Computer Immunology Testing CAI Teaching Software Production and Application

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Abstract. Immunology is a subject both old and young. It is the most preferred subject of the Nobel Prize in Physiology and Medicine, which shows that it has a lot of interesting basic research problems, but more importantly, immunology is closely related to health. Every specific scientific research mechanism problem can almost be directly related to clinical or industrial application, which shows the position of immunology in medical research. Computer aided instruction is common in the current course teaching, and it is not the least in the immunology examination. Based on these two situations, this paper discusses the making and application of CAI teaching software for immunology examination.

Keywords: Immunology Testing, CAI, Teaching Software, Production and Application

1. Introduction

In essence, CAI courseware is a kind of computer application software. Its development process and method have many similarities with the general software engineering, and it has many commonalities in the development of general multimedia projects. But because CAI courseware is a kind of teaching software, its purpose is to enable learners to complete the effective learning of the teaching content through the operation of courseware [1,2]. Therefore, it is different from other types of multimedia application software in content selection, structure organization, control strategy, interactive characteristics and many other factors, so its development and implementation methods have some uniqueness. With the help of CAI, immunology teachers can save a lot of time to make the class arrangement more reasonable and efficient, and the interaction with students is higher, and help students to learn immunology test.

2. Fundamental principles of immunological testing CAI software design

2.1. Based on the syllabus
Curriculum is the basic basis for teachers to carry out teaching, making CAI courseware, we must carefully study the teaching content, knowledge depth, emphasis, difficulties and teaching objects required in the syllabus [3]. In this way, we can make full use of the advantages of interactivity, repeatability, intuition and image of multimedia. It is necessary to clarify the conceptual principles, highlight the key points, break through the difficulties, arouse students' active learning, stimulate creative thinking, master new knowledge, grasp the internal relationship between knowledge points, and improve the teaching quality and teaching effect.

2.2. Grasp the teaching nature of CAI software

Developing CAI software needs to be based on advanced educational theory and educational thought, based on scientific and reasonable teaching strategies, and according to the teaching purpose, content and characteristics of students, choose appropriate teaching mode and carry out reasonable teaching design. During CAI software script design, consider whether the software is teaching aid or student aid? Is the purpose of demonstrating or creating situations? Practice consolidation or discovery? Besides, how to use CAI software to solve teaching problems should be considered. The content of the software should not only be based on the textbook, but also be bound by the content of the textbook. We should highlight the key points and refine and sublimate the teaching content. The content of the textbook is organized organically through careful design and presented in the form of multimedia, which can effectively arouse students' various senses, such as vision, listening and speaking, and form a reasonable teaching process system. It should not only fully reflect teachers' teaching style, but also reflect teachers' creative spirit, leading position and students' main position. It is beneficial to cultivate students' imagination, abstract thinking ability, innovative spirit and students' personality development. And make the CAI software conform to the basic law of teaching, which is convenient for classroom teaching

2.3. Grasp the science of CAI software

CAI software design and production should conform to the laws of pedagogy, psychology, cognition and aesthetics. CAI the content of the software should be accurate, scientific, reliable, all kinds of media should be appropriate, especially animation production should be true, appropriate and reasonable, as accurate as possible to express the teaching content, not only image, vivid, but also not excessive exaggeration and speculation [4-6]. In the organizational structure, we should not only embody the complete knowledge system, but also accord with the logical relationship of the teaching content. The level of knowledge should be deepened one by one, accord with the teaching procedure, accord with the law of students' knowledge, and step by step.

3. Development requirements of CAI software for medical immunology

3.1. Art serves teaching

CAI software as an auxiliary teaching means and supplement, the overall should be concise, focused, to avoid too much information accumulation. For the difficulties, we should provide a more detailed explanation, use the expression of various media, visualize the complex concepts, deepen the students' understanding, and stimulate the students' interest in further exploring knowledge. For example, in the chapter of type I hypersensitivity reaction, the reaction mechanism is both important and difficult. We first use arrow schema to show the reaction mechanism succinctly and give students a holistic
understanding. Then use the animation form to show in detail the sensitization stage, the sensitization stage, change the abstract content into image, vivid and concrete, so that the students can further understand thoroughly, and finally summarize several key points in the form of striking words to deepen the students' memory in order to achieve good teaching results. In the software with novelty content, beautiful background, rich font and color, friendly interactive interface to attract students to improve their interest in learning; through the use of enlightening form of questioning to mobilize students' subjective initiative. For example, in the first class of type I hypersensitivity, the image is used to show the penicillin allergic reaction and the allergic gastroenteritis caused by fish and shrimp in the students' daily life, so as to create the teaching situation. Through the establishment of hypermedia/hypertext links to provide a variety of teaching information, to meet the information requirements of different learners, but also to facilitate students to learn or review the relevant knowledge, to deepen the learning impression.

3.2. Strive for friendly interface, functional modules reasonable and complete

At present, the software is compiled Authorware a powerful and popular multimedia description tool, which pays attention to the good interface design and the interactivity of the software, so that the flow direction of the software can be scheduled at will according to the teaching needs. All kinds of information (text, graphics, images, animation and sound) that appear on the screen are not only in line with the teaching requirements, but also highlight the layout of the system, put the teaching content in the most prominent position of the screen, put the operation help information in the secondary part of the screen, and properly identify the content being learned [7]. Clear navigation, clear help information, simple and clear menu, icon image, any knowledge points between the jump flexible and convenient. The use of color should pay attention to psychological factors, the use of harmonious and pleasant color. Background pictures should be based on elegant color, text with dark tone, to highlight the content, attract students' attention, font, font size, word spacing, line spacing appropriate, subtitle display according to different content line by line or scroll up, etc. Image size, color collocation, picture group connection is reasonable. Animation production real image, animation play for real-time control. The recording of commentary is recorded with sampling frequency 22.05 Hz, quantization accuracy 16 bits, stereo, PCM format, so that the audio quality can meet the auditory effect well. The background music uses relaxed and gentle music, which not only sets off the atmosphere, but also does not distract the students' attention [8]. Set the sound play or pause button to play commentary or background music according to specific circumstances.

