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# Research and Practice on the Teaching Mode of C Language Programming Based on "Internet Plus"

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**Keyword**: Flipped classroom; Information technology; Teaching model; C language programming

**Abstract**. With the development of computer technology, network technology and communication technology, "Internet plus" has penetrated into all aspects of our work, study and life, especially in the field of education. "Flipped classroom" is a kind of humanized teaching methods, its teacher and student interactive teaching as the main breakthrough, through the C language programming practice to stimulate students' interest in learning and training students practical ability. In the course of study, students need to practice through the relevant technical operation ability. The use of "flipped classroom" teaching mode, in the classroom to the real C language program design as the starting point, so that students divergent thinking, innovation, not only can improve the classroom teaching effect and students to master the knowledge and ability to solve the traditional teaching group education And the difference between individual differences. In this paper, the "C language programming" course as the object of study, first of all, "flipped classroom" teaching system needs analysis, select the appropriate technology for system development, followed by "Internet plus" under the "flipped classroom" mode Teaching system design, the use of information technology, network technology, multimedia technology and other modern teaching methods, to achieve "flipped classroom" teaching research and practice.

## Introduction

"Internet plus"[1-3] in the field of education is a milestone in the development of modern education. With the support of information technology, modern teaching mode is more and more popular among universities and students. In particular, the computer science and technology, electronic science and technology, software engineering and other information technology applications more frequent disciplines, which involves a variety of computer languages, including: commands, functions, tags, attributes and elements, and through the computer Strong operation. It is difficult to understand the programming language, and the practical ability is weak, so the use of "flipped classroom" [4-7]teaching so that students can directly participate in the real C language programming[8-9] and development, so that students find software design, Program development, simulation and other knowledge of the breakthrough. C language as a basic course of computer programming, in the "Internet ten" era of flipped classroom teaching mode application has very important practical significance.

## "Flipped Classroom" Teaching Mode

"Flipped classroom" is mainly to study the time of theoretical study and practice learning, student self-learning theory, through textbooks, teaching video to complete the theoretical knowledge of learning in the classroom teachers according to the degree of student learning C language programming practice homework, so that students can master the theoretical knowledge digested into personal ability. Compared with the traditional classroom teaching theory, students go home to do the opposite way, so called "flipped classroom". "Flipped classroom" is characterized by improving students 'ability of autonomous learning, enhancing the interaction between teachers and

students, so that theoretical knowledge and practical application of combining to improve students' practical ability to cultivate technical talents have a very good effect. At present, we have learned a lot of professional and computer technology, network technology [10]is closely related, and requires students to master the actual operation skills, teachers alone to impart theoretical knowledge, students can not really understand the actual C language programming specific operational processes and curriculum applications. And the use of "flipped classroom" teaching system through the combination of ladder theory and practice so that students fully understand a C language programming from scratch to the process, and through the discussion between teachers and students, the cooperation between students to complete Specific C language programming, not only to enhance students' ability to operate, but also to cultivate students' interest in learning, improve students' sense of honor and mission.

## "Internet Plus" Under the "Flipped Classroom"----"C Language Programming" Teaching Model

In the C language program design in the learning process, students' learning content is the main application object computer, learned the technology as computer software programming development. The curriculum content involves many function, command, grammar and structure, and adopt the way of traditional precept or teaching, students learning more difficult. "Flipped classroom" teaching model is set up, therefore, the development of teaching platform based on "Internet plus", on the one hand, by watching video teaching can make students learn the basic contents of the development of the C language program, on the other hand to let the students understand sexual training directly, through the teaching platform for program design, students in the process of distribution design, shows that the training results by stages, gradually cultivate the students' learning interest and make students master the C language program design method of study, improve the students' ability of autonomous learning. Students through the "flipped classroom" teaching platform in the process of self-study, if can't understand and can't grasp knowledge, can direct feedback through the platform, teachers can be targeted according to student common problem of lectures, which can improve the students' learning course of progress, a better knowledge of C language points.

