ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202501_8(1).0014

Research on the Teaching of Information Technology Based on The Mixed Teaching Mode of Rain Classroom

-- Take "for Circular Application" as An Example

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Abstract

With the rapid development of Internet technology and education informationization, blended teaching has been widely concerned as an important way to promote the reform of education and teaching in the new era.This paper first analyzes the current situation of blended teaching and the problems existing in the information technology classroom,and then extracts the "for cycle"section from the high school information technology curriculum as an exploration.Finally,combined with the current rain class App from the three links of the "rain class"blended teaching in the high school information technology classroom teaching exploration.

Keywords

Rain classroom; Mixed teaching; High school information technology.

1. Introduction

With the rapid development of our country,our country has changed from a manufacturing power to a creative power,which also puts forward higher requirements for our experimental teaching,that is,to meet the needs of training creative talents in teaching,but also to adapt to the internationalization of our country.In February 2016,the Horizon Report of Higher Education clearly pointed out that the design and application of blended learning will be one of the important trends in the development of higher education in the future[1][2].In addition,the innovation and development of the educational concept of "Internet education"has made information technology widely used in teaching[3]."Internet+education" provides "always can learn,everywhere can learn" environmental conditions,reflecting the "online and offline combination"distinct characteristics[4].The"Ten-year Development Plan for Education Informatization (2011-2020)"puts forward that "narrowing the gap in basic education resources"is the primary task of basic education informatization.The above represents the upward and incremental development of China's digital educational resources construction.

Currently, information technology has been widely applied in various industries, and schools are adopting various information technologies to improve teaching quality. In recent years, new teaching methods such as MOOCs, micro courses, and flipped classrooms have emerged, providing new ideas for curriculum and teaching reform. Blended learning is a teaching method that combines traditional classroom teaching with online teaching. It is a deep integration of information technology and curriculum, representing a new teaching philosophy[5]. The blended learning model can effectively improve teaching effectiveness, increase students' interest and enthusiasm for information technology courses, and help cultivate students' self-learning and self-management abilities. Compared to traditional classrooms, in blended learning mode, there is an increase in interaction and communication between teachers and students, which is conducive to timely identification of problems and personalized teaching, thereby improving students' learning efficiency.

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2. Current Problems in Information Technology Teaching

Regarding the subject of information technology, some scholars have mentioned that the level of attention given to high school information technology is generally not high[6].Ma Hailong mentioned that many information technology teachers' awareness cannot keep up and they neglect teaching effectiveness[7].Fan Limei mentioned the current situation of relatively lagging information technology teaching resources in underdeveloped areas[8].These all express the problem of unbalanced and insufficient development of high school information technology curriculum. In addition, there are relatively few high school information technology class hours, and the original teaching methods are used, with teacher classroom lectures as the main focus, supplemented by homework after class, making it difficult to delve into the key teaching content[9]. Insufficient interaction and communication between teachers and students, unable to fully mobilize students' learning enthusiasm and initiative. The original teaching method cannot truly test students' transformation from knowledge to ability. Although it adopts the evaluation method of regular grades, experimental grades, and exam grades, the final exam grades are still the main focus. It is impossible to test whether students have truly mastered and understood the knowledge points or obtained them through pre exam cramming, and it is also unknown whether they have truly understood the relevant knowledge and have corresponding practical abilities.

Therefore, how to enhance the activity of teacher-student interaction and the effectiveness of classroom teaching, achieve the transformation from "teacher centered" to "student-centered", and improve the comprehensiveness and authenticity of student learning effectiveness and self-learning ability evaluation, is an urgent problem to be solved.

3. The Concept of Blended Learning Mode

In 2004, Professor He Kekang, a well-known scholar in the Chinese education industry, first proposed the concept of blended learning[10].He emphasized that blended learning should fully combine the advantages of traditional learning methods and e-learning, aiming to give full play to the guiding, inspiring, and monitoring role of teachers in the teaching process, while highlighting the enthusiasm, initiative, and creativity of students as learning subjects. This hybrid teaching mode is formed in the "Internet plus" environment, which organically integrates network information technology and educational practice, takes advantage of the combination of open online platforms and traditional classrooms, gives full play to the advantages of online and offline teaching, breaks the space-time constraints of traditional classroom teaching, and provides students with more diversified and personalized learning experience.

