Teaching Reform of Applied Technology University Physics Based on Computer Aided System

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Abstract. Physics application practice is of great significance to the application of Physics and the cultivation of basic scientific research talents. With the continuous improvement of technology value cognition in the basic industry of China, the improvement of manufacturing industry competitiveness and the realization of innovation are inseparable from the participation of physical application technology. However, according to the results of industry research in recent years, the contribution rate of university Physics to society in China is far from expected, and there is still a lot to improve in the teaching of university application technologies and application practice abilities, which should focus on the future teaching. With the continuous exploration of Chinese computer education technology and data-base teaching technology, the teaching methods in colleges and universities have been greatly changed. According to the research, the current rate of online reading habits and communication habits of college students in China is up to about 67.9%. The demands of students' independent growth and the needs for society comprehensive talents make college Physics undertake more training responsibilities and ability teaching tasks. As an important medium of college teaching, the development and application level of computer-aided system has a certain impact on the teaching effect of college Physics. At present, the CAI system with multimedia courseware as the core couldn't meet the needs of students' study. Therefore, it is necessary to design and deal with the CAI System in a more diversified way. Because of its high abstraction, theory and comprehensiveness, the past teaching practice of college Physics is difficult to achieve high results. Therefore, based on the computer aided system, this paper explores the reform direction and feasibility realization mode of applied technology college Physics teaching.
Keywords: Computer Aided System, Applied Technology, College Physics, Teaching Reform

1. Introduction

With the reform of educational technology and the continuous development and exploration of educational data-base, the application technology based on computer-aided system is also developing[1-2]. Based on PPT courseware, MOOC, network course platform and other more flexible and diversified CAI systems and functions have been derived, but these common functions for technical Physics courses are far from enough[3-4]. With the rapid development of education, the training requirements and ideas of college Physics application talents are being rapidly improved. In order to meet the training objectives of basic Physics application talents in China, the college Physics course is facing a great challenge and test of the times[5-6]. Therefore, the reform and practice of Physics Teaching in applied technology-based universities are the core of Physics teaching reform. This paper systematically combs the problems of CAI in Physics teaching in applied technology-based universities through questionnaire survey, expert interview and classroom observation. Aiming at the above problems, based on the computer aided system, this paper will explore the reform direction and feasible realization mode of applied technology university Physics teaching.

2. Understanding of the main problems existing in the current Physics teaching of the application-oriented university based on the computer-aided system

University Physics is the most basic course of science and engineering. Its knowledge structure, experimental ability, expanding thinking and exploring ability are the foundation of scientific research innovation and basic application technology development in the future. Therefore, the quality and thoughts of college Physics teaching are very important to the development of college Physics. However, according to the author's research on the main structure of teaching content, the cultivation level of experimental ability and the single level of evaluation method in 100 university Physics colleges and universities in 21 provinces and cities in China, although many rounds of reform have been carried out in university Physics teaching, there are still many problems remained.

The current problems in college Physics teaching are mainly concentrated in the following three aspects: first, in the main structure of teaching content, the teaching of basic theoretical knowledge is still the main part, and there is no awareness and way to cultivate scientific research thinking; second, in the construction of physical experiment ability, the physical experiment is still dominated by teachers, lacking the ability of independent design and practice participation. Thirdly, the evaluation method still follows the basic assessment, lacking the cultivation and guidance of students' exploring ability and other growing abilities.

Physics is a discipline that emphasizes scientific research ability, independent thinking ability and operation ability. As a practical step of deducing process recurrence and conclusion of relevant basic theoretical knowledge points, physical experiment is very important for the cultivation of physical discipline literacy and ability literacy. Therefore, Physics teaching in Germany, America and other countries pays special attention to the cultivation of Physics experiment ability. According to the current mainstream research, Physics experiment consists of four parts, i.e. concept, design, implementation and
operation. CDIO is a highly recognized successful mode of higher Engineering Education in the current international education field, Remarkable achievements have been made in training students' innovation ability, practical ability, team cooperation ability, communication ability and organization ability. However, it is not difficult to see from the data above that the current common problems in college Physics teaching in China are as follows. At present, the design of the main content of teaching shows the learning characteristics of the post high school era. When teaching the basic theory of Physics, it still follows the thinking pattern dominated by teachers in the high school era, which brings certain disadvantages to the study of college Physics. 89.6% of college Physics lacks the thinking connection education between the middle school Physics and the college Physics, It can't help the students to adapt to the college Physics course smoothly; then, based on the computer-aided system, it makes an in-depth study on the training mode of Physics applied talents and the teaching reform and practice of the course, aiming to provide some ideas and suggestions for the deepening of the current college Physics teaching reform and practical talents training.

