Analysis of Problems and Causes in the Design and Application of Classroom Teaching Courseware in Medical Colleges and Universities*

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Abstract—This paper analyzes the problems existing in the teaching courseware of higher medical education in China. From the perspective of the process of teaching application, there are mainly six problems: First, there is confusion between subject and object in classroom teaching; second, there is no fine processing of the information on multimedia courseware; third, teaching courseware neglects the pursuit of beauty in detail; forth, the courseware template does not match the theme; fifth, the color is not properly matched; sixth, the introduction of animation is improper. This paper analyzes these six problems and draws the two main reasons as follows. Firstly, the reasons for the teachers themselves, including the inaccuracy of the subject and object, lack of multimedia teaching courseware design principles, design ideas, and ineffective use of inappropriate teaching strategy. Secondly, there is a lack of evaluation mechanism, management mechanism and training content for systematic training teachers the campus culture atmosphere in which the teacher is located. This paper takes these questions as a starting point, and seeks the effective dissemination of teaching courseware design and production ideas, in order to enrich similar research.

Keywords—higher medical colleges; teaching courseware; application concept; cause analysis

I. INTRODUCTION

With the advancement of society and the continuous development of science and technology, especially the wide application of Internet broadband technology, graphics processing technology and WYSIWYG software technology, the teaching materials and teaching resources of higher medical education have been effectively constructed, integrated and shared. With the participation and cooperation of various commercial software companies and training institutions, China's higher medical education teaching courseware has made a qualitative leap, but there are also many problems in China's higher medical education teaching courseware.

II. PROBLEMS IN THE COURSEWARE OF HIGHER MEDICAL EDUCATION

A. Confusion Between the Subject and Object of Classroom Teaching

Higher medical classroom teaching courseware should be an auxiliary tool for classroom teachers. The main body of higher medical classroom teaching is the classroom teacher, and the audience is the students in the classroom. This determines that the teaching materials of higher medical classrooms should be designed with the teaching principle of "teaching as the mainstay", supplemented by the classroom teaching courseware based on learning, which make the higher medical classroom teaching courseware help the classroom teachers to visualize and concrete some abstract and professional problems, and effectively reconstruct the students’ understanding, memory and cognition, so as to promote understanding and memory of knowledge of the students in the classroom, in order to improve the effectiveness of classroom teaching. [1] However, from the results of the survey, most of the class teachers regard courseware as a carrier to reduce their own books, and even more, every sentence that is to be said in the class is written on the courseware, and when the class is taught, the class is taught. The interaction between teachers and students lacks passion and sincerity. In this classroom, which relies too much on courseware information as a carrier, students' attention is concentrated on the jumping of information. Students lack understanding of new knowledge, lack of thinking, association, association, deconstruction and reshaping, and students' limited ability to receive information. In a short period of time, we need to receive a large amount of course information. Over time, students lose their initiative and initiative, and lose critical thinking about information.

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B. Courseware Information Has Not Been Finely Processed

The content of higher medical teaching courseware is complicated and lacks the fine processing of the teacher. Throughout the time, most of the higher medical teaching courseware has basically become the lecturer of the class teacher, and has not undergone any processing in the layout, resulting in the listing and presentation of large-scale text information. Such classroom teaching information is large, lacking the key points and difficulties of classroom teaching, increasing the cognitive load and memory burden of students in classroom teaching, and reducing the learning efficiency of students in the classroom; [2] on the other hand, the courseware design lacks a logical structure. It is easy for students to be confused. In the process of making medical teaching courseware, the teacher often puts a lot of teaching information into his own teaching courseware. Some of them do not have time to integrate and optimize, and they use the courseware directly to the classroom teaching, which leads to the unclear logic of classroom teaching. Students can't have a whole overall understanding of the logical structure and level of the courseware. Together with the various hyperlinks in the courseware, it not only makes the students easy to be confused, but sometimes makes teachers themselves do not know to what they need to teach, which makes the teacher lost the direction of the classroom teaching objectives, greatly reducing the effectiveness and direction of the lecture. [3]

