

Research on the Reform of Teaching Mode and Curriculum System of Computer Science and Technology Based on the Information Age

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Abstract: In the era of big data, information technology has been infiltrating in all walks of life and has played a pivotal role. In the field of education, information technology has gradually been widely used, and its application methods are becoming more diverse. Through the analysis of the role of information technology in the teaching of computer specialty, it is clear that this technology can mobilize the enthusiasm of students, and explore the development of the flipped classroom, practical innovation, Internet + cloud and Internet of things in the information age, so as to enhance the effectiveness of teaching.

1. Teaching Mode of Computer Science and Technology Based on the Background of Information Age

1.1 Actively Promote the Teaching Method Reform with “Flipped Classroom” as the Core

Specifically speaking, the two main parts of the teaching model are teachers and students, both of which are indispensable. According to the teaching process, it can be divided into three stages: pre class preparation, classroom teaching and after class teaching. Teachers and students in each stage have specific tasks, and the teaching structure model is shown in Table 1.

Table 1 Teaching Structure Model

| Teaching stage | Teachers' tasks | Students' tasks |
|----------------------------------|--------------------------------------|------------------------------------|
| Pre class preparation activities | Set teaching objectives | Learning and teaching resources |
| | Integrate teaching resources | Carry out data access |
| | Release learning materials | Summarize learning experience |
| | Teaching design | Form note document |
| Classroom teaching activities | Understanding the basics of learning | Accept knowledge content |
| | Difficult key teaching | Solve problems and puzzles |
| | Group cooperation practice | Applied knowledge training |
| | Q & A Summary | Exchange and discuss problems |
| After class teaching activities | Summarize teaching experience | Summary and consolidation exercise |
| | Arrange training resources | Active programming practice |
| | Comprehensive assessment of teaching | Regular comprehensive evaluation |

The specific operation is as follows.

Stage 1: pre class preparation:

For teachers, first of all, prepare the teaching objectives and contents of this class, sort out the important knowledge points of this class and the problems that inspire students to think about, and make it into “micro video” and PPT, and integrate teaching resources such as courses and documents. The study materials will be published to the online teaching platform one week before each class as a reference for students to learn before class. Secondly, the teacher designed the classroom teaching activities and arranged the specific implementation steps of the teaching.

For the student side, you need to watch the “micro video” in advance through the online teaching platform and read the PPT content. Understand and master the learning objectives and contents, be familiar with the basic knowledge points, understand the target knowledge points in many aspects, and seriously think about the questions put forward by teachers, and answer the questions put forward by teachers through data search. At the same time, summarize the learning content and learning experience, put forward the confused points in learning, form learning notes and report documents, and use them in the teaching, communication and discussion of teachers.

The second stage: classroom teaching activities:

First of all, the teacher explains the key and difficult points of this lesson and the doubts in the process of students' learning in a unified way. Secondly, design specific practical topics to organize students to study in groups, exchange discussion and collaborative development. Each group has about 4 people, and a team leader is selected. The team leader is mainly responsible for the task and practice result report of each member in the group. Here, the case of the practical topic designed by the teacher should not only include the knowledge points of this lesson, but also give consideration to the practicability and interest as much as possible. At the same time, it should pay attention to the comprehensiveness and coherence of knowledge application, and the follow-up knowledge should be based on the previous knowledge. Finally, through project defense and other ways to understand students' knowledge, evaluate whether students achieve the purpose of program development curriculum. Evaluate the project completion of the group, and strengthen key or difficult issues in the form of discussion, Q & A, report, etc.

For example, when teaching the definition and use of objects in Java programming, the design case should not only include the definition and implementation of objects, but also combine the previous foundation, such as java basic syntax structure and other programming language elements. It not only reviews the knowledge that has been learned before, but also cultivates students' systematic consciousness, helps students to build a knowledge system, and apply what they have learned.

For the students, they should take the purpose of listening to the questions in the self-study process before class, solve the problems and confusions encountered in the self-study process before class, and enhance the initiative and depth of receiving knowledge. In practice, communicate with group members or teachers in time to improve programming ability and problem-solving ability.

The third stage: after class teaching activities:

For the teachers, according to the performance of the students and the problems reflected in the teaching, summarize, timely improve the knowledge points and teaching methods of this lesson, and prepare for the later teaching. At the same time, teachers should promptly arrange the teaching practice tasks of the class in order to enable students to continuously consolidate the knowledge content they have learned.

For the student side, after the end of the classroom teaching, the students mainly strengthen their knowledge through after-school exercises and programming practices. In addition, students can exchange learning experiences through the online learning platform, ask questions to teachers and classmates, reflect problems encountered during the study in a timely manner, and promptly feedback the problems existing in the teaching process. Teachers sort out and summarize students' questions and answer questions online. Gradually form the after-school teaching communication mode with students as the main body, teachers as the leading role and based on the network platform, so as to realize the combination and unity of students' Online Autonomous Learning and network assisted learning.

1.2 Vigorously Carry out Multi-Channel Course Practice Teaching

Practical teaching is a very important way to improve students' engineering practice, innovation ability and engineering literacy, and it is also the key. However, the practice teaching methods based on teachers, experimental guides and laboratories in the current practice of colleges and universities have many limitations in supporting talent cultivation.

