Scientific Practice-An Exploration of Education Mode on Training of the Talents of Traditional Chinese Medicine

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Abstract. Cultivating college students’ innovation ability is the demand of higher education in the new century, and also the important symbol to measure the quality of education at universities. Recent years, through the project of ‘National personnel training mode innovation experimental area’, with the innovation education idea, undergraduate practical teaching reform was applied in Chinese Pharmacy major (CPM) in Jiangxi University of TCM, to cultivate the students’ innovation ability and exploring spirit. The fifth semester was as the period of scientific practice, no theoretical courses were arranged in this semester. Students choose the laboratories and teachers they are interested in to carry out scientific research and practice. In the end of the practice the students should make a presentation to clarify what they have done and what harvest they got during the scientific practice. It is believed that most of the students in CPM in the university have improved their innovation ability after the scientific practice comparing to the students who didn’t evolve in the practice. The education mode on training of the talents of traditional Chinese medicine provide a new way to cultivating the innovation ability of university students in a new time.

Introduction

With the acceleration of economic globalization, the voice of requirement of modernization and internationalization of Traditional Chinese Medicine (TCM) industry is louder and louder. Preferential development of TCM with independent intellectual property rights has become the common view in medicine field in China. As a result, cultivating high quality TCM Talents has become an urgent task for the higher education of TCM. In China, a large number of TCM industry leaders have been cultivated since 50s last century, who played an important role in the field of TCM. But for a long time, the education mode on CPM has followed the mode of Pharmacy major, which resulted in the lack of characteristic of TCM and innovation ability of students in CPM, and became a bottleneck restricting the development of TCM industry.

For the specialty of CPM, no experience or reference before us. So the new mechanism of combination of production, learning and research was considered as the foundation, the innovative thinking, consciousness and practice ability were as the three essentials, the education mode of scientific practice was applied in Jiangxi University of TCM to cultivate the students in CPM.

The Goal of the Education Mode of Scientific Practice

Students in CPM were as the subject investigated, and scientific projects meeting with the market demand were as the carrier to cultivate the students’ practical and innovation ability. The relative teaching plan, methods and evaluation should be promoted through the new mode to form systematic theories and achievement.

Theoretical Basis

Based on Constructivism theory, the knowledge could be acquired not only from teachers, but also through means of meaning construction[1,2], with the helps from others(including teachers and
partners) and using necessary learning materials[3]. *Circumstances, Cooperation, Conservation* and *Meaning Construction* are the four basic factors in learning[4]. So during cultivating the talents, the circumstances of meaning construction should be constructed, the cooperation between teachers and students, students themselves should be strengthened, the conservation between the members in leaning groups should be emphasized, and finally to help students to get a profound understanding of the nature and law of things and the inner connection between the thing and other things[5,6].

Under the direction of the Constructivism theory, four aspects were considered in cultivating the students in CPM. The first is the combination of quality education and professional competence, the second is to pay attention to students’ self motivation, the third is to outstanding students’ subject status, the fourth is to dock the industry demand of TCM and talents cultivation.

### Training Mode

All students in CPM were cultivated with professional learning plus scientific practicing. The mode could be concluded as ‘1212’.

The first ‘1’ means basic courses learning period (from the first to the fourth semester). In this period, the basic theory course were studied, the purpose is to strengthened the students’ culture quality, scientific quality and basic knowledge.

The second ‘1’ means professional courses learning (from the sixth to seventh semester). After scientific practicing in the fifth semester, students got more perception of professional acknowledge, which help them to better grasp the professional theories in this stage of learning.

The second ‘2’ means graduation practicing period (the eighth semester). Through the three periods of theory learning--scientific practicing--theory learning, students could promote their manipulative and innovation ability better and do well in their thesis design.

![Training Mode](image)

**Figure 1. Training mode.**

### Training Methods

#### Optimizing Teaching Program

The program of cultivating talents in CPM was adjusted to adopt the need of scientific practicing. The theory courses in seven semesters were adjusted to be finished within six semesters. Students in CPM were all required to evolve in scientific practicing in the fifth semester. Undergraduate stage of learning was divided into ‘Learning (Teacher teaching)—Practicing (Scientific practicing under
the guidance of teachers)—Learning again (Teacher teaching)—Practicing again (Graduation practice).