C language programming teaching curriculum full use of computer technology, network technology, build a teaching platform, the platform is divided into two parts, one part is the pre-class student autonomous learning module, the other part is the classroom puzzled solution module. In this process, by the information technology and activities to learn pre-class self-study and classroom solutions, "flipped classroom" teaching model shown in Figure 1:

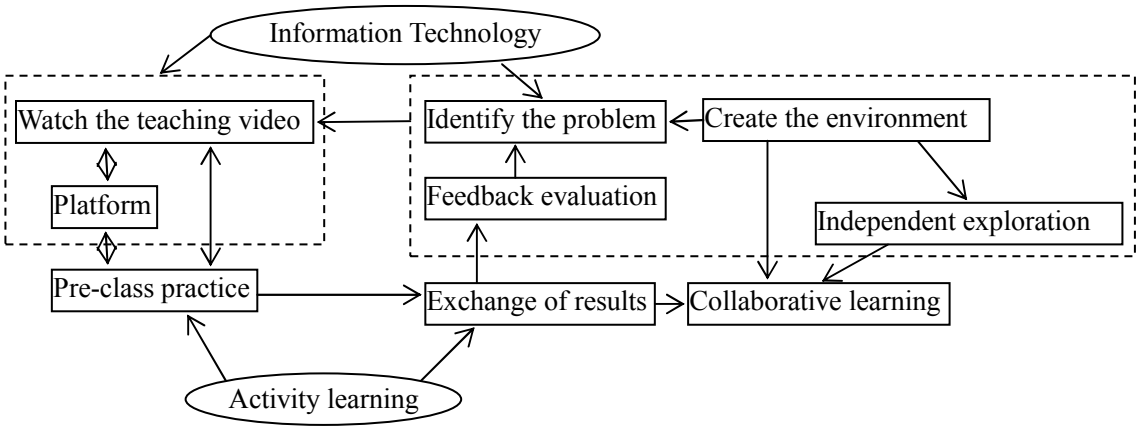


Figure 1 "Flipped classroom" teaching model

Under the "flipped classroom" teaching mode, teaching students through the information exchange platform to watch video, contact before class, when the difficulties and problems, through the platform back to the backstage teacher, the teacher after the problem determination, in the

classroom for students to create for C language programming problem and the difficulty of teaching environment, to help the students finish the difficulty for training, final results for students to communicate, feedback and evaluation.

## "Internet plus" era under the "flipped classroom"----Analysis on the Demand of "C Language Program Design" Teaching Platform

"Internet plus" under the "flipped classroom" teaching platform needs mainly include teacher needs, student needs and the needs of teaching materials and media .

**Teacher Needs.** Teachers through the "flipped classroom" teaching platform can be based on student characteristics to develop language programming teaching content, through streaming media technology so that teachers can interact with students to establish interaction. Teachers can learn the content through the platform, teaching media, autonomous learning methods for the overall design, the establishment of interactive mode, through the established learning process so that students from shallow to deep knowledge of the master. In the process of language programming classroom teaching, teachers focus on the problems encountered by students self-study, and to help students complete the course content of learning. After the end of the course, through the platform for language programming stage of learning to sort out the knowledge and assessment for students to evaluate.

**Student Needs.** Students are "flipped classroom" teaching platform application of the main body through the platform students can take the initiative to carry out language programming knowledge and understanding. Through the platform to increase the time and opportunity for students and teachers to communicate with each other, the original way of education from the classroom extended to the extracurricular, increase students' learning opportunities, so that students can more efficient learning, but also can help teachers understand each Students' learning language programming progress and knowledge of the situation. Students can according to their own learning habits and learning interest to adjust the order of knowledge learning, skip the knowledge of the content can be skipped, focus on learning unknown knowledge.

**The Needs of Teaching Materials and Media.** "Flipped classroom" teaching platform materials can be derived from the Internet excellent language programming teaching course ware. In the information technology support, teachers can combine the school materials, and then refer to extracurricular materials, to produce suitable for teaching students of teaching materials to help students correct and rapid knowledge of the master. Platform dynamic interactive function application of multimedia network courses, answer libraries, theme forums, online Q & A network media technology, so that students from the auditory to the vision of a full range of learning, and in the form of text, image form, audio and video Form the type of teaching, so that students can choose the most acceptable way to learn.

