Study and Reform of Computer Technology on Chemical Engineering Cartography Teaching in the Local College

Ling Ma
Department of Chemistry & Chemical Engineering, Baoji University of Art and Sciences
Baoji, China
bywind1999@126.com

Abstract
Chemical engineering cartography teaching plays an important part in the teaching system of the chemical engineering and technology in local colleges. In this article, the present chemical engineering cartography teaching situation of the chemical engineering and technology in local colleges was comprehensively and systematically analyzed by college students' investigation questionnaire. Moreover, some measures for chemical engineering cartography teaching were put forward based on computer technology, and a series of ideas for the reform thinking were proposed.

Keywords
Computer technology, chemical engineering cartography, local college, teaching reform.

1. Introduction
Since 1999, China began to enlarge the enrolling scale in higher education greatly in order to meet the growing demand of higher education. Chinese higher education have finished the transition of the higher education from the elites to the masses education in the past years [1]. Local colleges are important of Chinese higher education system, which is an important role about cultivating talents of social and economic development. How to carry out the requirements of comprehensive ability and promote the education of innovation and starting undertaking for the university students of 21 century, all these problems must be taken seriously and solved properly by Local colleges.
Chemical engineering cartography is an important specialized basic course of the chemical engineering and technology in local colleges [2]. That is why propose the total “Study and Reform of Computer Technology on Chemical Engineering Cartography Teaching in the Local College” project. During the thesis proposal, the author successively based the questionnaire, informal discussion seminar and literature collecting to get reform thinking about the computer technology on chemical engineering cartography teaching.

2. The Problems of the Teaching in Chemical Engineering Cartography Teaching in the Local College
The author successively based the questionnaire, informal discussion seminar and literature collecting with students, teachers and enterprises to find the problem about the chemical engineering cartography teaching. The result shown that there were mainly three matters.

2.1 The Changing about Class Hours of Teaching
It is the urgent problem which is waiting for college teachers to research how local colleges should develop the graduates who have morality, ideal, reasonable structure of both knowledge and ability. The
education of local colleges are inclined to rich creativity and higher running aptitude according to target in order to develop demand of "Thick Base, Wide Caliber and High Quality"[3] advanced by Educational Ministry.

The policies of local colleges were that increasing courses, practice and experimental training in this premise, college teacher’s face the questions that class hour is cut down and teaching content is increase. And then, because of the increased enrollment, the quality of students tends to fall.

Chemical engineering cartography which is an important specialized basic course of the chemical engineering and technology in local colleges face the same rules. The lesson of chemical engineering cartography was 56h every term in 2004, but it is only 30h per term. There are only 2 classes should set up chemical engineering cartography ten years ago, but there are 10 classes are learning this lessons. When the present university education allows a large scale of enrolling, a large number of students have been enrolled in local colleges, because of the increased enrollment, the quality of students tends to fall. But beyond that, the class hour is cut down and teaching content is increase. College teacher’s face that they should spent more times than ever because of the quality of students tends to fall, but as it is, they had less times because of the class hours not only increasing but also assigned to practical course.

### 2.2 The Changing of Social Demand

The chemical engineering cartography is the required subjects of Chemical Engineering Majors, it can bring up the capability of students about analysis of the drawings, drawing, and space imagination and lay the foundation for future practical work [4]. The chemical engineering cartography was used the traditional mechanical hand drawing. Raditional manual plotting is not only slow-rate and inefficient, but also quality unguaranteed. Computer software applications with speed, high accuracy, easy to modify the characteristics has basically replaced the manual mapping. To master and use mapping software skillfully can enhance the efficiency and quality of mapping. Now the Chemistry Majors requests that people can combine computer technology with chemical drawing. Therefore, how to teach and to use the computer graphics software become one of the focuses about the subject.

### 3. The Reform Measures in Chemical Engineering Cartography Teaching in the Local College

Computer technology includes the design and development of computer; the application of systematic research, development and application about other areas; the application of computer science and technical disciplines related theories, technologies and methods. Computer technology is the core technology in the information society, and it is one of the key technologies to modernize. As an emerging technology, computer technology experienced an unprecedented development in just a few decades, its application has permenated into, all aspects of life. The application of computer technology is changing not only the human production and way of life, and determines the new developments in many disciplines to some extent.

Chemical Engineering applies the natural (or experimental) sciences (e.g. chemistry and physics) and life sciences (e.g. biology, microbiology and biochemistry) together with mathematics and economics to produce, transform, transport, and properly use chemicals, materials and energy. Chemical engineering passed two mile-stones of the unit operation and mass transfer, heat transfer, momentum transfer and chemical engineering reaction [5]. After the 20th century, the computer technology played an important role in the development of modern Chemical Engineering. In short, the application of the computer technology played an important role in the chemical teaching.

### 3.1 The Application of Multimedia Technology to Teaching

By the chemical engineering cartography class hour is cut down and teaching content is increase. With the development of science and technology, the application of multimedia in instruction is improving now. It has brought new vital force and energy for class teaching due to the adoption of multimedia teaching means. Uses the multimedia teaching method is for arousing student's enthusiasm
well, makes students become the master of study. But if just use multimedia teaching, such as PPT and so on, it is shown that excess of message is instead of a bad one, which leads to confusion and a loss of efficiency. So we should use traditional teaching method by writing on the blackboard with multimedia teaching method, in order to teach according to the personalities, to organize the teaching and to improve students’ abilities of chemical engineering cartography study.

The students can learn by themselves by opening the network lessons in campus net in their spare time, the network lessons can publish on rain class which is launched by the Tsinghua University in WeChat.

3.2 The Application of Computer Drawing Software

Chemical engineering cartography is the required subjects of chemical engineering majors, it can bring up Th capability of students about analysis of the drawings, drawing, and space imagination and lay the foundation for future practical work. Now the Chemistry Majors requests that people can combine computer technology with chemical drawing. Therefore, how to teach and to use the computer graphics software become one of the focuses about the subject.

Autodesk’s AutoCAD[6]which is the most widely used at computer graphics software present includes the editing function, dimension and tolerance marking function, and CAD, this software can develop student's space imagination in drawing teaching and explain the difficult points such as intersection, interpenetration, regular expression. AutoCAD can be not only drewed plane figure but also solid figures. On the reasonable arrangement of AutoCAD curriculum at teaching method on chemical engineering. Chemical engineering cartography is a compulsory practice course for Chemical Engineering Majors, and mapping the mold assembly and the main parts of the map is an important part of course teaching. Many large-scale equipment can’t show objects, through pictures, models, multi-media and other means in order to facilitate students to understand and imagine.

4. Conclusion

Before the computer was popularized, the data statistics, data analysis and calculation on data of research cost a large amount of manpower and material resources. Now the large data statistics, data analysis and calculation on data of research are developing fast with the development of computer, network, artificial intelligence and distributed calculation technologies, which provides convenience to shorten the research period[7].

The computer technology brings great changes to research workers on chemistry. It raises opportunity and challenge for scientists to develop cross subject in a wider level. The computer technology will revolutionize the chemist on research and teaching, will play a more important role in scientific research in future. We should build our own internet platform, after all this technology is not only an efficient instrument but also a real challenge for every chemist.

Acknowledgements

This research was supported by the the instruction reform project of Baoji University of Art and Sciences (13JG29).

References


