

Research and Exploration on the Design and Development of Online Courses

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Abstract: With the continuous development of social environment and technological means, the form of education has also. Online education is gaining ground, it gradually changes schools, classes, teachers and students from many aspects such as teaching concept, methods and resources and it has a profound impact on the bottom thinking and working mode of curriculum construction. But the current online education model has big limitations. Online education is not simply a "classroom move," nor is it just a resource for courses or a new form of classroom instruction. The design and development of online courses need to be reviewed from a new perspective. This paper mainly puts forward some views on the design and development of online courses, and studies and carries on the research and the exploration from the design and the development scope, the characteristic and the procedure and so on.

1. Introduction

The driving force of reform often comes from the change of social environment, individual demand and technological force. In the process of the current Internet and education revolution, focusing on individuals and emphasizing the application of technological power occupies a dominant position. It is making online courses the most important carrier for the reform of learning concepts, learning modes, learning contents and learning methods.

The advantages of online courses over traditional offline courses are not limited to the technical aspects. Instead, it gradually changes schools, classes, teachers and students through teaching concepts, methods, resources and other aspects, aiming at reforming the underlying thinking and working mode of curriculum construction. But online courses are not being developed to replace offline learning. To move all the offline courses to the online, it can trigger more profound thinking on both sides of the teaching and learning, jointly build a good education ecology. The design of offline traditional courses is usually based on the needs of students, the class (or other organizational form) the level of the median staff, and the ability of the educator to make appropriate splits or integration. The design of offline traditional courses is generally concerned with mastering knowledge. Teachers select learning contents and teaching materials according to the existing teaching standards and experience and arrange the course structure. The total amount of teaching information materials need to be collected and made is relatively small.

If we just look at the online course reform from the perspective of "classroom move", we only need to post produce or record the course process of teachers and students by open course, and publish the corresponding course resources to the Internet for sharing. From the perspective of curriculum reform, online course is not just a course resource or a new form of classroom teaching. This process of "course moving" is a process of reshaping goals and reconstructing contents [1]. It is also a process of making students actively participate. With the cooperation of teachers and technicians, new teaching situations should be created based on the online. Through watching, practicing, discussing, answering questions, doing homework and testing, students can have a better learning experience. Under the condition of truly mastering knowledge and ability, I will devote my offline time to more meaningful learning and practice activities. It has realized the "curriculum move" and built a new education ecology, which will bring us future-oriented learning

and education.

2. The influencing Factors of Online Course Design and Development

2.1. Model of Learning

In the context created by the curriculum, students' simplified learning model consists of two parts: environment and memory. Environment includes the knowledge carriers that can be seen, heard, heard and touchable, as well as the resulting subjective thoughts, such as learning videos, test questions, experimental environments, words in books, operating equipment, thinking and feeling, etc. Through the sensory organs, the environment sends information to the brain through a variety of channels (vision, hearing, smell, touch, feeling, etc.) to form memories.

2.1.1. Memory

The completion of the course represents the exchange of knowledge, and what is formed is memory, divided into two types: working memory and long-term memory. Working memory holds the information you are thinking about and processing, which belongs to the continuous tense. Long-term memory stores factual knowledge, conceptual knowledge, procedural knowledge and meta cognitive knowledge that have been internalized by the student subject, which belongs to the perfect tense. Working memory is not stable and decays rapidly. For example, I feel that the contents of sudden recitation have a good memory effect, but it is difficult to recall them in the examination the next day. Long-term memory is often associated with a long decay period and may be continuously strengthened in the process of application. The process of learning and forming memory can be regarded as either an input-process-output process or a short-term storage-long-term storage process of transforming information storage forms. The effectiveness is generally reflected in the combination of learning and doing. Whether considering the effect of "processing" or "storage", the quality of the course itself is the key factor to determine the quality of learning and memory.

2.1.2. Influence Formula

Some scholars have put forward a formula about the effect of information reception and memory from the perspective of psychological influence: Information reception and memory effect : text effect and sound effect and performance effect. Text effect, sound effect and environment effect accounted for 7%, 38% and 55% respectively. When applied to the individual learning process of students, the influence of textbooks and other learning texts in the offline teaching process of traditional courses is 7%, 38% of teachers' explanation, 55% of teachers' body language, homework, communication and discussion, and context construction.

Although the influence of the three effects is placed in different channels, it is difficult to produce superposition due to the limitation of individual teachers' level and state. Online courses take learning video as the basic carrier, making text, sound, environment learning materials more rich, it can promote the integration with a wider range of learning interaction, focusing on improving memory effect, information exchange efficiency, especially the quality of application. It will be an important starting point for the design and development of online courses.