C. Attention Should Be Paid to the Content of the Courseware and Neglecting the Requirements for Beauty in the Details

Higher medical teaching courseware focuses on the content of courseware and neglects the pursuit of beauty in detail. It is understandable that higher medical teaching courseware emphasizes the arrangement of content, but it is not advisable to pursue the statement of content alone and ignore the pursuit of beauty. When the courseware changes from the cognitive aid to the art of the teachers and students in the classroom, it can give students in the classroom a sense of physical and mental pleasure and beauty, thus deepening the memory and impression of the students in the classroom, so as to improve students' learning efficiency. The pursuit of aesthetics in this perspective includes PPT layout design, interface design, color selection and combination, while higher medical teaching courseware often lacks the pursuit of aesthetics in these details, resulting in monotony and dullness of teaching courseware. There is a lack of artistry which can open the window of the teacher and the student to communicate.

D. Inappropriate Templates and Topics

Under the beautiful template coat presents the opposite of the course style tone and the content of the classroom teaching. The theme thoughts that teachers should express in the courseware are not unified, giving students a sense of abruptness. In order to promote the sharing and exchange of resources, the teachers can easily get the teaching course template they want on the Internet, but it is also found that in the higher medical teaching class, many teachers have beautiful teaching templates, but the content and theme do not match with their teaching content, such as a relaxed and pleasant teaching content with a dull template, or a pathological mechanism and case placed on a pleasant, colorful template, diluting the theme of the lecture, and losing the sacred mission of multimedia teaching courseware to highlight the classroom atmosphere at critical moments.

E. Improper Color Matching

Color matching in higher medical teaching courseware has constantly occurred at the time. This color mismatch is reflected in the improper color matching of the fonts in the courseware; the color of the picture in the courseware is not properly matched with the overall style, and even the color of the font and the picture and background color in the courseware are not much different. When the students are in the process of identification, there will be certain difficulties in recognizing the content and reading. In the second aspect, the instructor did not consider the effect of the projection of the projection bulb, the difference between the projection and the color display on the display, the color of the text could not be highlighted from the background color, the color difference was insufficient, and the key and important phrases were not in the entire line of text, highlighted in the middle. The third is that there are too many colors under the same slide. Some teachers like to put all kinds of colors on one page. The original intention is to increase the richness of the layout. The result is counterproductive, resulting in chaos in the perspective and easy visual fatigue, reduce the effectiveness of classroom teaching. In short, the interface design and color matching are not harmonious enough. The interface design and color matching are not harmonious and unified: First, the interface structure lacks balance. The multiple elements presented in the courseware appear disorganized, lacking a grasp of the overall conception and balance of the picture, and no uniform appearance on the repeating elements on the courseware. Second, the main color of the color is not highlighted; the use of color is more complicated and chaotic, which is easy to cause visual fatigue of the students in the classroom, affecting the aesthetic and teaching effects of the courseware.

F. Improper Introduction of Animation

Improper introduction of animation in higher medical teaching courseware will reduce students' attention. The right amount of animation can arouse the attention of the students in the classroom, but some of the teachers have placed too many animations on their own courseware. The original intention is to attract the attention of the students, and the result is counterproductive. Excessive animation makes the students' attention focus on the continuous change process of the animation, while ignoring the understanding of the content and the reconstruction of the knowledge, so that the students do not remember much about the content of the course, but remember the animation content of the audience, distracting students' attention and reducing the effectiveness of classroom teaching courseware.
III. ANALYSIS OF CAUSES

There are many reasons for the improper application of advanced medical teaching courseware. The main reasons found through analysis are as follows:

A. Teacher's Own Reasons

The teachers of higher medical teaching courseware are lacking in the design, production and use of courseware. This literacy include the grasp of the subject and object of the lecture, the design principles of the relevant courseware, the grasp of the mind, and the grasp of the use of effective teaching strategies.