4. Development of immunological testing CAI teaching software

Summarize and analyze the contents needed in immunological testing software to provide clear navigation direction. Then the content into the corresponding material, easy to edit in the software synthesis. Enter the basic text in the immunological test with Word. Get pictures from the world medical library, use picture processing software in the computer Photoshop cut and text processing instructions, re-form some pictures. In addition, we also make some pictures related to the main content and uniform style, which can be used in the background diagram and navigation icon of software synthesis. Use animation to express abstract principles in immunological tests, such as enzyme-free reactions. FLASH software is mainly used to complete this, and some third party vector animation software is used to add the effect properly to make the animation more vivid. The software adds a proper amount of background
music to set off the atmosphere. Use Super Power to compress music into Mp3 files, and then use COOL EDLT to handle it slightly to match the environment of animation and other content. Finally, the author uses AUTHORWARE software to synthesize the above materials CAI software.

5. **Bear fruit**

Finished software can operate in a system environment above Win98. Can interact between pages. The software contains five sections, as shown in Figure 1 below [9]:

![Figure 1. Five major plates of manufactured software](image)

The finished product has a certain interactivity, so that teachers and students can operate on their own, select relevant content, animation and pictures to watch. After the completion of the production, the software was demonstrated to some professional teachers and students of the inspection department. It is generally believed that the software is effective in teaching and can concretize some abstract things through multimedia, so that the difficult things become easy to understand. For example, the reaction process described by the principle of enzyme-free reaction is invisible to the naked eye and can only be grasped from the introduction of words [10,11]. In the past, students felt it difficult to understand intuitively and learn. Through animation production and expression, students think the principle becomes clear and easy to master. At the same time, 316 questionnaires were sent out, all of which were recovered, and the statistical results were shown in Table 1.

**Table 1. Statistical examples of laboratory inspection CAI teaching software for infectious diseases (%)**

| Item       | n  | To feel quite pleased | Pleased     | Unsatisfy |
|------------|----|-----------------------|-------------|-----------|
| Help study | 316| 70 (22.1)             | 140 (44.3)  | 106 (336) |
6. Debate

6.1. Features of this software are [12].

First of all, the picture brings a good visual feeling. Because the picture editing software is used to cut the picture, the composition is processed to make the theme prominent, novel and tidy, and also marked next to some themes in the picture, so that the emphasis is clear. There are also some buttons related to the background pictures in the software, also to use the picture processing software, because the beauty of the layout and uniform style also have a very important impact on the effect of use. After that, the animation is well made, the abstract theory is well expressed, and the abstract teaching content and complex working principle can be visualized and visualized. Animation is a kind of information of movement change, which can attract students' attention, enhance learning stimulation, adjust learning rhythm, and make students maintain high learning enthusiasm. When making, just conceive the relevant content that needs to be animated into a simple script and design a good mirror, and design the main body of the content into a simple and characteristic figure. Secondly, background music provides a good learning environment, and beautiful pictures constitute the basic elements of art education [13]. Art education is an indispensable part of comprehensive education and an important means to improve the comprehensive quality of cross-century college students. It can not only cultivate college students' feeling, appreciation, expressiveness and creativity of beauty, but also cultivate college students' healthy thoughts, emotions and lofty moral customs, and promote the construction of spiritual civilization in colleges and universities.

6.2. Technical aspects

In addition to Photoshop, there are Firework processing pictures, so that the picture to achieve better processing results. 2D animation production related software is mainly FLASH, this is a powerful vector animation production software, but also the main animation production software in software production. The animation volume made by the software is not only fierce, but also can be used for network dissemination, which is in line with the development requirements of the information age. Some third-party software applications are also added to make the animation effect of the software more lively.

7. Classroom application of medical immunological CAI software
CAI software of medical immunology is applied to the classroom teaching of three-year clinical medicine, and the students' feedback is good. During the course of using CAI software in class, we should use the teacher's language well, sum up, summarize or ask questions in general and concise language, and deal with the relationship with other teaching methods, such as proper use of blackboard, wall chart, projection, etc [14,15]. By using flexible and diverse methods to guide students to find problems, analyze problems and solve problems, so as to arouse the enthusiasm of learning, enliven the classroom atmosphere, combine the intuitive image of CAI software with the traditional methods organically, and achieve twice the result with half the effort in teaching. In addition, we should fully consider the rules of students' thinking activities, observe the students' expression of accepting knowledge, grasp the rhythm of software demonstration, give play to the function of "stop, advance, fast, slow, repeat" and so on, avoid turning "full house irrigation" into "full screen irrigation ", and fully reflect the main role of students' learning and the leading role of teachers [16].

8. Conclusion

The current medical students are a social group with rich personality. They are active in thinking and open-minded, unwilling to follow blindly. They like new things and dislike rigid preaching. From the point of view of the teaching content, the basic course teaching of immunology test, the schoolwork is heavy and all is theoretical knowledge, inevitably feel boring. Therefore, the quality of teaching effect is often directly related to the gain and loss of teaching methods. CAI plays a very good role in updating teaching means and strengthening teaching effect.

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