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Exploration on the construction of network teaching platform of "Pharmaceutical practical instrument analysis"

Xu Guangyu, Li Hongyu, Sheng Yu, Wang Huanqi*, Yuan Guangxin*
College of Pharmacy, Beihua University, Jilin, Jilin, 132013 (CHINA)
Email: 1134442770@qq.com, yuanguangxin2007@163.com

ABSTRACT

Pharmaceutical practical instrument analysis is a professional required course set up based on characteristics and needs of pharmacy in our college. The contents of pharmaceutical practical instrument analysis course are various and complicated, involving a wide range of knowledge, so that it is difficult for the students to learn it. In this study, a network teaching platform of pharmaceutical practical instrument analysis was established to promote the exchange of teachers and students, improve the students' interest in learning, and expand their knowledge. The results indicate that the teaching platform has become a better teaching aid in the teaching of pharmaceutical practical instrument analysis. It is necessary to constantly sum up the experience, innovative the teaching method, and gradually explore new ways of knowledge construction suitable for students in colleges and universities.

KEYWORDS

Pharmacy; Instrumental analysis; Network teaching platform; Teaching module; Exploration.
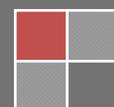
INTRODUCTION

Pharmaceutical practical instrument analysis is a professional required course set up based on characteristics and needs of pharmacy in our college. It is composed of two parts, the theoretical teaching and experimental teaching, and focuses on the teaching of the structure, basic principles and operation methods of various instruments commonly used in pharmacy disciplines. The course covers more complicated and abstract contents, so that in the traditional classroom teaching process, it is difficult to use images, animations, video, simulation software and other materials as the tools to show the structures and working principles of instruments, but those that are elusive are demonstrated with blackboard to the students, which can not vividly present the process of instrument operation, indicating that there is an problem of insufficient interaction between the learner and the learning content.

With the rapid development of computer network technology, the teaching through network and with multimedia has become a major trend that can be inevitable in the development of modern education [1, 2]. Computer networks have built a good technical platform for the realization of diversification, real-time on-line and interactivity of multimedia network teaching [3, 4]. The application of online courses can promote the sharing of educational resources and provide a personalized learning environment for learners to achieve a broader interactive learning, so that the building of online courses has become a major issue in the field of education [5, 6]. At present, colleges and universities in our country have set up online courses to improve teaching quality through using network technology. In this paper, the online course of pharmaceutical practical instrument analysis was taken as an example to design the network course guided by a blended learning thought with a combination of it with the traditional classroom teaching, to provide students with a personalized learning teaching platform [7]. The design was effectively implemented in the teaching process, the practical experience was summarized, and the corresponding countermeasures for the specific application of blended learning thought in the guidance of construction of online courses were put forward.

NECESSITY TO BUILD THE NETWORK TEACHING PLATFORM

Pharmaceutical practical instrument analysis is an important pathway for students to learn working principles, structure and operation of a variety of instruments. However, the intellectulization of many large precision instruments makes students rarely access the internal structures of instruments, so that it is not easy for them to understand their working principles and functions. In order to improve the quality of teaching, it is necessary to build a multimedia network teaching platform for pharmaceutical practical instrument analysis to solve the problems in the teaching. In addition, the course pharmaceutical practical instrument analysis is characterized by an active development and rapid update of the knowledge, which requires the teaching content constantly to be renewed [8]. By using such network curriculum, the teachers can combine the research with the teaching of subject, in which on the one hand, scientific research achievement can be directly transformed into the network course teaching, on the other hand, the practice of teaching can provide some theoretical thinking and method for the research, reflecting a complementary relationship between the research and the teaching. Furthermore, the students can learn about the trend in the subject progress for the first time to keep up with the speed of knowledge update.

EXPREMENTAL

Construction of the network teaching platform

Design ideas of the online course

The following principles were followed when the course was designed: first, the conformity principle that the division of knowledge modules was to meet the intrinsic logical system of the subject and the cognitive characteristics of students; second, the open principle that the courses should be open,

and the course resources could be updated or adjusted at any time to; third, the interactive principle that the autonomy and collaboration of the course were fully considered to make the effective communication and discussion between teachers and students, and among students possible.

Construction of the online course

When pharmaceutical practical instrument analysis online course was built, the advantages and disadvantages of two methods, namely, the online course and the traditional classroom teaching were carefully taken account into, particularly in the resource supply of online course, the learning style, the meeting to the personalized learning, and the depth and the breadth of course content, and simultaneously, the learning-centered and student-centered course was also given full consideration to. The structure of course was laid out by taking the knowledge points as the core of modules and the course contents were organized in a navigation structure. The performance practices included characters, pictures, video and simulation experiment forms, which could make the students convenient to obtain the required information and achieve the reorganization of teaching contents to meet learning needs of the students with different levels. The online course structure is shown in Figure 1.
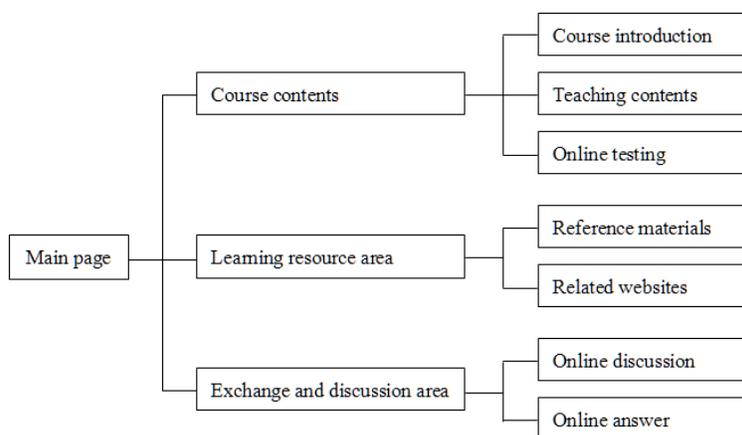