1) Inaccurate grasp of subject and object: After many years of observation and analysis, the teachers used in the teaching courseware of higher medical colleges often grasp the subject and object of classroom teaching, resulting in the deviation of the use of higher medical teaching courseware. The instructors did not present the courseware according to the original intention. They did not use all kinds of media reasonably to render the classroom atmosphere, and did not create effective teaching situations, so they did not attract students' attention. The theme of the lecture is turned into the video, audio, animation and other multimedia elements of the courseware, rather than presenting the teaching ideas of the teacher. The multimedia elements such as video, audio and animation that play an auxiliary role have become the main subjects of classroom teaching in higher medical colleges. The material of the courseware is not well organized to support the classroom teaching. The attention of the students is submerged in various classroom materials, which distracts the students' attention and makes the form of multimedia classroom teaching larger than the teaching content. Although the multimedia courseware can display the teaching content visually and intuitively, not all classroom teaching content needs to be presented by multimedia teaching courseware. The teacher must also reserve a certain space for thinking. Because some courses require students to think about themselves, they also need students to have some imagination to expand. In the classroom teaching process, some students need to think deeply. If the teacher does not give the students time to think and present the answers to the students too quickly, it will reduce the exercise and development of the students' thinking. The students' thinking is imprisoned in the teacher. The courseware information is presented during the course.

2) Lack of design principles for courseware: Higher medical teaching courseware has many similarities with other teaching courseware, and it has its own unique features. In the process of design, the instructor must follow the corresponding basic principles to make it conform to the basic rules of teaching, including the analysis of classroom teaching content, the careful design of the logical structure of courseware, the interactive arrangement of teachers and students, the order of presentation of various elements in courseware, and effective teaching strategies. The teaching strategy is an important means related to the success of teaching. Different teaching content, logical structure, interactive function, multimedia and interface presentation is closely related to the teaching design of the courseware. According to the different focuses, there are two kinds of teaching strategies: one is the teaching strategy based on teaching; the other is the teaching strategy based on learning. The teaching strategy adopted in higher medical classroom teaching should be dominated by the "teaching-based" teaching strategy, and the reason is that teachers are the dominants in classroom teaching. From the perspective of students, teachers should carefully design and arrange the teaching courseware to attract students' attention, stimulate students' interest and assist the teaching in inquiry learning and research learning, so as to consolidate the key points of teaching and analyze the doubts. The teacher should work hard to expand the students' knowledge and abandon the role of the book text carrier; the courseware structure of the classroom teaching needs to be effectively designed according to the students' original cognitive foundation and learning style. [4] In the process of classroom teaching, the teacher cannot simply emphasize the nonlinear teaching method. The linear teaching structure has its advantages and its shortcomings. Similarly, multimedia teaching courseware also has its shortcomings and advantages. The actual teaching content selects reasonable branches, paths, and sequences for effective teaching. Before analyzing relevant knowledge points, the instructor should consider whether this will cause the students to jump in the randomness of thinking, although the multimedia teaching courseware has nonlinear characteristics. However, whether it is linear or non-linear teaching, it is necessary to take practical teaching as a starting point. The presentation of multimedia elements also needs to have a theoretical basis for teaching. The teacher should design according to the teaching strategy and choose the appropriate teaching content, which depends on the understanding and analysis of the students' existing ability starting point and cognitive level. Sometimes a simple picture, or a simple symbol, can touch the spark of the student's thoughts, and even a simple animation can solve the complexity of the student's cognitive reconstruction. In the interface design of the courseware, it is necessary to learn more about the aesthetics, search for the multimedia teaching coursewares of other excellent teachers, imitate and learn from others and gradually form their own characteristics and development. "Multimedia information designed in accordance with the psychological work of people is more likely to produce meaningful learning than multimedia information that is not designed in accordance with the psychological work of people." This is the conclusion of the American contemporary educational psychologist and cognitive psychologist Richard E. Mayer in his research. [6] Because of the cognitive theories of multimedia courseware,
Paivio's dual coding theory, Baddeley's working memory model, Engellkamp's multi-module theory, Sweller's cognitive load theory, Mayer's multimedia learning theory, and Nathan's animation theory, it is the theoretical design principle that classroom teachers need to follow in the process of designing multimedia teaching courseware. There won't be much analysis here. [7]

a) Lack of simple design principles: Simplicity is the first principle of classroom courseware design. Since the main function of the teaching courseware is to assist the instructor to teach, it will be necessary to pay attention to simplicity when designing. The simpler the better, the simpler is to better expand, broaden the students' thinking and connect more knowledge about the development zone. The principle of simplicity mainly follows the Magic Seven principle. Its content mainly includes the following aspects:

- No more than 7 keywords per page in the variable teaching courseware, 5 keywords can be the best in expression, 7 keywords will be fit. The brain burden of students will be too heavy if the key words are more than 9.