4. The Construction of Blended Learning Mode

Blended learning based on Rain Classroom is a teaching model that organically combines online and offline classrooms. This model combines online resources such as classroom content, assignments, and materials with offline practical activities, group discussions, and project practice through the use of online classroom platforms such as Rain Classroom, in order to improve students' learning outcomes[11].This teaching model emphasizes the subjectivity of students in the learning process, giving them more freedom to choose the learning method that suits them. Students receive new knowledge in online learning before class and internalize it in offline courses, thereby gaining a deeper understanding of the knowledge they have learned. Fully utilizing the advantages of online and offline teaching, and based on students' learning patterns, design a blended learning curriculum system based on Rain Classroom, as shown in Figure 1. It is mainly divided into three modules: self-study before class, offline teaching during

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class, and post class consolidation and reflection. A multidimensional knowledge system can achieve comprehensive personalized teaching for students, and evaluate teaching quality and effectiveness through multiple assessment methods, cultivating students' comprehensive abilities in multiple aspects.

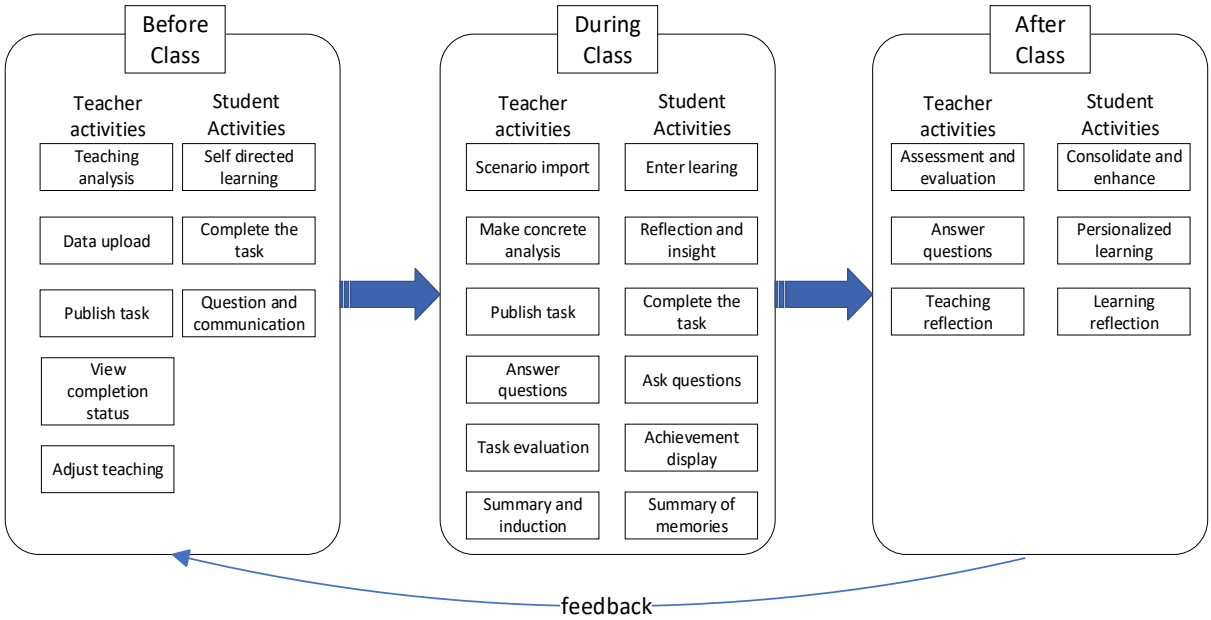


Figure 1. Design of blended learning curriculum system based on Rain Classroom

4.1. Student Analysis

Elaborate on the information technology learning situation of high school students from two aspects: cognitive style and learning foundation.