2.2. Applied Theory of Learning

2.2.1 Constructive Learning Theory

Constructive learning theory is adapted to human cognitive model, it is believed that what students first leave behind in the learning process is the visual understanding of knowledge, and then they can accept the new knowledge and find the balance point among it. Through the interaction with the external environment, it constantly promotes the development of its own cognitive structure, and the construction process is also the process of establishing knowledge connection, acquiring and constructing a new knowledge system. Applying constructive learning theory to the learning process of online courses, it can be found that the main role of students is more obvious. Design and development work needs to combine cognition and emotion, create a

learning platform and environment for mutual discussion, and realize communication from multiple directions. Pay attention to stimulate learning interest and learning potential, so that students rely on their own and the interaction of rich resources in the external environment to achieve independent learning. Students are encouraged to choose courses and learning resources and arrange teaching plans according to their own reality, so as to transform the implementation of learning activities into a process of self-initiation, self-participation and self-evaluation.

2.2.2 Cognitive Load Theory

According to cognitive load theory, the processing ability of working memory is limited, which affects students' ability to process, encode and retrieve information. Cognitive load can be divided into extrinsic cognitive load, internal cognitive load and associated cognitive load. Extrinsic cognitive load is the load caused by students' processing of materials unrelated to their learning objectives. Internal cognitive load refers to the load caused by learning materials containing a large number of elements that must be processed simultaneously. Connected cognitive load refers to the load generated when students use their working memory to solve problems that cause internal cognitive load. Good instructional design can reduce external cognitive load by avoiding activities unrelated to learning needs. Control the interaction of information elements to manage the internal cognitive load, complete the construction of knowledge and constantly increase the associated load. For example, reduce the learning content irrelevant to the target, adjust the order of teaching content according to the degree of difficulty and apply multimedia technology to unify the presentation style of the course to avoid taking up multiple channels for a long time to transmit information.

3. The Design and Development of Online Course

3.1. The Design of the Online Course

"Design" is the process of conveying project needs and thinking through planning, planning and other forms. For online courses, it is to take rational thinking as the leading role and apply the construction learning theory to re-match the learning needs, It can formulate the learning objectives, content and organizational structure of the course, and plan the overall learning path.

3.1.1. Scope of Design

Analyze students' learning characteristics and existing learning basis. Expectation of learning content and application scenarios; Plan your learning model and focus. Contrast and analyze the gap between learning needs and current situation. Combining with the construction results of offline traditional courses, the learning objectives of design knowledge and cognition dimension are optimized. Build a framework of learning system, and make clear the learning progress, learning content, learning requirements, time allocation and other factors. In order to better link up the follow-up course development work, we can put forward the supporting learning conditions to support the learning process and preset the learning quality evaluation method. Formulate quantitative evaluation indicators for the overall course content or each course module, and relevant work can be completed jointly by teachers and design and development technicians.

3.1.2. The Design Characteristics of Online Courses

Compared with the offline traditional courses, the design of online courses is more targeted and applied. For example, the communication topic for college students' employment courses, the offline traditional courses generally aim at getting familiar with the communication principles, systematically mastering the knowledge of communication, and designing teaching contents such as the importance, principles and elements of communication, common communication methods and skills, and typical cases of communication. The design idea of this form is similar to that of writing textbooks, which is mainly taught on the whole, and the written test will be chosen to test the mastery of the content. For the same topic, the online course aims to be able to communicate with different people and situations. Choose the right way to achieve the purpose of communication. In this paper, we designed different communication scenarios of internal and external modes and of

upper and lower modes.

This form of design will focus on building context with video instruction. Promote students' memory in the situation and form knowledge transfer. In the process of interactive learning, it may give students a more intuitive impression and create a better learning experience. Finally, you can choose the degree of mastery of the simulated exercise test content.

3.2. Online Course Development

"Development" is the project needs and design requirements through a certain process, method, means, testing to achieve the process. The process of online course development is the process of the implementation of course design ideas, whose core lies in the presentation of course content and technical support. The cognitive load theory and multimedia learning theory are used to analyze the learning objectives and contents. Reasonably coordinate the overall presentation style of the course. Develop supporting learning resources. Arrange the time and work steps in the course development process with engineering project thinking.

3.2.1. Scope of Development

Develop learning resources and match them with learning content. Unify the presentation style of courses, and arrange courses introduction and learning tasks of similar specifications for each class. Explain the use of learning resources. Prepare text scripts and make scripts. Supporting presentation, video, electronic textbooks, experiments and other learning resources. In the process of promoting the course making task. The quality evaluation index system suitable for the course can be developed according to the actual situation. It evaluates whether the learning objectives are achieved and the learning contents are completed, and inspects the overall development quality of the course.

