain systematic professional knowledge, so that students have theory but can't work; At the same time, courses without professional practice content will lead to students not focusing on course learning, only repeating the theories in textbooks, but unable to really understand them. [2]Students can't master the theoretical core knowledge and professional skills of this major, nor give full play to their skills in future work to solve the practical problems of the company.

3. Specific measures for educational reform

3.1. Reform of teaching methods

Computer engineering is used in mechanical engineering degree courses. The teacher explained the AVI document, the key points of knowledge in each chapter and the PPT document of electronic mode teaching. By combining book content with images and videos, students can learn after class and understand and think more clearly, and open communication channels after class, so that students can ask teachers to answer questions in time. In class, we arrange interesting tasks based on the content after class. The so-called interesting task is that students actively design components according to their own interests, let students go to the podium, show their works after class, explain the production process, and the teacher makes comments in class. At the same time, we have revised and optimized the products designed by students to achieve an interactive classroom atmosphere and make students become protagonists. We should enrich the classroom content, improve students' learning motivation, and actively complete the tasks assigned by teachers; This method can stimulate students' interest in learning, make students absorb knowledge nutrition well, and improve students' learning efficiency and teachers' teaching quality; Meanwhile, teachers can use Internet technology to find professional technology videos suitable for students to learn online, explain them in person, and combine offline business practice to let students first understand professional technology through theory to the company for hands-on operation. The combination of the two enables students to have a deep understanding of what they have learned, and can be trained repeatedly, so that students can firmly grasp the professional skills they have learned and improve their ability to solve problems in their future work; The reform of teaching methods should pay attention to teaching quality, which is reflected in improving students' learning efficiency, mastering professional knowledge and improving practical operation ability. The combination of different teaching methods is used to impart knowledge, help students study the difficulties in professional courses, and cultivate students' practical skills.

3.2. Teaching content reform

The school should cooperate with the company in running a school, so that students can practice more

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in the company, guide students purposefully according to the objectives of learning content, let their design ideas play a role, and apply the skills and knowledge learned in the classroom to practice, so as to obtain practical recognition, and realize the combination of theory and practice to have the ability to accurately grasp theoretical knowledge and solve practical problems, as well as systematically master the basic knowledge and skills in the field of this major. [3]Teachers should unify mechanical structure, mechanical design course practice, mechanical professional practice and the teaching content of this course in combination with relevant courses. Students learn theory in mechanical design course, learn hand-painted animation in mechanical design course practice, understand and master mechanical engineering in mechanical professional practice through CAI course, so as to and finally electronize the design content. Students can combine theory with practice and have better learning effect. Through continuous content innovation, students can be exposed to the latest professional skills, master the latest theories and practical operation methods, and make contributions to the development of the country and society.

3.3. CAI curriculum reform

According to the actual needs of enterprises, CAI courses should integrate theory and practice into teaching and teaching, so as to cultivate qualified technical talents. Its curriculum system aims to master basic knowledge, basic principles, pay attention to practical working methods, learn new theories and methods, and improve teaching level. The reform of teaching content can adapt to classroom links, internship content and extracurricular homework, and improve students' interest in learning in professional fields and practical skills, in order to enable students to systematically understand the professional subjects they have learned, and lay a solid foundation for the study of subsequent courses.[4]

3.4. Strengthen the design examples in the textbook

Because the mechanical design class involves a lot of theoretical knowledge, and it is difficult to master, it is easy to make students feel boring. In order to enhance students' self-confidence, we should focus on introducing the application of relevant knowledge of problem solving and examples in the textbook, so that students realize that they can use the knowledge learned in this course to solve practical problems. For example, a lot of the current design work is to make some changes to the original design. If every change of data is to redesign the original drawings, it is bound to cause a lot of manpower and financial resources. The solution to this problem is secondary development, such as SolidWorks secondary development using VB. The secondary development software can well solve the graphics change caused by the graphics size change, and the designer can only enter the required size or other driving parameters to remodel, without other operations. A design interface for part parametric is presented. By explaining the specific implementation process of these teaching methods, students can help to reproduce the process of problem solving, so as to enhance their self-confidence.

Take AutoCAD as an example, with drawings as the core, remember instructions and other functions, the input way of instructions is the same, as long as you pay attention to the execution of several instructions in class, you can enhance students' memory. Therefore, the teaching focus of the instructions is to remember the function of these instructions. Teachers should clearly understand the content, needs and plans of the course. At the same time, we should also take into account the various situations in the drawing process, as well as the students' ability to understand the project, so that the students are in a state of learning and absorption at any time in the project, and can find out and solve the problems in time.

3.5. Positive Effect of Teaching Design of Computer Auxiliary Mechanical Design

Modern information technology, as a powerful carrier with real-time, sharing, compatibility and other functions, can provide teachers with rich teaching resources in the process of mechanical teaching reform, enrich their teaching methods and methods, so as to break through the traditional shackles. At the same time, the computer technology can also meet the needs of different learners, and provide the corresponding knowledge system for different learners. In addition, the teaching content presented by the computer can also break away from the boring traditional books, and stimulate students' interest in learning through the sound and color. Through the understanding of the basic operations and principles, the students can constantly use the associate thinking to expand the thinking space, improve the thinking ability, and cultivate the students' core literacy in the field of mechanical design. At the same time, the computer teaching mode can also reflect the parts and movement structure of the machine more than the

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traditional textbooks, which can let the students freely show the movement of the machine on the computer, so as to improve the students' practical ability. Nowadays, the teaching information reform has become an important development trend, and the means of computer-aided teaching has been widely used in the teaching activities of mechanical design. This information-based teaching method improves the efficiency of classroom teaching and reflects the development trend of intelligent classroom transformation. Relatively speaking, the information teaching method has changed the traditional teaching mode in the process of promotion, giving students more freshness and experience. To some extent, teachers also improve their own teaching efficiency, enrich their teaching means, and expand their teaching thinking. Computer-aided teaching will receive more attention in the future promotion process, and also reflects the application advantages and promotion practice of computer teaching, hoping to realize the students' cultivation of employment ability to the greatest extent.

4. Conclusion

In a word, we live in the data age with the rapid development of scientific and technological information. With the continuous change of teaching mode, the Internet is becoming more and more indispensable in our life. The current teaching mode is gradually moving towards the Internet. CAI is not only the trend of the times, but also an assistant to improve work efficiency. It is not only a simple teaching tool, but also a link between students and teachers. Computer assisted instruction will play a more important role in the future. Therefore, teachers must focus on learning in schools, and comprehensively improve their teaching level as an important core content of innovative teaching. Students should also cooperate with teachers, use computers, and learn science and culture well, in order to master the application skills of computers in learning, apply the learned theoretical knowledge to practice, and improve professional quality, the ability to solve problems, to become innovative talents needed by the country and society.

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