3. The exploration and assumption of Physics teaching reform in Applied Technology University based on computer aided system

3.1. Build a diversified experimental teaching environment and practical procedures to improve the openness and exploration of physical experiments

Due to the restriction of physical experimental materials and experimental sites, our physical experimental teaching has been in a closed type in the past, which leads to the experimental thinking, experimental results and students' experimental ability generally fail to keep up with the development requirements of times. Therefore, the exploration and assumption of the reform of Physics teaching in the application-oriented technology based on the computer-aided system should start with the physical experiment, to explore the construction of a diversified experimental teaching environment and practical procedures which to meet the requirements of students with different learning abilities and development levels for independent physical exploration learning and research, and to improve the exploration of the physical experiment. The changes of the management mode of Physics experiment are of great significance to the deepening of Physics teaching content and the promotion of students' comprehensive abilities. Based on CAI and Internet, distance teaching system of virtual experiment and application software of physical experiment, simulation modeling and virtual experiment process can be built, diversified teaching resources and environment can be formed, and exploration learning and divergent thinking of students can be stimulated. In addition, the application of computer-aided system in experimental research will greatly reduce the differences in teaching resources and teaching ability between schools, which is conducive to the cultivation and growth of basic scientific research and application talents.
3.2. **Strengthen the ability of information integration and the efficiency of information exchange in the process of teaching and learning, and speed up the improvement of the effects of college Physics teaching**

There are many basic theories of university Physics, which are highly abstract and lack of close connection with concrete life. As a result, the information symmetry and information transmission efficiency between teachers and students are also caused. In the application process of traditional PPT, as high as 78.5% of teachers make the PPT a main way to carry texts. Although 89.7% of universities have set up the campus network and corresponding teaching platform, due to the application program, there are still many reasons, such as lack of development and teacher training, etc. The computer-aided system does not do well to solve the problem of information release, the lack of supervision of learning process, the lack of feedback and monitoring of experimental results and other practical problems. Therefore, the second problem to be solved is to strengthen the ability of information integration and the efficiency of information exchange in the process of teaching and learning to accelerate the efficiency of college Physics teaching. Experiment process and experiment result feedback are the most difficult two parts in Physics experiment teaching. Traditional teaching methods and computer-aided system could do nothing to help teachers to realize real-time feedback and information interaction, which often affects students' process understanding, data sorting and other feedback abilities. Now based on mat lab Language can process and the experimental data progress and provide students with an efficient data processing environment and strengthen the transmission and feedback of information interaction process as well as to the students' understanding and mastery of relevant theories and principles of physical experiments. Therefore, based on the learning situation and teaching needs of each university, a university Physics experiment and teaching management system is established. From the three levels of goal refinement, task design, sorting and feedback, the examination, supervision, attendance, in and out of class management of students' knowledge and abilities to the audience and the processing of experimental data are strengthened. Through the real-time interaction between teachers
and students, students are provided with effective learning guidance and supervision in order to improve
the quality of Physics teaching, we should help students to deal with questions and clarify the key and
difficult points of the learning content.

3.3. Strengthen discipline thinking training and comprehensively improve the effect of Physics
Teaching in Applied Technology University

The contents of college Physics teaching are closely related. It is not only necessary for teachers to have
clear thinking and strict logic, but also to pay attention to the systematization of basic physical
theoretical knowledge system so as to pay attention to the training and cultivation of students' ability to
analyze and solve problems, especially logical thinking and non logical thinking. Only by strengthening
the discipline thinking training can students have rigorous discipline thinking and super intuitive
thinking in the process theory in the future scientific creation. College Physics is the basic course for
the junior students of science and engineering. Strengthening the thinking training of Physics is a basic
training to improve the number of students and the logical thinking of science and engineering.
Therefore, only strengthening the logical thinking and non logical thinking can we strengthen the
training of students' discipline innovation spirit, innovation thinking and scientific research ability in the
senior stage.

4. Conclusion

With the continuous development of teaching technology and big data education means, it is imperative
to reform the application-oriented university Physics teaching by computer-aided system. The
computer-aided system can effectively solve the process, system and connection of traditional Physics
teaching. Only by solving these problems can we pave the way for the content research and teaching
process innovation of Physics teaching. In this paper, based on the exploration of the reform of Physics
teaching in the application-oriented university of computer-aided system, three ideas are put forward:
the construction of diversified experimental teaching environment and practical operation procedures

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