Cognitive style: Different students have different cognitive styles, which can affect their learning and application of information technology. Visual students: enjoy learning through observation, visualization, and visual aids. They may prefer to operate through a graphical user interface (GUI) and are more interested in visual tools such as images, charts, and presentations. Auditory students: enjoy learning through listening, explanation, and auditory methods. They may be more inclined to learn information technology through online teaching videos, audio explanations, and speech recognition software. Kinesthetic students: enjoy learning through hands-on practice and interactive participation. They may be more inclined to engage in programming practice, application development, and experimental operations to understand and master information technology through practical operations. Combining online and offline teaching through Rain Classroom can maximize the satisfaction of students with different cognitive styles.

Learning foundation: Some students may already have a certain level of information technology foundation and be able to quickly grasp new knowledge and skills. For some students who lack foundation, it is necessary to start with basic knowledge and gradually improve their learning ability. Students' learning motivation and interest can also affect their learning of information technology. For students who are interested in information technology and actively learn, they may be able to master relevant knowledge and skills faster. For students who lack learning motivation and interest, it is necessary to stimulate their learning interest and provide attractive learning content. To better achieve personalized teaching, teachers need to make timely adjustments to their teaching plans based on data feedback from the pre class, in class, and post class stages of Rain Classroom during the teaching implementation process.

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4.2. Teaching Design

4.2.1. Preparation before class

In order to fully utilize classroom time for knowledge application and expanded learning, teachers should conduct teaching analysis in advance, select appropriate teaching materials, and publish relevant learning videos, preview self tests, and teaching task announcements in Rain Classroom, allowing students to obtain relevant learning materials in advance. Students can receive and complete corresponding learning tasks in a timely manner through Rain Classroom, and communicate and ask questions in the discussion area. Teachers can also track students' online learning progress through Rain Classroom and adjust classroom teaching strategies based on analysis results at the end of the semester to better meet students' learning needs.

After receiving the courseware on their mobile devices, students immediately start previewing and learning. Mobile courseware comes in various forms, including videos, images, text, and other content. Teachers will assign tasks and requirements that students need to complete, guiding them to conduct research on specific issues. In class, students will be encouraged to speak independently, share their problem-solving ideas, methods, and personal thoughts. This teaching method can not only achieve twice the result with half the effort, but also increase the fun of teaching, stimulate students' interest and participation in learning.

4.2.2. Classroom teaching

Step 1: Introduction of Rain Classroom Scenarios

Teachers ask students to speak and discuss the questions raised in the preview courseware. Guide students to summarize and come up with solutions through their speeches. Teachers and students work together to solve the problems raised in the preview courseware:

Xiao Zhi wants to buy a handwriting board for drawing, so he saves money in the following way:

On the first day, deposit 1 yuan,

On the second day, deposit 2 yuan,

……

Deposit 5 yuan on the 5th day.

Please calculate and output the total amount of money in the piggy bank after 5 days?

Step 2: New Lesson Teaching

Analysis of the problem: Manually reproduce the process according to the question, and list the variables stored in (i) and the total value (s) in a table. The teacher guides students to think step by step and fill out the table, and visually represents it with courseware, as shown in Figure 2.