Training for Students

Establishing ‘Chinese Medicine Lecture Hall’. Except for the final presentation, students in different lab would be chosen randomly to make a periodic presentation to introduce the research progress during their scientific practicing. The purpose is to improve their communication skills and motivate students in groups.

Practicing ‘Scientific Research Zero Distance’. All students were encouraged to design and finish a small scientific projects by themselves, with the necessary help from their guidance teachers who were only permitted to guide no more than two students at one time. The purpose is to make students completely experience scientific research process, cultivate students’ correct attitude on scientific research and promote their independent learning ability.

Carrying out ‘Self Diving in the Sea of Learning’. All students were required to study one course called Analysis of Chinese Medicinal Preparations on their own. The purpose was to exercise and examine the students’ ability to study independently.

Training for Teachers

According to the need for cultivating Chinese pharmacy talents, a special training system for teachers was established, including academic exchange, periodically training, etc and so on.

Formation of Cultivation Documents and System

In order to promote the teacher’s education and students’ learning wisdom, the Instructors Manual for teachers, Program of scientific practicing for students, Special program of pre-lab training, Selecting subjects system were compiled or designed to guide teachers and students to adapt to the training mode as soon as possible.

Instructors Manual for teachers. Summarizing the successful teaching experience and excellent teaching skills of previous guidance teachers, and proposing strategic suggestions and instruction about teaching and managing in scientific practicing.

Program of scientific practicing for students. Including three programs in stages of training, practicing and summarizing. In each program, specific works were presented to make students know better what they should do during the period of scientific practicing.

Special program of pre-lab training. Including the program of basic experimental knowledge training (one week) and laboratory equipment training (one week). Through basic experimental knowledge training, students could grasp the basic theories and experimental knowledge and know how to read and analysis the literature, write summary, design experiment plan and etc. Through laboratory equipment training students learned how to operate the basic laboratory equipment correctly.

Selecting subjects system. ASP dynamic web technology and SQLSERVER2000 data base were applied to design the selecting subjects system. Through the system, teachers could compile the
selected topics, students could select and declare the subject they want, administrators could overall manage the numbers of subjects and students, examine and approve the selections.

**Training Effectiveness**

The education mode of scientific practicing have been continued for thirteen years since 2003. At the first 3-4 years, the effectiveness was not so obviously as we expected, for example, the results of questionnaire showed that the student’s interesting in professional learning remained only 25%. To resolving this problem, the subject on how to motivate the students’ passion for professional learning was studied, it was found that students could get the maximum benefit only in the whole group through group motivation and authority incentive. So the learning exchange mode in class, eg, Chinese Medicine Lecture Hall, was established, and since then, the index of student’s interesting in professional learning increased by 62.40%.

As for another aspect, during scientific practicing, some guidance teachers couldn’t make a good distinction between guiding an undergraduate in scientific practicing and a graduate student. The guidance teacher just gave ideas at first, which made students know nothing about what they should do in the process of practicing. To resolve the problem, the educational reform subjects about how to correctly guide students in scientific practicing were studied, and teachers were organized to exchange their experience regularly. Recent years, the results of questionnaire showed that most students were satisfied with their guidance teachers.

Furthermore, the college students' innovative ability structure model was established to analyze the knowledge structure among students at different major under different innovation education environments. The results stated that, comparing to students in other majors without scientific practicing, students in CPM showed significantly better in internal innovation personality and external innovation behavior.

Based on the analysis of the annual questionnaire, the students evolved in scientific practicing believed that through the practice, their ability in practical, consulting literature materials and writing thesis increased, the professional knowledge improved either.

![Diagram](image)

Figure 3. The Questionnaire results.

**Summary**

Scientific practicing was one of the education mode we proposed which specific to the students in CPM. Research have shown that this education mode could improve the students’ ability of autonomous learning, academic literacy and overall ability, guarantee the talent training quality, comprehensively promote the teachers and students grow together.
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References


