

Design and development of interactive micro-course

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Abstract: Interactive micro course is based on the knowledge of the subject, through the corresponding learning activities to learn, to form an open, situational curriculum resources, at the same time can be interactive teaching application environment. In addition to its advantages of “short and concise”, the most important thing is that it has interactivity, which can stimulate learning motivation and promote knowledge transfer. With the development of information technology, more and more teachers pay more attention to the design of interactive elements, the pursuit of interactive teaching, but China’s interactive micro lesson is still in the initial stage of development, so it is very necessary to strengthen the exploration of interactive micro lesson.

This research advances the research on the theoretical value and application value of interactive micro lessons by clarifying the design and development of interactive micro lessons by the use of the Articulate Storyline. By demonstrating the development of interactive courses for the Articulate Storyline, the use of the Articulate Storyline can be improved, more scholars and teachers can learn and master the software, promote the development and application of interactive courses, and ultimately contribute to the improvement of the quality of education and teaching.

Key words: Interactive micro course; Articulate Storyline; The development of interactive micro-lessons

I. Research background

In the era of Internet +, innovative talents are more in line with the needs of The Times, especially in the fierce international competition environment, only innovative talents can take the initiative. Micro-courses, with their characteristics of “short, small, precise and fierce”, meet the needs of students’ personalized learning, and become one of the most concerned forms in today’s teaching activities. At present, most micro-courses are mainly unicast, which lacks communication with teaching content and feedback of learning effect, so it is difficult to develop students’ creative ability. Over time, ordinary micro-courses cannot arouse students’ interest and cultivate truly innovative talents. Based on this, it is necessary for current education to design and develop interactive micro-lessons to introduce them into teaching and solve the outstanding shortcomings of ordinary micro-lessons.

II. The significance of research

In terms of theoretical value, the interactive micro course produced by the Articulate Storyline breaks many drawbacks of common micro course teaching, provides more choices of teaching forms for modern information teaching, makes full use of information technology to effectively promote the occurrence of teaching process, and contributes to the development of interactive micro course and its application theory. In terms of application value, it optimizes the teaching methods and learning methods, makes students more involved, makes up for the shortcomings of the common micro-course interaction, and improves the teaching quality and efficiency. At the same time, it promotes the development of interactive micro courses for the Articulate Storyline, improves the use efficiency of the Articulate Storyline, promotes the development and application of interactive micro courses, and is ultimately committed to the improvement of the quality of education and teaching.

III. The theoretical basis of interactive micro course design

1. Cognitive load theory

First proposed by cognitive psychologist John Swiller, cognitive load theory mainly refers to learning to process and understand materials through working memory, and to encode acquired information into long-term memory. It mainly includes three types: endogenous cognitive load, exogenous cognitive load and associative cognitive load. When learning occurs, the three kinds of cognitive load occur simultaneously. However, because learners’ cognitive capacity is limited, both endogenous and exogenous cognitive loads must be well controlled so that learners can have sufficient capacity to integrate learning resources. In the design process of interactive micro lessons, learners’ cognitive level should be comprehensively considered, to avoid not only excessive endogenous cognitive load caused by providing too many learning resources, but also excessive external cognitive load caused by superfluous operations unrelated to learning goals.

2. Interactive learning theory

The theory of interactive learning is the theoretical basis of the whole process of modern teaching. In the teaching process, teachers cultivate learners’ subjectivity and subjective initiative by adjusting the interactive form with learners. According to the view of interactive learning theory, simply emphasizing the imparting of knowledge can not guarantee the smooth progress of learning, only the active participation of students can successfully complete the learning goal. Therefore, in the design process of interactive micro lessons, more attention should be paid to the interaction between learners and learning content. By strengthening the interaction design in micro lessons, students can avoid feeling tired of learning and promote their learning interest.

3. The “tower of experience” theory

Edgar Dale’s “tower of experience” theory was proposed in the 1940s, but it is still very relevant today. He divided the tower of

experience into three layers: experience of doing, experience of observing, and abstract experience. The tower of experience evolves from concrete to abstract, in accordance with the learning law of learners. The observed experience in the middle layer of the tower of experience is more concrete and easier for students to understand than the upper and lower layers, so as to make up for the deficiency of students' direct experience. In the design process of interactive micro lessons, we should gradually transition from concrete experience to abstract experience, focusing on observation experience, and promoting effective learning through pictures, recordings, slides and other forms.

IV. An overview of the Articulate storyline

Articulate storyline (AS for short) is an E-learning multimedia courseware making tool developed by the company in 2012. It is available in three versions. For this research, the version of Articulate Storyline 3 is mainly used. It integrates the functions of courseware production, screen recording, post-editing, testing, and feedback to facilitate the visual presentation of the teaching content. AS has rich image resources, its own character library role resources are not only rich, but also a variety of expressions, actions to choose from; Secondly, AS is easy to learn, easy to use and efficient. Users do not need to program, they can quickly and efficiently make high-level interactive micro lessons, easy to learn, easy to use and easy to use; In addition, AS has powerful interactive functions, the most typical such as setting triggers to achieve input interaction, button interaction, slider interaction and other interactive functions; Then AS has a wealth of test types to meet various teaching needs; Finally, AS can achieve flexible courseware release. The courseware can be released as a web page, Articulate online, LMS, CD and Word in five forms. It also supports the quality and release format of customized courseware. The courseware released by Articulate storyline3 is supported by Android and iOS platforms. Articulate Mobile Player is used by students to learn the language on the mobile end.