Figure 1 : Network teaching structure chart of pharmaceutical practical instrument analysis

1 Course content area:

Course content area contained three modules, that is, the course introduction, the course contents and the online testing. The navigation structure was used to organize the pages of teaching contents and they linked to the related teaching units. The course was established in the form of special topics and the teaching content of each special topic was designed to contain learning objectives, learning tasks, learning activities, teaching suggestions and learning activities. The students could self-learn to complete the activities simply based on the activity program to finish the learning of a special topic. There were designed modules in each topic. Module one: the contents learned in classroom were reviewed. The main purpose of this designed activity was to strengthen the basic theoretical knowledge for those who were insufficient in the preparation of theoretical knowledge, and these theoretical knowledge covered theoretical principles and instrumentation working principles of various equipments. Module two: animated video and DV video, which were designed to show structures, working principles and operation procedures of the analytical instruments. Module three, simulation experiments of the analytical instruments showed with simulation teaching software. In the process of analytical instruments, the students were allowed to perform the simulated operation of the instruments on computers, to enable them to understand the structure of the instrument, working principle and application methods preliminarily. The students were required to preview the experiments of instrumental analysis, which might make up the lack of large instruments in the demonstration experiment of them and neglect the damage to the equipments due to the unskilled operation of students.

Module four: extended learning that could provide students with a wider range of learning resources. These resources were all latest research advances and applications of the analytical instruments and could undoubtedly greatly widen the students' horizons in this field. The online testing and the test database were designed to consolidate the knowledge points introduced in the module through the exercise.

2 Learning resource area:

There were mainly reference materials and related websites in this area. The reference materials related to this course included various forms of documents, pictures, video, and simulation software. The related websites included carefully selected contents related to the course and websites associated with the knowledge expansion, excellent resource library and forums.

3 Discussion exchange area:

It mainly included online discussion and online answer. In order to promote a better communication and interaction between the students and teachers and between the students and students, an exchange column was designed, and the teachers could give guidance and answer to the students based on the discussion at any time.

RESULT AND DISSCUSS

The network teaching platform of pharmaceutical practical instrument analysis was built and opened to the pharmacy undergraduates in our university in 2011. After the platform was applied for three years, the implementation results of it were evaluated through the usual observation, questionnaires and interviews.

1. Increase in the learning interest

As shown in TABLE 1, the students' interest in the learning of the course has changed since the application of online course platform.

TABLE 1 : Effects of the network teaching platform of pharmaceutical practical instrument analysis on the learning interest (*n*=216)

Learning interest	Number	percentage
Improved	125	57.9%
Slightly improved	82	37.9%
No effect	9	4.2%

2. Improvement of the learning outcomes

1. Cognition on the platform in the improvement of learning outcomes

The results showed that the students believed that the network teaching platform should be helpful in the improvement of the students learning outcomes of pharmaceutical practical instrument analysis, as shown in TABLE 2.

TABLE 2 : Effects of the network teaching platform of pharmaceutical practical instrument analysis on the learning outcomes (*n*=216)

Learning outcomes	Number	Percentage
Improved	149	69.0%
Slightly improved	63	29.2%
No effect	4	1.9%

2. Helpful in the students' knowledge construction

The construction of knowledge is inseparable from the interaction between old and new knowledge, but also more inseparable from the collaboration and exchange. By using the network teaching platform to assist the teaching to extend the time and space of learning, the deep thinking and wide communication of students can be facilitated. The exchange between the teachers and students, and between the students and students, can help students deepen the understanding of their existing knowledge and enhance the application of the knowledge, to promote the effective construction of knowledge. The questionnaire results showed that 59% of the students believed that the application of network teaching platform could significantly help to deepen the understanding and application of knowledge.

CONCLUSIONS

The development of network course teaching is very quick. It is beneficial to the constant improvement of the construction of network teaching basic resource, and the practical teaching and management. It is believed that the construction of network course teaching is a systemic project. To establish a comprehensive network teaching platform, there are a lot of work experience to accumulate. Therefore, it is essential to keep track of advanced equipments, educational philosophy and educational means, and continuously research and apply advanced technology to build the network teaching system of instrument analysis. An attempt was made to use a network course teaching platform and a combined learning mode of the classroom learning with the network learning to, achieve a good result of the teaching. Of course, there are still some problems in the actual implementation process, so that it is necessary to constantly sum up the experience, innovative the teaching method, and gradually explore new ways of knowledge construction suitable for students in colleges and universities.

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