Research on the Teaching Mode of Flipped Classroom of University Computer Under "Internet +"

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Abstract This article in view of the current computer basic education present situation, under the background of "Internet +", combined with advanced information technology and demand of applied innovative talents training of higher education and teachers in a line of actual teaching experience, put forward the "Internet +" under "university computer" turn into the classroom, explore the teaching mode that suit the development of students, enhance students' motivation in learning, to promote the cultivation of interdisciplinary talents.

Keywords University Computer, “Internet +”, Flip the classroom, Teaching mode

1 Introduction

The development of information technology promotes the reform of higher education, which is bound to keep pace with The Times. Computer basic education in the "Internet +" under the guidance of action, should change the traditional teaching mode, actively integrated into the national higher education development strategy, and actively explore new teaching mode, to adapt to the society for the cultivation of applied talents demand as the guidance, to foster has a certain theoretical level and master computer application skills as the goal of teaching mode. Based on the analysis of the current situation of basic computer education in universities, this paper studies and explores the teaching mode of university computer course with the help of new information technology means such as "Internet +" and "flipped classroom", so as to promote the development of basic computer education.

2 Characteristics and current situation of basic computer education in universities

Under the "internet +", information technologies such as big data and cloud computing surround our life and study all the time. Basic computer education has gradually started in middle school or even primary school. However, in view of the current situation of higher
education, the mastery of computer knowledge of college students is seriously out of line with the arrangement of information technology at various stages. The goal of computer basic education is to cultivate students' ability of computing thinking, the ability to solve practical problems in various professional fields by using the theory and technology of computer science, and to cultivate innovative and applied talents.

2.1 Three core characteristics of basic computer education

First, the basic computer education is oriented to the actual needs, and the basic computer teaching is aimed at non-computer majors who have just entered the door of higher education institutions. Considering who to train, how to train and for whom, the basic computer teaching helps students improve their autonomous learning ability, application innovation ability and team cooperation ability;

Second, there are many basic knowledge points of computer, "many"-the basic knowledge of computer involves all aspects of computer field, such as computer hardware, computer software, algorithm, data structure, program design, computer network and so on. "Live"-the teaching of basic computer knowledge is oriented to different professional objects, and professional-oriented teaching cases should be adopted;

Finally, strong practical ability requires strong practical operation ability and practical time.

2.2 The current situation of computer basic education is mainly manifested in the following three aspects

First, in the process of imparting computer knowledge, considering the arrangement of basic computer knowledge in different regions, students' computer level is uneven and there are big differences. Some students are even afraid of computers, and their self-confidence in computer learning is not strong;

Second, the development of information technology has always been ahead of the compilation of teaching materials, and the content of teaching materials lags behind, which makes students lose interest (see Figure 1 for the distribution of factors affecting students' learning efficiency), which seriously affects students' enthusiasm for learning.

Third, the traditional teaching mode of "teaching" and "learning" has a deep influence, so that teachers occupy a dominant position in the classroom, and students are basically in a passive position, unable to learn at their own pace.

![Figure 1. Distribution diagram of factors affecting learning efficiency.](image)
3 Research and exploration on the teaching mode of college computer course under the turn of "internet +"

College Computer, as the first general compulsory course for non-computer majors in colleges and universities, plays a vital role in students' comprehensive quality, thinking mode, innovation ability and autonomous learning ability. Thinking-based college computer course is comprehensive and practical, and it is a solid foundation for all majors.

3.1 Teaching content

The course of "University Computer" has obvious characteristics from the content involved: on the one hand, the connection between knowledge points in different chapters is not strong, and the selection of knowledge points in different chapters can be strengthened according to different majors; On the other hand, there are many knowledge points, which can be easily grasped and easily forgotten.

3.2 Teaching mode

College Computer is a highly operable course. The new teaching mode breaks the traditional mode of speaking while listening, adopts the teaching mode of speaking while practicing, and adopts various information technology means under the "internet plus" to carry out diversified teaching with the help of multi-resource platform. The specific teaching mode is explored as follows:

First, the chapters of intuitive knowledge points

For example, in the teaching of computer hardware, with the help of physical display, such as disassembling the computer main chassis, the components will be displayed and assembled, so that students can have an intuitive feeling and understanding of computer hardware knowledge points, and its effect will be better than the traditional concept plus theory teaching, and at the same time, students' learning interest can be firmly grasped to improve their learning efficiency.

Second, chapters with many knowledge points and easy to understand

Under the "internet +", with the help of related auxiliary learning platforms, such as classroom school, the specific operation has the following three steps: a. "Pre-class stage", teachers record relevant content into small videos and supporting presentations, and put them on the auxiliary teaching platform, so that students can learn independently before class; B. "Classroom test", in the class, teachers aim at the knowledge points in the small video files recorded before class, and check the effect of self-learning before class in the form of test questions, and further explain and show the knowledge points and key contents with high error rate, so as to solve the key problems in the limited classroom; C. "after-school tracking", reflecting on the knowledge points learned in time, and teachers will recommend relevant high-quality resources such as open classes and excellent courses, so that students can search for information they are interested in from massive network resources.