The material integration function of the AS supports the import of PPT and other texts or files. It is used to insert audio, video, pictures, and Flash files in various formats and set different animation effects for the files. AS interactive functions, including buttons, marks, interactive sliders, status, etc., can be set through triggers to achieve different states and functions. The user can edit the status of the interactive function of the current page in the "status" setting under the slide; AS video recording function, video recording can record the computer screen, or insert the already recorded video. Audio recording is the ability to add explanatory audio to each slide; AS's test question function is also interactive, such as drag and drop, single choice, multiple choice and so on. Users can also customize the questions according to demand, or randomly extract questions from the question bank; AS release function, support a variety of release formats, such as HTLM5, Flash, AMP, etc., and released files can support PC, mobile devices and a variety of online learning platform access.

V. Design principles and development framework of interactive micro-course

The basic design principles of interactive micro course mainly include: clarity principle, autonomy principle, timely feedback principle and interactive principle. This research and Development framework uses the most common model -- ADDIE model, which includes five links: Analysis, Design, development, Implementation and Evaluation. Each link restricts and influences each other. According to the content and characteristics of this study, an interactive micro-course development framework based on ADDIE model is established, as shown in Figure 1.

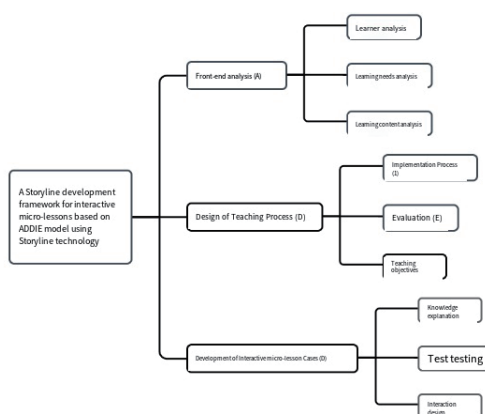


Figure 1. Interactive micro-lesson development framework based on ADDIE model with Storyline technology

VI. Development Cases of interactive micro-lessons

The development of interactive micro-course case This part mainly introduces the detailed development process of C language cyclic theme knowledge module interactive micro-course as an example, mainly including knowledge explanation, test test, interactive design introduction.

1. Knowledge explanation

This lesson focuses on the knowledge of three kinds of loop control statements and loop nesting in C language. Students learn in the form of self-directed learning, using interactive micro lessons developed by the Articulate Storyline. As shown in Figure 4, examples of three kinds of loop control statements are introduced by character embedding, speech explanation, graphical presentation, and example demonstration. As shown in FIG. 5, the example of circular nested knowledge explanation by using character embedding, voice explanation, and example demonstration.

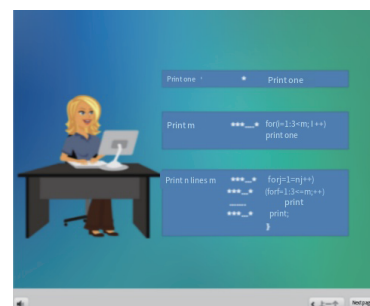


FIG. 2 Example diagram of knowledge explanation of loop control statement Figure 3 Example diagram of loop nested knowledge explanation

2. Test question detection

After learning knowledge, it is necessary to give timely feedback on the learning results of students, which is conducive to the consolidation and correction of knowledge. The feature for generating tests is included in the Articulate Storyline. The tests can set answers, feedback on answers, and score values. At the end of the test, the student's score and pass the test are reported, as shown in Figure 6, showing how to set the questions and the end result.

3. Interaction design

Interaction design is mainly divided into two aspects, namely feedback and branch jump. Feedback design is mainly reflected in the design of buttons in the whole micro-lesson and the feedback given by students after submitting the answers to the test questions. As shown in Figure 7, the interactive micro-lesson in this study shows the button setting, answer feedback and branch jump.

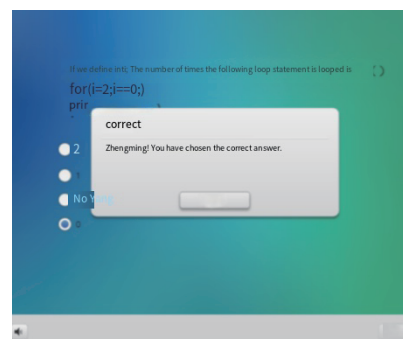
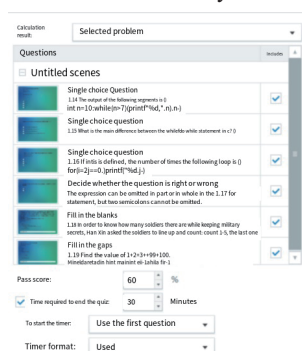


Figure 4. Test question setup diagram and effect diagram Figure 5 Shows the interactive design diagram

VII. Summary and Outlook

With the continuous development of information technology to promote the reform of education, various forms of teaching emerge in an endless stream and continue to develop, effectively promote the reform and progress of teaching forms, this study through the analysis and summary of domestic and foreign research status, based on the cognitive load theory, tower of experience theory, interactive learning theory as the guidance. To make use of the convenient, rich and versatile advantage of the Articulate storyline to create an interactive micro lesson featuring three kinds of loop statements and loop nesting in C language as an example, to show the features of the interactive micro lesson and its development course. However, the research in the field of interactive micro course is not perfect and mature, and it needs to be continuously developed and improved by scholars and researchers. This study is only a small part of the related research of interactive micro course, and its comprehensive development and progress require the joint efforts of more researchers.

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