- It is best not to change lines of a paragraph in the courseware.

- The text in the title is best with only 5-9 words, and the class teachers in the class will expand the title.

- Only the main points can be listed in the classroom teaching course. It is not necessary to put every sentence of the teacher in the courseware.

- The content of the text in the courseware should not exceed 10-12 lines, and be controlled within 5-6 lines.

- Punctuation and other unnecessary symbols can be omitted as long as they do not affect the understanding of the students in the classroom.

- It need to be carefully when using English abbreviations or specialized terms that the audience does not understand with caution, if there are, they need to be made clear to the students.

It can be seen from the above seven principles of magic that the simplicity of higher medical teaching courseware is the guiding function of courseware, avoiding the chaos in the process of presenting courseware. [8] The main teaching goal of the class is to let students acquire new knowledge. This is the purpose and standard of using multimedia teaching courseware in classroom teaching. It is analyzed that the classroom teaching courseware of the current teachers in higher medical colleges generally lacks the design idea of the principle of simplicity.

b) Lack of design principles consistent with psychological reading habits: In the process of making courseware, the teacher needs to consider the students' psychological reading habits. Good psychological reading habits are the basic rules of the general audience. Good psychological reading habits are in line with reading psychological expectations and the psychological reading of the audience. The important thing is to maintain the consistency of the course design elements. The most common mistake in higher medical teaching courseware is that it is not consistent, and the layout is disorganized. The easiest thing for students to be confused is that the courseware is constantly changing throughout the page-changing process. The title, font and paragraph size of each page are different, and the title and paragraph are not uniform in alignment; some projects have too many numbers, and the use of colors is not conducive to the unification of the theme style. Countermeasures and suggestions: it will be necessary to abandon the overuse of the page change animation; if it does not help the courseware display theme, it is not recommended to use animation; it should unify the title text size, font, and color; it should also unify the text font size, font, color; it will be more clear to unify the item number size, color and pattern; the color and size of the text should be unified in the courseware; the theme color should also be unified in the courseware; it will be clear to use the uniform style template and remove other unnecessary style template styles. [9] In the process of making classroom teaching courseware, the instructor can make the above teachings to meet the reading habits of students.

c) Lack of clear design principles: The principle is clear and simple, so that students can know the logical structure of the courseware content at a glance. In the process of teaching higher medical teaching courseware, the most taboo is to let students guess too much about the next lecture content of the class teacher. In fact, in the process of teaching the class, the students must be able to guess the next content, and let the students have a little surprise and gain. Such teaching courseware can attract students' psychological needs. If the content on the courseware is too much and too complicated, it can be used a lot of ways to spread too much content on several pages. Related research shows that a complex page understands the content and logical structure inside it. It takes more time and effort than to understand a few simple pages. So teachers can choose the methods they like:

- Matching the slides with great pictures;

- First using emotions to impress students, then using logic to persuade students;

- Grasping the students' attention on the course and avoiding the teacher's loss of opportunities to continue communication with the students.

Secondly, another effective way to be simple and clear is to visualize the courseware: Visual: this means to use a large enough font to make each student see clearly; Interest: this means the class's enjoyment while teaching, by the means of using charts, patterns and colors to enhance the enjoyment of classroom teaching courseware; Simple: In classroom, the content of the courseware is simple and clear, highlighting key concepts; Useful: this means to help teachers and students to keep the synchronization of ideas; Accurate: this means that the content of the classroom courseware should
be consistent with the content of the materials used by the students, reducing the anxiety of the students; Long: this means to let the students have a deep impression on the content of the courseware. [10]

