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Online Open Course Blended Learning Instructional Design Research

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Abstract: In view of the existing teaching design problems such as inaccurate analysis of learning situation, insufficient flexibility of teaching presupposition, insufficient adaptability of situation design, insufficient interaction of activity design, and unreasonable evaluation design, this study is based on the blended learning teaching structure and process. A staged and hierarchical online and offline hybrid teaching design framework is constructed. The teaching design framework mainly includes four aspects: pre-class pre-set and learning situation diagnosis analysis design, in-class situation creation and interactive implementation teaching design, after-class expansion and migration teaching design, and diversified teaching evaluation design with equal emphasis on process and results, to "recognize the material", accurately design teaching, "teaching" efficiently, and evaluate objectively and comprehensively.

Keywords: blended learning; instructional design; activity design; evaluation design

1 Introduction

Blended learning of online open courses is favored by learners because it can give full play to the advantages of formal learning and informal learning, support a variety of learning scenarios, flexible and diverse teaching methods, and meet the needs of personalized learning and in-depth learning^[1]. It is changing the traditional teaching and learning form. However, in the

process of teaching implementation, there are dilemmas such as poor learning experience, low interaction, and high dropout rate, which are problems to be solved urgently at present^[2]. How to carry out online and offline integrated teaching design, improve the enthusiasm and participation of learners, and improve learning experience and learning efficiency, has always been the focus and difficulty of online open course teaching reform. Teaching design is a systematic decision-making activity for teaching objectives, teaching process, learning methods, teaching resources and environment, teaching evaluation, etc., and is a systematic conception of teaching activities^[3]. At the same time, teaching design is also the most microscopic and daily teaching research and teaching reform practice. Personalized and appropriate teaching design is the basis for carrying out teaching activities, it is the key to promoting students' in-depth learning, and it is also one of the effective ways to solve the current difficulties of poor learning experience and low learning efficiency in online open courses.

2 Problems existing in the current teaching design

Throughout the historical evolution of teaching design in the past 20 years of curriculum reform in my country^[4], teaching design has experienced the teaching design of subject knowledge based on "teaching"^[5], to the diversified teaching

design based on "learning" learning methods [6] [7] [8], and then to the teaching design to promote the development of students' subject core literacy [9] [10] [11] three development processes. After reviewing the literature, it is found that the existing teaching design still has the following shortcomings in the analysis and design of students' starting point learning situation, interactive design, evaluation design, etc.: First, the logical starting point of the teaching design is not accurate enough, and it is difficult to comprehensively evaluate the learning situation^[12]; It is because the teaching preset "one face for thousands of people" is not flexible enough to cover the needs of different learning groups^[13]; third, the design of teaching situations is not suitable enough, and it is difficult to mobilize the enthusiasm and participation of learners; fourth, the design of teaching activities is not interactive enough and difficult to promote Deep learning occurs; fifth, the evaluation design is unreasonable, and it is difficult to conduct a comprehensive scientific evaluation, thus restricting the improvement of teaching and learning^[14]. In-depth study of the reasons, the above problems are not only due to the shortcomings of the teaching designers themselves, but also because the application of intelligent technology in education and teaching is not deep enough, such as multi-modal data collection technology for learners, easy-to-use data diagnosis and Analysis model, personalized recommendation technology, etc.

3 Analysis of the teaching structure and process of blended learning in online open courses

Online open course blended learning has become an important way for people to learn knowledge, improve skills and lifelong learning for all. With the rapid development

and progress of infrastructure construction in our country, modern information technology and education have been continuously integrated and developed, and the traditional classroom teaching process has been recreated, realizing efficient interaction and real-time evaluation in the whole process of pre-class, in-class and after-class, and realizing students' individuality chemical learning and teachers' precise teaching^{[15] [16]}. On the whole, the teaching process of online open course blended learning mainly includes three stages: before class, during class and after class. At each stage, teachers and learners include a series of implementation links; at the same time, in the process of teaching and learning, A large amount of data related to the learning process and learning results also provides a data basis for teaching evaluation and feedback.