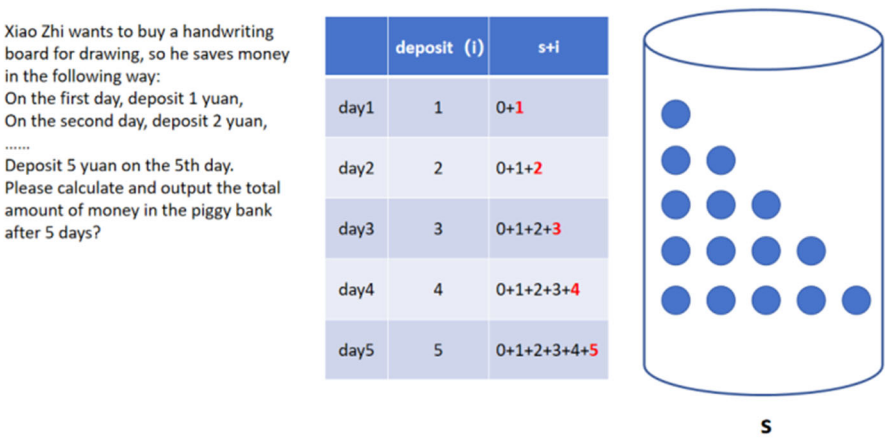


Figure 2. Process of Analyzing Problems

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Problem solving: Through the for loop statement learned in the previous class, let students try to implement problem solving in code form. And upload the answer to Rain Classroom. Let students experience the concept of accumulation.

Afterwards, send exercises through Rain Classroom: Refer to Exercise 2 for code programming to calculate R=5 * 4 * 3 * 2 * 1

And send a thought-provoking question through Rain Classroom: Is the initial value of R zero?

Students can send their answers through bullet comments or submissions, and teachers can share the answers of students who answer correctly with each other.

Classroom feedback: After students finish their exercises and click submit, teachers can directly view their progress in class. Through timely feedback in class, teachers immediately understand students' mastery of knowledge and make rapid adjustments based on the situation. After completing the exercises, randomly select one student for teacher-student interaction to understand their thinking process. Based on the student's answers, the teacher will summarize and generalize them.

4.2.3. Post class feedback

After the course ends, teachers can view students' attendance rates, overall response to questions, and a list of students with excellent or poor performance through the Rain Classroom mobile app. Based on post class data, teachers can adjust teaching strategies and methods in a timely manner to achieve optimal teaching results.

Students complete their homework through Rain Classroom. Teachers send homework through mobile courseware and set the submission time in the courseware. After students receive their homework on their mobile devices, Rain Classroom will promptly remind them to complete it.

The above is a teaching design based on the application of "for loop" in the information technology course under the Rain Classroom.

5. Summary and Outlook

The learning path established on mobile learning platforms is more personalized and continuous. This article proposes an online asynchronous course and offline synchronous course teaching mode, which enhances students' self-learning ability, hands-on practice ability, and innovation ability. And gradually, a teaching standard combining online and offline blended learning for information technology courses has been formed, which is a teaching mode that integrates scale, networking, and personalization, allowing students to complete the learning process of online learning and diversified management with the support of digital and intelligent learning methods. Based on current research, I believe that the blended learning model based on Rain Classroom can focus on the following three aspects.

5.1. Choosing teaching resources correctly, in line with the teaching subject and content

Teaching resources should take into account both online and offline resources, and be selected according to different teaching subjects and specific teaching content. Firstly, for different teaching subjects, including teachers and students, it is necessary to choose teaching resources that are suitable for their characteristics and needs. For teachers, they can choose high-quality online courses, teaching tools, and teaching management systems to help them better design and organize course content, and improve teaching efficiency. For students, it is necessary to provide diverse learning resources, such as online videos, interactive courseware, etc., to stimulate their interest and initiative in learning. Secondly, the selection of teaching resources should also match the specific teaching content. Different disciplines and knowledge points may require different forms of resource support. For example, for language related disciplines, one can choose some speech recognition software or online language learning platforms; For

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science disciplines, virtual laboratories and other resources can be utilized to assist practical learning. At the same time, suitable teaching resources can be selected based on different teaching objectives and learning tasks, such as online discussion platforms, programming simulation software, etc. Taking into account the characteristics of the teaching subject and teaching content, selecting teaching resources correctly can effectively improve teaching effectiveness, promote students' learning interest and deep participation. Reasonable allocation of various teaching resources in blended learning will help achieve personalized educational goals, improve student learning outcomes and satisfaction.

