Research and Practice of Precision Teaching of Non-professional Computer Courses Based on Big Data

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Abstract. In the teaching of computer courses, most schools still adopt the traditional teaching method; and then arrange the computer class, so that students can practice. This teaching method is not undesirable, but it is not suitable for some courses, especially those with strong operability, such as Word, Excel and so on in the foundation of computer culture. Because the operational content does not need to understand, for the students only formed perceptual knowledge, has not risen to a higher stage of knowledge - rational knowledge. Therefore, students are easy to forget, even if the teacher is to speak while operating, students in the subsequent computer class is also easy to forget the specific steps of the operation.

Keywords: Curriculum System, Computer Skills, Innovation Ability, Teaching Method

1. Introduction

Colleges and universities shoulder the responsibility of cultivating talents of the state, how to make non-computer students master the professional knowledge and skills, but also can use the computer too quickly and accurately find the information needed to use, and apply a variety of technical means and methods to the information acquired to choose, analyze, process, organize, store, send and share, in order to achieve the optimization of information effectiveness, colleges and universities training non-computer students are faced with the problem that cannot be ignored.

2. Current situation and existing problems of computer education for non-computer majors

2.1. Students' level is uneven

Although, for college students just entered the university gate, has said goodbye to the "zero starting point". However, due to regional and economic differences, there is still a certain gap between urban and rural middle school students' computer skills. Many students from good families have been
exposed to the computer before entering the university, and have mastered or have basically mastered some basic theoretical knowledge and operation skills of the computer. Students from remote areas have little or no access to computers[1]. In the face of such a practical situation, it is difficult for teachers' teaching design to meet the needs of students of different levels at the same time. The analysis of students' level needs to be applied to the construction of neural network and cluster analysis, and some formulas also need to be applied:

$$Err_j = O_j(1 - O_j) \sum_k Err_k W_{jk}$$  \hspace{1cm} (1)

Using the formula, this paper conducts clustering analysis on the actual teaching (j) based on the hierarchy. Such methods do not need to be given parameters in advance (cluster number k), but they need to terminate the condition, and the data graph shown in figure 1 is constructed:

![Cluster analysis of student level based on big data](image)

**Figure 1.** Cluster analysis of student level based on big data

We can find from the figure that at present, most of the computer courses offered by universities for non-computer major students are mainly the basis of computer culture, and some programming languages are offered on this basis, mainly including C language, V B, V F and so on. It is mainly aimed at first-year students. In the next three years, few computer courses were offered. And there are still some problems in the teaching process of computer course[2].

2.2. Students' majors are not combined

Computer courses offered by non-computer majors are separated from the major. All non-computer majors offer the same computer course without considering whether it is suitable for the major or beneficial to the development of students' major. For students who are not computer majors, the computer is not their major but a tool. The purpose of learning computer courses is to learn how to use computers to solve problems in their major and field. Therefore, emphasis should be placed on application. For example, we can lead students to build different kinds of decision trees in computer courses, so that computer courses can truly assist students in their majors (see figure 2):
At present, Chinese universities have generally strengthened the computer education for non-computer major students, but they seldom pay attention to the combination of content and the major, and do not treat the computer as a useful tool for the academic research of the major well, and only complete the imparting of textbook knowledge.

2.3. It is not conducive to the cultivation of students' information literacy

The concept of information literacy evolved from book retrieval skills. Since then, with the continuous development of information technology, its definition has been constantly expanded and evolved. At present, according to the opinion of most educational technology experts and computer education experts at home and abroad, information literacy should be the basic knowledge and practical ability related to "information acquisition, information analysis, and information processing and information utilization". In the process of teaching, teachers' pay too much attention to students' theoretical knowledge and basic operation. Although they explain the processing methods of information, they lack the cultivation of students' information awareness, and seldom combine specific tasks to inspire students to get useful information from the vast ocean of information.

3. Some suggestions to solve the problem of non-computer major computer education

3.1. Computer course system design for non-computer science students

According to the different level of students, the implementation of credit system, the school can be based on different professional computer courses. For example: the computer network, the database, the graph image processing and so on, the student may according to own computer foundation, the major, the hobby selects the appropriate course. Finally, you only need to complete the credits of the computer course.

We adopt the "1+X+Y" curriculum design scheme, namely "science computer foundation" + "science programming language" + "science computer advanced course (multiple courses)". The curriculum design is as follows:

3.1.1. Computer foundation of science: this course is a compulsory course of science. The purpose of this course is to introduce science students to the development of computers, the use and maintenance of computers, the knowledge of computer networks, and the use of common software. Through the
study of this course, it is hoped that students can be more skilled in using computers and truly use computers as tools in daily life and study.

3.1.2. Programming language for science: this course is a compulsory course for science. For non-computer science students, in addition to achieving proficiency in the use of computers, but also to learn some basic application basis such as programming, in order to at a deeper level with their own professional fields to use computers. This course teaches advanced computer application technology, including 7 modules: network, multimedia, database, VB, ASP, C language, Java. By combining these 7 modules, a total of 7 courses are formed, and students can choose one or two of them. These 7 courses are: network and multimedia technology, network and database technology, network and VB programming, database and VB programming, VB and ASP, C language programming, Java programming. Both classroom teaching and network classroom teaching methods can be carried out after the online review, homework, discussion, counseling answering questions and so on.

3.2. The teaching method should stimulate students' interest in learning

"Those who know well are not as good as those who know well, and those who know well are not as good as those who know well." this is a saying said by Confucius, the great educator of our country, who emphasized the importance of interest and explained that interest is an important motivation for learning. Psychological research shows that: curiosity and interest curiosity is the psychological basis of intellectual development. Only when students are interested in the content of learning and the way the teacher lectures, their thoughts will be highly concentrated and their learning efficiency will be greatly improved. Therefore, in the process of teaching, teachers can grasp these psychological characteristics of students to take appropriate skills to stimulate students' interest in learning. For example, you can adopt a "task-driven" approach. For example, the content of the class is to make PPT, the teacher can first give students a beautifully made and attractive PPT, to arouse students' interest so that students have a comprehensive understanding of the task; And then, step by step; Finally, students are encouraged to search for materials by themselves and use their imagination to make their own PPT, which they can enjoy and give guidance to in the next class. Through this kind of teaching method, can arouse the student's interest, satisfies the student's sense of achievement, thus may cause the student next time study the enthusiasm.

3.3. Focus on cultivating students' information literacy

Information literacy ability is a relatively stable information psychological feature established by students through the internalization and generalization of information knowledge, information skills and information strategies in information activities. Information activities are an important way for the formation and development of information literacy ability. At the beginning of the course, teachers should introduce the connotation of information literacy to students and emphasize its significance and importance to enhance students' information awareness. Then, in the teaching of this course, certain retrieval tools and retrieval knowledge are explained, and scientific methods and skills are applied to make students realize how to find the information they need from the ocean of information, so as to gradually improve their information literacy.

3.4. Combine students' majors and offer suitable courses
For non-computer major students, in addition to learning the basic theoretical knowledge of the computer and operating skills, should also be combined with this major to open some relevant courses, such as: mathematics major students, in order to meet the needs of this major, they can open some about text and text side by side and formula input software courses.

4. Conclusion

Non-professional basic computer education is to train a certain degree of computer application ability and certain information literacy of compound professional talents. For teachers engaged in computer education, they should keep forging ahead and keep pace with The Times, constantly update the teaching concept, teaching content and teaching means, arouse students' enthusiasm for learning, stimulate their interest in learning, and improve their information literacy, so as to meet the needs of the continuous development of society.

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