(1) Pre-class stage

Teaching presupposition: Teachers conduct preliminary teaching design based on the analysis of learning objectives, learning environment, and individual/group initial learning needs of learners. Pre-class guided learning: Teachers develop pre-class guided learning (online independent learning) materials, design a learning guide task list, and push them to learners. Pre-class evaluation: After completing each learning task according to the learning task list, conduct pre-class evaluation and record the existing problems. Learning situation analysis: Teachers conduct comprehensive research on students' learning situation based on information such as students' learning time, resource learning situation, forum comments, interaction situation, and evaluation of student guidance. Teaching redesign: According to individual differences, pre-class learning preview evaluation and other precise learning

situation analysis, the teaching is redesigned according to the classification and classification based on learning^[15].

(2) Mid-class stage

Situation creation and problem introduction: Teachers create appropriate learning situations according to the learning content, selected teaching mode and other factors, and introduce the learning tasks of this section in an appropriate way to inform students of the important and difficult points, learning objectives and related matters needing attention. Inquiry learning: This link is an important part of the middle stage of the class, and it is related to the level of learning effectiveness. After clarifying the learning tasks, students can explore independently or cooperate in groups to explore and solve problems to complete the learning tasks. Real-time evaluation: After completing the learning task, the learning effect evaluation will be carried out immediately. Summary and improvement: After displaying the learning results, the teacher summarizes and reflects on the completion of the learning task and the remaining questions^[15].

(3) After-school stage

After-school extension: According to the completion of learning tasks and the performance of the learning process, teachers design and expand advanced learning projects to improve students' application of knowledge and skills. Resource recommendation: Use data mining, learning analysis and other technologies to analyze students' learning process data and assessment data, diagnose their weak points and push appropriate personalized learning resources to students. Precise tutoring: Under the empowerment of intelligent technology, students' difficulties

are diagnosed and targeted tutoring is provided to improve their learning effectiveness. Reflective evaluation: teachers and learners reflect on the shortcomings in the teaching and learning process that need to be improved, so as to adjust the corresponding teaching strategies and learning strategies in time^[15].

4 Online Open Course Blended Instructional Design

Good instructional design is the key to the success of blended learning, which can effectively promote the occurrence of deep learning. Based on the teaching structure and process of blended learning, the teaching design of online open courses is carried out from three aspects: before class, during class and after class.

(1) Teaching design of pre-class presets and diagnostic analysis of learning situation

Before teaching design, we must first understand and grasp the physical, psychological and social differences and characteristics of learners, especially the learners' cognitive style and existing cognitive foundation. Figure 1 shows the teaching design framework of the pre-class instruction stage. At this stage, teachers can deeply mine these data by collecting students' learning behavior data, guidance assessment data, historical academic data, etc., and with the help of big data, learning analysis and other technologies Students' learning participation, knowledge mastery and other information, comprehensive analysis of students' learning situation. First, teachers use the lesson preparation system, online open course learning resource system, and classroom teaching content to complete the pre-class learning resource preset; complete the design of the tutorial task list and release the tutorial assessment to help students learn their learning styles and initial cognition. The foundation and level, the

completion of the study guide are measured; the teacher collects the students' learning process data, evaluation data and feedback results, conducts multi-dimensional class overall analysis and student individual analysis, and forms the initial learning situation analysis and diagnosis report; on this basis In the above, teachers combine "learner analysis + learning content analysis + blended learning environment analysis" to redesign teaching, which is also the focus and difficulty of teaching design in the pre-

class learning stage. In teaching redesign, the overall situation of students and the actual differences of individual students are fully considered, and flexible presuppositions are made. The flexible teaching preset can be designed according to the specific learning situation of the learners in the pre-class learning stage, including the design of teaching objectives, the design of teaching resources, and the preset of teaching strategies.