## "Internet Plus" Era under the "flipped classroom"---- Teaching Practice of "C Language Program Design"

In the "C language programming" teaching practice, the development of "Internet plus" based on the flipped classroom teaching platform is to achieve "flipped classroom" teaching practice basis.

**Key Technologies.** In this paper, the B / S model is used to design the three-layer network structure. The system is divided into presentation layer, application layer and database. The presentation layer implements the user interface layout. The application layer implements the system function application and the database storage data. Based on. Net platform for development, the database using SQL Server, the development language for C #, ADO.NET to complete the data interaction. In the database division, the main part is divided into two parts, one is the student application as the core of the course self-study part, the second is the classroom C language programming design as the core of the classroom teaching part. The course self-study part is divided into video teaching module, pre-class practice module, classroom C language programming module is divided into teaching environment, the results of communication and problem feedback

module. Video teaching module to establish a teaching video form, including video sp_nID, video name Sp_name, video connection sp_nURL, video classification sp_nclass, pre-class contact module to establish practice lx_ID, practice name lx_ name, practice content lx_content, question question. C language programming design module to establish C language programming xm_id, C language programming type xm_type, C programming language design name xm_name, C language programming content, xm_content, answer feedback and results exchange form.

**"Flipped Classroom" Information Platform Design.** "Flipped classroom" information platform mainly includes pre-class self-learning module and classroom activities module two parts. Self-study module is a student in the extracurricular self-learning tool, students use the "flipped classroom" information platform to watch C language teaching video and C language teaching case targeted practice. The classroom activity module is a teacher in the classroom for students to learn C programming problems encountered in the special training, to consolidate the students 'knowledge, and to the students' learning outcomes of the objective evaluation.

"Flipped classroom" information platform pre-class self-learning module design. "Flipped classroom" information platform pre-class learning module, including teaching video and curriculum targeted practice two parts. Teaching video is best recorded by the teacher personally, you can also use the network of excellent open source education video, video content and teachers set the teaching content and teaching objectives to match, for the same level of students to record a variety of versions, to enable students In the process of learning C language from shallow to deep self-study. Teaching video design to meet the students' learning ability, in an illustrative manner to enhance the visual effects of teaching, video content focus on C language programming practice exercises, and with the interpretation of voice, so that students can personally learn as a general learning. Teaching video in the time control to teaching point for the boundaries of each video does not exceed 20 minutes after the students watch the teaching video, the video content for self-practice, the results connected through the platform back to the background, can help teachers to keep abreast of Students master the degree of knowledge.

"Flipped classroom" information platform classroom activities module design. "Flipped classroom" information platform classroom activity module is with the students self-learning C language encountered difficulties and problems in the classroom teaching, teachers can focus on students in the C language programming problems encountered in the establishment of training, create personality The teaching environment, so that students independent exploration, teacher-assisted guidance, training students independent knowledge system structure, play the students creativity and imagination, between teachers and students, students and students can be specific to the language program for discussion , And put forward a variety of problem-solving methods, so that the classroom more active and vivid. The "flipped classroom" activity module also has a feedback function to create a file for each student's academic performance. The file can be self-evaluated by the student and can be used to practice the student's academic performance.

## Conclusion

In the "C language programming" teaching process, "Internet plus" under the "flipped classroom" teaching mode, the traditional classroom theory study, after-school homework, into after-school learning theory, classroom C language programming practice , So that students can solve the problems encountered in the theory of self-study classroom, improve learning efficiency, and this teaching methods, so that different learning ability of students in different stages to learn new knowledge, classroom teaching content through video, C language Program design works, etc., even if the students can not keep up with the progress of teaching, but also through the future efforts to complete the learning content. At the same time, C language programming "flipped classroom" teaching practice for the students to complete the independent completion of C language programming, improve the frequency of interaction between teachers and students, the establishment of a good classroom atmosphere has a very good effect.

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