Carry out in-depth school enterprise cooperation, take “characteristic class” as the carrier, introduce enterprises to stay in school, introduce schools into enterprises, and integrate schools with enterprises

School enterprise cooperation is an important way to improve students' practical ability in Application-oriented local universities. Carry out in-depth cooperation with enterprises, so that the talents trained in Colleges and universities can go on duty smoothly when they go out of the school gate, realize seamless docking, and adapt to social needs. On the one hand, relying on school-enterprise cooperation, through corporate donation equipment, shared equipment and other channels, to make up for the shortcomings of the lack of practical conditions in the school development process, to build a platform for the school to carry out programming courses, create conditions. On the one hand, actively explore new corporate technologies, and aim to meet the needs of enterprises, and create school and enterprise joint construction classes.

Make full use of the resources provided by the Internet to carry out the practice

First of all, make full use of the teaching resources such as MOOC provided online to guide students' practice, and train students to acquire their own knowledge and their own hands-on programming skills. Second, make full use of the open source software provided by the Internet, allowing students to read high quality, open source software with a certain amount of code and functionality. On this basis, the open source software is maintained, its functions are improved, its defects are corrected, the code reading ability of students is improved, the basic style and requirements of high-quality program code are felt, the programming ability is further improved, and the quality of program writing is improved.

Relying on innovation and entrepreneurship practice project to train students and provide students with practical ability

Open some software related laboratories to provide students with resources and experimental platform for extracurricular learning. Students are encouraged to use the experimental platform to actively participate in various discipline competitions and college students' innovation and entrepreneurship projects. Through the application and completion of the project to train students' practical ability, enhance students' awareness and spirit of innovation and entrepreneurship, and exercise the ability of innovation and entrepreneurship.

1.3 Timely Update of Teaching Content

The development of computer technology, especially software technology, is very rapid. The setting of talent training programs, syllabus and course content often has a certain lag, which cannot meet the needs of society and industry for computer professionals. Therefore, it is necessary to revise the talent training program regularly, update the knowledge structure and the teaching content of the course.

1.4 Establish a Sound Curriculum Evaluation System

It is necessary to establish a comprehensive evaluation mechanism of computer course based on ability, and to open up the evaluation mechanism of theory and practice. Increase the assessment of practice links, develop a comprehensive practical curriculum assessment program, take students' practical ability and independent learning ability as the main assessment objectives, and take students' practical works as the main assessment content.

2. Research on Curriculum System Reform Based on the Background of Information Age

2.1 Curriculum Reform Innovation of “Mobile Internet + Education”

As one of the products of the popularization of the information age, there are many derivative platforms of the mobile Internet, such as wechat, Weibo, QQ and blog, which can bring a new support for the curriculum system revolution of computer specialty with the help of the rapidity and timeliness of the mobile Internet. At the same time, these platforms also gradually quit the app application based on mobile devices with the development of time. Every computer professional

student can have a comprehensive understanding and understanding of computer professional learning and curriculum system reform through the new teaching mode of “mobile Internet + education”. Secondly, in teaching methods, we advocate the interaction of teachers and students on WeChat, blogs, Weibo and other online platforms to carry out innovations and innovations such as “WeChat teaching” and “Weibo teaching”. At the same time, qualified schools can also create a new teaching system for higher vocational computer courses by introducing interactive forms such as “flip classroom”. Finally, when assessing student learning outcomes, we advocate that teachers should fully utilize the mobile Internet APP platform to implement classroom back-office assignments and virtual platform performance announcements to establish a new curriculum assessment ecosystem.

2.2 Curriculum Reform and Innovation of “Cloud + Education”

As a new educational concept derived from the information age, “cloud + education” can be understood as a high degree of integration between cloud computing and intelligent terminals. Therefore, in the process of dividing the computer professional course into the “cloud and terminal”, we can carry out new features through the curriculum planning and curriculum implementation of the computer major. In the specific teaching process, the computer teachers of higher vocational colleges should also make full use of cloud computing technology to create some virtual cloud teaching platform. In the internet teaching mode of offline teaching, online operation, middle end sharing and cloud storage, a brand-new learning road is opened for college students.

2.3 Research on Curriculum Reform of “Internet of Things + Education”

As an extension of M2M concept, “Internet of things + education” mainly includes three parts: transmission layer, perception layer and application layer, and it is also feasible to introduce this kind of Internet of things concept into the actual classroom education revolution of computer specialty.

3. Conclusion

In conclusion, the advent of the information age not only provides the driving force for social progress, but also lays a new opportunity and vitality for the promotion of the computer science and technology professional classroom in the whole university. In view of this, every university should seize the opportunity to introduce organic integration of computer professional classes through the introduction of cloud computing, mobile Internet, Internet of things and other “Internet + education” derivatives. In the process of constantly pushing through the old and bringing forth the new, we have developed a professional curriculum system that meets the needs of the development of the computer industry, so as to let the computer professional curriculum teaching develop and grow with the help of the favorable opportunity of practical development.

References

- [1] Academic Affairs Office of Fudan University. The seminar on the development strategy of Engineering Education in comprehensive universities was held in Fudan University [EB / OL] (2017-02-18), [2017-08-18]. [Http://news.fudan.edu.cn/2017/0218/43133.html](http://news.fudan.edu.cn/2017/0218/43133.html).
- [2] Department of higher education, Ministry of education. “New engineering” construction action line (“Tianda action”) [EB / OL] (2017-04-12), www.moe.edu.cn/s78/a08/moe_/201704/t20170421_.html.
- [3] Ministry of education, “Beijing Guide” for new engineering construction [EB / OL] (2017-06-10), [2017-08-18]. www.moe.edu.cn/jyb_xwfb/gzdt_gzdt/moe_/201706/t20170610_.html.
- [4] Li Deyi, Ma Nan. New engineering in the age of intelligence -- the practice of artificial intelligence promoting education reform [J]. Higher engineering education research, 2017 (5): 8-12.