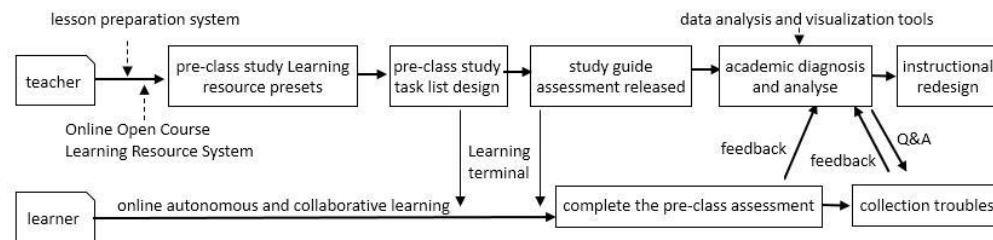


Fig. 1 instructional design framework for pre-class guidance stage

(2) Situation creation, interactive implementation of teaching design

Appropriate situation creation is based on the teaching objectives and teaching content requirements, based on students' differences in growth environment, life experience, cognitive level, etc., through physical objects, animations, audio and video, etc. The process by which students learn the required teaching situation. The teaching design framework of the research stage in the course is shown in Figure 2. 1) Situation creation and diverse introduction of learning tasks: On the basis of accurately understanding the overall learning situation of the class and the individual learning situation of students, teachers combine teaching objectives and teaching content, and use the various resources and interactive technologies provided by the intelligent

teaching platform to target different courses. Categories, specific teaching objectives, and the requirements of different teaching links, create diverse and appropriate teaching situations, and realize the hierarchical introduction of teaching content [17]. According to the purpose and content of situation creation, appropriate situation creation can include story situations, problem situations, real life situations, experimental situations, virtual reality situations, and cooperative exploration situations. 2) Content stratification, student grouping, and cooperative inquiry learning: On the basis of learning situation stratification and goal stratification, the teaching content is stratified and students are divided into groups. According to the degree of difficulty of the required learning content and the individual differences of students, according to the dimensions of interest,

learning ability, cognitive foundation, etc., according to different cooperative learning methods, students are reasonably grouped, so as to facilitate the communication and cooperation between teachers and students and students. Through project learning, game learning, group cooperation and exploration, etc., students' ability to explore and innovate can be improved [19]. 3) Diversified classroom interaction: Diversified classroom interaction is the realization of teachers and students around the teaching goals, and the main participants in classroom teaching are mobilized through diversified interactive forms and contents, forming a dynamic development of benign interaction between them. Process [17] according to the learning content, the overall learning situation of the class and the individual learning situation of students, teachers design classroom interaction forms, processes and resources required for students to achieve teaching goals; design interaction forms for different interactive subjects. At the same time, teachers organize students to carry out diversified classroom interactions, and combine the process data analysis of classroom interaction to timely and accurately understand the differences in

students' knowledge mastery, group collaboration, and classroom participation; according to the interaction of different students, timely participation and consolidation Or compensatory measures to enhance the depth and relevance of the interaction. 4) Real-time assessment and instant feedback: Real-time assessment and feedback is a process in which teachers organize and carry out various forms of real-time assessment in the classroom, diagnose students' knowledge and skill levels, and intervene and adjust follow-up teaching activities based on the feedback data generated in real time. Diversified evaluation feedback can be designed as online real-time evaluation feedback or a combination of offline and online, and can also be designed to upload and receive evaluation feedback results from various mobile terminals. According to the classroom evaluation analysis report, teachers can accurately and efficiently adjust the pre-teaching design, intervene in the learning process of students, and improve the pertinence and effectiveness of teaching; Confusion and conclusion.

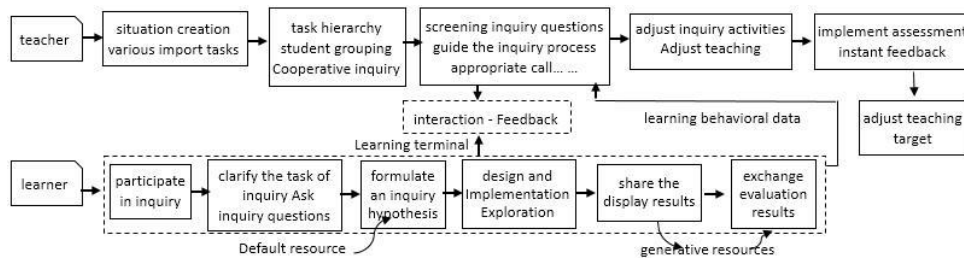


Fig. 2 the teaching design framework of the research stage in the course

(3) After-class expansion and advanced teaching design

According to the data such as classroom evaluation analysis report and learning behavior analysis report of students in the