3.2.2. The Development Characteristics of Online Courses

Compared with offline traditional courses, the development of online courses is more open and interactive. For example, a lecture course on safety knowledge for primary and middle school students. The objective and content of offline traditional courses is to master safety knowledge and typical cases of violation of safety requirements. Power points and case videos have been developed for different areas such as transportation, food hygiene and infectious diseases. This form of development process is primarily about gathering material. Through continuous explanation or playing videos to promote the formation of students' cognition, but it is difficult to establish a connection with the actual situation in social practice. For the same lecture course, the online course focuses on matching and optimizing the target, content and students' basic learning ability and learning characteristics. In the development process, video resources that are not easy to arouse resonance were deleted and a large number of communication and interaction links were added. On the basis of establishing the basic concept of safety, the students are guided to share the security incidents they have experienced and independently search for case materials to support their views, so as to arouse reflection. The new development process encourages students to jointly construct new learning situations and improve their learning ability through network information resources [2].

3.3. The Core Idea

3.3.1. The Important Transformation of Online Course Construction Thinking

The design and development of online courses follow the basic teaching rules. Online more fully embodies the teaching attributes, It conforms to the cognitive law of the learning subject, the learning law of subject knowledge and the processing law of complex problems. Compare traditional courses offline, the design of curriculum objectives reflects the commonness and individuality. By providing different learning resources to meet the needs of different types of students. Multivariate carriers are used to create teaching situations in the learning process. To arrange the process from the perspective of students, guide active thinking, participation and

communication, and stimulate interest or motivation in learning [3].

Increase the flexibility of teaching content presentation, teaching methods, learning process arrangement, communication and interaction, and teaching evaluation methods. To enable students to recognize the control ability of the course, and combine their own characteristics and needs to effectively integrate into the course to implement active learning. Teachers play more of a guiding role in the teaching process. The smooth implementation of teaching activities can be ensured by understanding students' practical problems, designing target content, developing teaching resources and supporting intervention measures in the early stage [4].

3.3.2. Key Elements of Online Course Construction

Fully consider the diversity and difference of students' learning characteristics and cultural background. Create a learning situation through design and development work. Present each learning link around the objective orientation and content. Downplay the complexity of the process and external form. Through text, pictures, videos and other diversified learning resources, students are encouraged to focus on problems and solve problems.

Through online courses, the cooperative learning relationship between teachers and students is established to build a "learning community" to give play to the advantages of collective learning and form an open, inclusive and developing learning atmosphere. In the course of curriculum design and development, we should establish a cooperative relationship between teachers and technical personnel, learn from each other's strong points and constantly absorb and apply advanced teaching ideas and technical tools, so as to jointly build high-quality courses.

3.4. The Five-step Method of Building Lessons

On the basis of inheriting the good experience and practices of offline traditional courses, the design and development of online courses can be summarized into five key links: needs analysis, target positioning, content design, development presentation, curriculum production [5]. Among them, demand is the core, and all design and development work is based on the needs of students, and teachers' needs and experience will play a guiding role [6]. The goal is the node, which not only describes the path to meet the needs, but also provides the main line that can be followed for the design of learning content. The contents are details, which describe the specifications and performance standards of knowledge points and form the overall structure of the course [7]. Development presentation is the overall planning, providing an overall plan for the application of various types of learning resources to solve students' practical problems; The production of learning needs to meet and verify, the design and development of all the assumptions into reality.

3.4.1. Demand Analysis

It analyzes students' learning characteristics, existing learning basis, expectations for learning content, and application scenarios, and preliminarily plans learning modes, learning objectives to be achieved, learning content focus and supporting resource forms [8].

3.4.2. Target Positioning

By comparing and analyzing the gap between learning needs and the current situation, and combining with the reality of offline traditional courses, learning objectives of knowledge and cognition dimension are optimized [9]. The node processing is carried out along the main line of demand, and a reasonable path is designed and planned. On the basis of the multidisciplinary knowledge system, the node is effectively connected, expanded, realized and strengthened.

3.4.3. Content Design

Build a framework of learning system, and make clear the learning progress, learning content, learning requirements, time allocation and other factors. Filter, split and integrate all the knowledge that meets the needs to build a reasonable framework structure for the course [10].

3.4.4. Development Presentation

Match learning content and learning resources, unify the presentation style of learning videos, develop overall presentation style, content resources and learning methods, and optimize text scripts and presentations.

3.4.5. Curriculum Production

The application of information technology, multimedia technology to produce and accurately present quality curriculum resources. Follow the production script and use appropriate production technology to form learning resources such as learning videos and new form textbooks. The new round of online course construction and reform, compared with the two-way interaction between teachers and students in offline classroom, it has become an interactive learning ecology of teacher-technology environment-students, and the dissemination and diffusion of knowledge, learning experience and learning quality have been greatly improved. However, curriculum-centered education is not only about learning, but also includes context construction, value shaping, skill generation, character cultivation, etc. These practical contents often need to be completed by offline face-to-face teaching. The construction of online courses is still unsatisfactory and requires more practice and thinking.

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