5.2. Pay attention to the design of teaching scenarios and enhance students' problem-solving abilities

One of the cornerstones for students to develop core competencies is problem-solving ability, which is also an essential skill for today's students. We need to cultivate students' problem-solving skills in classroom teaching by involving them in the context of knowledge generation and interacting with teachers and peers to enhance this ability. Situational learning focuses on creating real-life situations, in which teachers play the role of designers and organizers of student learning. By designing contextualized activities, they promote cooperation and communication among students, while providing learning support when necessary, and providing feedback and evaluation of their learning process. In the constructed blended learning model, based on students' cognitive level, close to real life, emphasis is placed on designing problem scenarios in offline teaching, stimulating students' thinking about tasks through a series of coherent questions, and using learning task sheets as auxiliary materials to guide students' course learning, ultimately helping them find solutions to problems. Therefore, in the teaching practice of teachers, placing students in real problem situations is the key to the blended learning model.

5.3. Strengthen the collection of teaching data and generate student learning profiles

In blended learning, it is crucial to strengthen the collection of teaching data and generate student learning profiles. By combining online and offline teaching environments, more comprehensive and diverse data can be obtained to help more accurately understand students' learning situations and needs. On online platforms, students' online behavior data can be collected, such as learning duration, clicks, homework completion status, etc., in order to understand their learning interests and learning efficiency. In offline classrooms, more intuitive information can be obtained by observing students' participation, interaction, and classroom performance. By integrating and analyzing these multi-source data, student learning profiles can be generated, including information on students' learning styles, learning preferences, knowledge mastery, and potential learning barriers. Based on students' learning profiles, teachers can better develop personalized teaching plans, provide targeted guidance and incentives for students' different needs and characteristics, thereby improving teaching effectiveness. In addition, the generation of student learning profiles can provide important data support for schools and education management departments, helping them better understand the overall situation and development trends of student groups, and providing scientific basis for teaching reform and policy formulation. Therefore, in blended learning, strengthening the collection of teaching data and generating student learning profiles will help promote the implementation of personalized education, improve teaching quality, and promote the overall development of students.

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References

[1] Song Dongling, Zhang Shenghai, Hou Deting, etc Exploration of Online Teaching Practice of College Physics Based on Multiple Platforms [J] Education and Teaching Forum, 2021 (20): 97-100

[2] Accelerating the construction of an educational powerhouse provides strong support for the great rejuvenation of the Chinese nation People's Daily, May 30, 2023

[3] Li Xiong, Wang Aixing, Wei Yongheng Online Teaching Practice Based on MOOC+Live Teaching - Taking University Physics Course as an Example [J] Chinese Journal of Multimedia and Online Teaching, 2021 (11): 182-185

[4] Zhang Daliang Write a new chapter of "Internet plus Education" and jointly create a bright future of Asian higher education [J] Chinese University Teaching, 2018 (10): 7-8

[5] Jin Yi, Wang Yizhi, Liu Junliang Research on Layered Teaching Mode Based on Blended Learning [J] Modern Educational Technology, 2013, 23 (01): 37-40+2

[6] Xiao Guangde, Huang Ronghuai Problems in the Implementation of High School Information Technology Curriculum and Considerations for the New Curriculum Standards [J] China Electronic Education, 2016, No. 359 (12): 10-15

[7] Ma Hailong Research on Effective Teaching of Information Technology in High School under the New Curriculum Standards [J] Data, 2023, No. 341 (01): 79-80

[8] Fan Limei, Wang Guoxiong Analysis of High School Information Technology Curriculum Reform from the Perspective of Informatization 2.0 [J] Tech Wind, 2022, No. 511 (35): 29-31

[9] Li Dan Research on the Current Situation and Innovation of High School Information Technology Curriculum Teaching Mode [D] Shaanxi Normal University, 2017

[10] He Kekang The New Development of Educational Technology Theory from the Perspective of Blending Learning [J] Information Technology Education in Primary and Secondary Schools, 2004 (04): 21-31

[11] Ding Yitao Exploration of Teaching Reform of Python Programming Language Based on Online and Offline [J] Tech Wind, 2021 (28): 114-116