d) Lack of design principles for gathering attention: Teaching courseware should gather the attention of students. Attracting students’ attention can be effectively designed from the following aspects: highlighting the key. If the text is difficult to compress and refine, teachers can choose other ways or means to highlight the key information of the article, so that students are deeply impressed by the core content. These methods and approaches include the typesetting of texts and the proper use of table graphics. For the keywords in the text, the font size should be increased by 2-4 characters to play the role of highlighting the characters, or the colors should be different from other characters to highlight the keywords, or bold to increase the emphasis on keywords, or italics. For example, the title of the Song typeface in the text is replaced with a boldface to highlight the effect of its emphasis. Although the underline also plays an important role, some studies have shown that it has a great interference with reading, so in the course of courseware production, it is recommended to use less or not of the underline. Secondly, the single text emphasis method has limited effect. It can be combined with text refining, reducing line breaks,bolding, discoloration, and increasign font size. On the basis of keeping it simple and clear, it needs to be clear at a glance. In the course of students’ lectures, too much information is prone to fatigue, and the introduction of appropriate amount of animation helps to gather students’ attention. However, too many animations flickering and flying in special effects will only distract students from the content. Therefore, using less or not special effects is an effective way to gather attention. Once again, the use of artistic fonts can easily break the balance and overall style of courseware design. It is also recommended to use less or not. The key to the use of classroom teaching courseware is to firmly grasp the attention of students.

3) Lack of design ideas: The characteristics of higher medical teaching courseware are mainly: there is more information presented, so the structured and logical teaching content is particularly important. So what is the way to enhance the logic and perspective of classroom teaching courseware? First of all, in terms of logic, the classroom teaching courseware should conform to the students’ cognitive thinking, and the content arrangement needs to conform to the order of view: from top to bottom, from left to right. That is, the eyeball order of the students to browse the courseware: generally from top to bottom, from left to right; first charts and then the paragraph content; first look at the chart and then read the text; first look at the highlighted part and then look at the other. Simply put, the teachers can optimize from the three aspects of profession, clearness and concision, profession = high quality picture + professional template + correct use; clearness = unified typesetting + simple and clear logical structure + novel transition and explanation of the content; concision = suitable master + visual concept. Secondly, an important part of the higher medical teaching courseware is to deal with the use of pictures in the courseware. The use of the pictures has the following advantages:
- It can make the layout have visual impact;
- it can make the courseware more story-rich;
- it can increase students’ immersion;
- it can enable students to better understand the information to be conveyed by the theme;
- it can directly incite the students’ hearts;
- it can make it easier for students to remember the theme;
- it can promote students’ mobility.

So how can the teachers make the picture more of design ideas? The visual degree of animal pictures is higher than that of still life pictures; the visual degree of real high-definition pictures is higher than that of false pictures; the visual degree of creative pictures is higher than that of plain pictures; the pictures that can associate with the theme are higher than the beautiful pictures. These are the design ideas that are currently lacking in the design of higher medical teaching courseware.

4) Lack of teaching strategies: Because the teachers of higher medical colleges mainly come from the field of medical profession, there is a lack of systematic learning of the principles of education, education and teaching design. On the basis of the basic education and teaching theory, it is especially important to design an effective teaching strategy. So what is an effective teaching strategy? The broad teaching strategy includes both the "teaching" strategy and the "learning" strategy. The narrowly defined "teaching" strategy in this paper is an integral part of the teaching design, that is, to achieve the teaching goal in a specific teaching situation, teaching program plans and teaching implementation measures tailored to the cognitive needs of students. [3] Instructors in higher medical colleges, in the process of making courseware, the first step are that they need scenario analysis. Because if the teachers don't understand their students, they can't think of the logical structure of the classroom teaching courseware, and it is easy to get rid of the actual application. Therefore, the instructor can ask themselves from the following 12 aspects:
- Why do you want to demonstrate this courseware?
- What kind of students do you want to convince?
- What are the students interested in?
- What information teachers want to pass the most?
- What is it?
- What is the value exchange point between teachers and students?
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- Are students familiar with the content and materials of courseware?
- What kind of material form do students like to present?
- What materials can the teachers use at this stage?
- Do students have resistance to the topics in the courseware?
- Did the student have a similar introduction?
- Number, age, and gender of the student?
- What is the grade of the student and the existing cognitive foundation?

In the second step, teachers need to think about the problems that ordinary people would not think about when conceiving slides:

- Do you have to use courseware to assist in this lecture? - Is there a better way to express it?
- Must courseware be the form to present? - Is there any other better presentation?
- Is the ambient light in the classroom good? - Is it necessary to use a design with high contrast?
- Is there a color difference in the projector at the lecture location? - Is there some color scheme that can't be used?
- What do students get after the teacher finishing his teaching? - Is it effective to deliver information or knowledge?
- What is the next preparation after the teacher finishes? - Did the goal of the lecture reach the expected goal after the presentation?
- When are you going to use the courseware for demonstration? Is it more important to use the courseware to make the correct presentation at the right time than to simply do a good classroom courseware? etc.