Third, chapters with difficult knowledge points

For example: programming and algorithm, etc. First of all, preview before class. Teachers record short video files of relevant knowledge points in this chapter in advance, usually 5-10 minutes, and put them on the auxiliary teaching platform. Teachers' pre-class tasks are usually given 2-3 days before class. Let students have enough time before class to study fragmentation without time and geographical restrictions; Secondly, introspection before class, on the basis of preview before class, teachers ask questions and give students a chance to challenge themselves; The third class teaches, then walks into the classroom with
semi-finished products, listens to the difficult and difficult explanations in the classroom teaching stage, and breaks through the questions before class one by one. The teacher is no longer a teacher but a leader, highlighting the student's dominant position. Some contents exchange roles (such as binary conversion and data coding); Fourth, after-school development, for example, after the loop structure in the program design chapter is finished, the teacher will make some Flash for students to visualize abstract questions and stimulate their interest in learning. For students with strong ability, the teacher recommends related micro-courses, develops knowledge, and stimulates students' thirst for knowledge, which can get twice the result with half the effort (as shown in Table 1, the distribution map of the help degree of the auxiliary teaching platform); Finally, the course reflects and walks out of the course. The timely reflection after class is to further study the content and encourage students to participate in the corresponding competition, so as to show themselves and improve themselves in the competition.

Table 1. Distribution diagram of help degree of auxiliary teaching platform.

| Item   | 75%-100% | 50%-75% | 25%-50% | 0-25% |
|--------|-----------|---------|---------|-------|
| Percentage | 16.2%    | 39.7%   | 31.8%   | 12.3% |

At the same time, the related syllabus, electronic lesson plans, courseware, teaching videos, course exercises, experimental guidance, reference catalogue and other contents are pushed at any time through QQ, FTP and other platforms. The use of the auxiliary teaching platform is convenient for students and teachers to discuss the problems they encounter, and put forward new and more efficient solutions. While thinking about other people's problem-solving ideas, students also broaden their thinking, get inspiration, and even think out better methods unexpectedly. Based on the use of the "internet plus" mobile platform, teachers and students are helped in many aspects. The process of classroom teaching is transferred to pre-class (changing with the time of extracurricular homework to ensure that the learning time and burden are not increased), ensuring that students can master the pace of learning. With the support of the online learning platform, teachers can master the information of students' pre-class learning and design more classroom teaching activities; free classroom time, complete homework, and give students' interactive learning and inquiry learning, cultivate critical thinking and innovative ability, and develop students' wisdom. However, in the whole teaching process, there is a gap between the thinking logic of teachers' teaching and that of students' learning, which requires teachers and students to make changes and progress together and continue to explore more effective teaching methods.

Finally, professional-oriented and case-driven

From the actual needs and tailor-made cases, differentiated teaching, to meet the needs of different majors, so that students can learn something and use it all. "internet plus" and "flip" provide a communication bridge between teachers and students, make better interaction between teachers and students, and improve students' autonomous learning initiative, creativity and teamwork.

3.3 Assessment method

The exploring teaching mode puts forward a new curriculum assessment. In addition to the traditional final exam, the new mode of "University Computer" adds process control assessment, which fundamentally solves the mechanization mode of the original assessment mode, provides students with more room to play, and cultivates students' innovative consciousness and autonomous learning ability. The proportion of each part is: final exam
(paper form) (50%) and autonomous learning (15%), after-school interaction (10%), classroom discussion (20%), and expanding works (5%).

(1) Final exam: basic knowledge, basic concepts and basic theories;
Closed-book written examinations are adopted: multiple-choice questions, fill-in-the-blank questions and analytical design questions. Selection and fill-in-the-blank questions mainly assess the basic concepts and theories, and analysis and design questions involve the conversion of the system, algorithm analysis and design, data structure and so on.

(2) Autonomous learning: preview and test before class, answer questions before class, etc.;
Two days before class, prepare homework. During class, the students will be sent by the classroom for assessment. Examples will be given to explain the knowledge points with more problems in detail.

(3) After-school interaction: communicate with teachers, communicate with classmates, and answer after-school questions;
The interactive link is mainly through QQ group discussion, ordinary individual discussion, and designating one day every week as the time for answering questions, and setting up online question-and-answer discussion.

(4) Classroom discussion: the completion of group discussion and practical homework;
According to different chapters, complete an assignment in groups, and cultivate the ability of teamwork, teamwork and innovation. Such as algorithm design problems, shortest path problems, etc.

(5) Expanding works: expanding practice of related knowledge points after class.
According to their own interests and hobbies, individuals choose their favorite chapters for the whole knowledge point to design a work freely.

4 Conclusions

The implementation of the flipped classroom under the "internet +" has created a brand-new teaching mode for basic computer teaching, which is conducive to the cultivation of students' comprehensive and practical computer skills, and also promotes teachers' teaching level and scientific research and innovation ability.

5 Project support
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