research stage during the course, teachers design the after-class expansion learning tasks or advanced improvement tasks in layers and categories. Figure 3 shows the teaching design framework of the after-

school extension stage. First, teachers analyze students' classroom interaction and other learning behaviors, learning emotions, and classroom test results through the information-based intelligent platform to understand the differences in students' classroom learning mastery, learning habits, attitudes, etc. Various types of extended learning tasks and extended learning assessment papers have been developed, and appropriate extended learning resources have been developed and distributed to students through an intelligent platform. Then, students independently or collaboratively complete the extended learning tasks and complete the after-school extension assessment. The teacher re-diagnoses and analyzes the overall learning

situation of the class and students' individual learning conditions based on the results of the extension assessment and student behavior. One round of instructional design provides precise learning analysis. Finally, according to the learning diagnosis and analysis report, teachers record micro-lectures explaining difficult problems according to the difficult problems that arise in extended learning after class, or record the same type of students' homework into micro-lectures and push them to the students who need them^[13]. Provide offline or online targeted tutoring for individual students with learning difficulties, so that each student can meet the learning goals and develop in an all-round way.

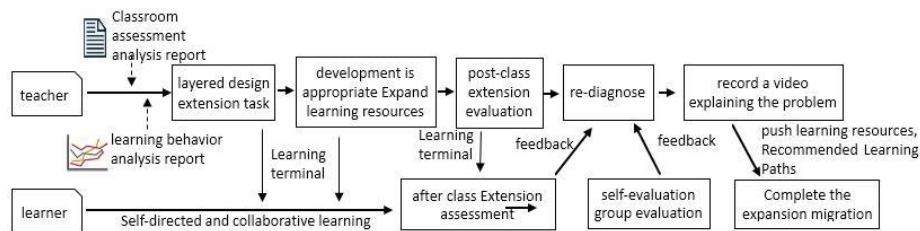


Fig. 3 the framework of teaching design in the after-school extension stage

(4) Diversified evaluation design with equal emphasis on process evaluation and result evaluation

The ultimate goal of evaluation is to diagnose and improve teaching and learning. In order to pay more attention to the students' process and improve the teaching effect, this paper constructs a diversified evaluation design system that pays equal attention to both process evaluation and result evaluation. 1) Based on the online MOOC learning platform, the IoT perception of offline smart classrooms and other equipment, the "whole process, all-round" accompanying collection of students'

learning process data and learning result data before, during and after class, including Learning history data, pre-class evaluation data, in-class real-time evaluation and interactive data, after-class extension evaluation data, learning emotion data and feedback data, etc. 2) Use learning analysis, data mining, digital portrait and other technologies to analyze data in multiple dimensions to evaluate and diagnose learning effectiveness; embed evaluation into teaching design, integrate evaluation into the whole process of pre-class, in-class, and after-class, from process evaluation to results Comprehensive evaluation of

students in terms of sexuality evaluation and value-added evaluation. 3) Cross-coupling value-added evaluation with process evaluation and result evaluation, pay attention to the starting point of students' learning, and pay attention to the learning process. performance, carry out longitudinal comparison, guide students to focus on their own comprehensive performance^[19], improve the result evaluation and strengthen the process evaluation through the implementation of value-added evaluation, and promote the all-round development of students^[20].

5 Conclusions

This research relies on modern information technology to empower online and offline mixed teaching design of online open courses; through accurate "recognition of materials", it helps teachers to accurately design teaching and effectively "teaching", in order to improve the teaching interaction of online open courses Problems such as low sexuality, poor learning experience, and low

learning effectiveness provide new solutions. This research proposes a teaching design framework for blended learning of online open courses. The framework conducts hierarchical and classified teaching design from three stages: pre-class learning, in-class research, and after-class extension. The learning evaluation design is embedded in the whole teaching process, so that teachers can accurately provides practical reference for "recognizing talents", accurately "teaching" and scientific evaluation, improving teaching quality and promoting students' all-round development.

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