These are the teaching strategies that are generally lacking in higher medical teaching courseware.

B. The Campus Culture of the Teacher

The above is an analysis from the classroom teaching process, but the campus culture atmosphere of the higher medical college where the teacher is located also plays an important role. The reasons for the analysis include the following two aspects:

1) The school lacks the curriculum and content of the system training teacher: Due to the strong professionalism, the teachers of higher medical colleges lack the content of systematic training of multimedia teaching courseware. The management departments of higher medical colleges need to take care of each other and increase the training content of the teacher's training on multimedia teaching courseware in the training of teachers. On the one hand, the teaching management department organizes the classroom teachers to participate in the training outside the school, and the training treatment has been improved, so that the teachers in the school have the opportunity to participate in the training opportunities and broaden the horizons of the teachers. It is also possible to hire an off-campus expert to carry out training lectures on the campus, and reward the corresponding task-creating multimedia courseware production workload based on the professional development of the teacher, so as to promote the enthusiasm of the teacher. On the other hand, the content of the training needs to be appropriately adjusted to adapt to the development of modern society. For example, the rise of mobile media and self-media now provides convenience for the production of multimedia teaching courseware for teachers in higher medical colleges. Therefore, the content of the training is to find some multimedia teaching courseware making tools that can be seen by the WYSIWYG. It integrates teaching ideas, teaching strategies, teaching principles, integrated art foundation and technological innovation to avoid the simple production training of multimedia teaching courseware. It is necessary to combine the latest technology with the actual teaching application of teachers, carry out all-round training on the design, development, use, management and evaluation of multimedia teaching courseware for teachers in higher medical colleges, and cultivate the modern education and teaching concept of the teachers.

2) Lack of classroom teaching course evaluation and management mechanism: From the questionnaire survey, the campus culture atmosphere in which the teacher is located lacks the evaluation and management mechanism of the teaching courseware. Such a campus culture environment and atmosphere will lead to the irregular use of higher medical teaching courseware. At present, there is no effective evaluation mechanism for the teaching courseware and its use effect produced by the teachers in higher medical colleges, which leads the teachers to design and use multimedia teaching only in their own habits and feelings in the course of making multimedia teaching courseware without a standard can be relied upon. There are also some shortcomings in the management of courseware for teachers in higher medical colleges. There are complicated reasons for this: First, the teachers in higher medical colleges lack the opportunity to participate in the multimedia teaching courseware competition, and they are not highly valued by the relevant teaching authorities in the school and the province. Secondly, there is a lack of targeted courses in higher medical colleges. The platform for the management and evaluation of teachers' multimedia teaching courseware and the courseware between the teachers did not reach the role of sharing and mutual reference. At the school level, a library of courseware teaching resources should be established to benefit more teachers and students, encouraging teachers to share teaching resources, and establishing corresponding incentive policies. Then, higher
medical colleges lack professionals who are responsible for this work. At the school management level, the multimedia teaching courseware and the application of teaching effects of the teachers in higher medical colleges should be statistically evaluated and set an example. It will be important to actively explore the evaluation system of teaching courseware in higher medical colleges, refine the mechanism of evaluation, effectively explore the scientific, practical, effective, artistic, and technical aspects of multimedia teaching courseware, and carry out evaluation among teachers. All these methods are to let the students in the class participate in the relevant appraisal and establish a reasonable evaluation index and system. At the same time, more teachers are assigned to participate in multimedia teaching courseware training and conferences inside and outside the school and in and outside the district to ensure the level of multimedia teaching courseware and the improvement of teaching effects of the teachers in higher medical colleges.

IV. CONCLUSION

In general, the use of teaching courseware in higher medical colleges mainly has the above six aspects of performance, and the external campus culture environment also has two reasons: First, medical college teachers lack systematic training and professional training; Second, there is no dedicated sharing and management platform, and there is no effective management mechanism. The above is the analysis of the problems and causes in the courseware of higher medical education. Further research is needed for further discussion.

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