Journal of Education and Development; Vol. 6, No. 1; March, 2022
ISSN 2529-7996 E-ISSN 2591-7250
Published by July Press

Discussion and Optimization of Teaching Practice of Chemistry of Chinese Materia Medica Based on Student-Centered and Big Health Industry

Jianbo Sun[1]

[1] State Key Laboratory of Natural Medicines, School of Traditional Chinese Pharmacy, China Pharmaceutical University, Nanjing, China

Correspondence: Jianbo Sun, State Key Laboratory of Natural Medicines, School of Traditional Chinese Pharmacy, China Pharmaceutical University, Nanjing 211198, Jiangsu, China. E-mail: sunjianbo@cpu.edu.cn

Received: February 22, 2022 Accepted: March 23, 2022 Online Published: March 30, 2022

doi:10.20849/jed.v6i1.1074 URL: https://doi.org/10.20849/jed.v6i1.1074

Abstract

Chemistry of Chinese Materia Medica (CCMM) is a discipline that uses the basics of chemistry and other related disciplines to study the effective substances of traditional Chinese medicine. With the advancement of the modernization of traditional Chinese medicine, the scientific research platform of CCMM have been significantly improved. Thus, the progress of the traditional Chinese medicine industry, especially the rise of the health industry has been promoted. With the help of resources such as MOOCs and micro-classes, the teaching method of CCMM is realized by flipped classrooms, which truly breaks the boundaries between in and out of class, online and offline, making "The study of CCMM" everywhere. This teaching mode can effectively enhance students' interest, increase effective learning time, and greatly improve teaching efficiency and effects.

Keywords: Chemistry of Chinese Materia Medica, traditional chinese medicine health, MOOC resources, flipped classroom

1. Introduction

Chemistry of Chinese Materia Medica (CCMM) is a subject that studies the chemical structure, physical and chemical properties, structural identification of effective substances in traditional Chinese medicine (Ding, K., Yu, S.-Y., Shen, H.-R., Dou, M.-H., Jiang, Y.-Y., & Liu, B., 2019; Wu, D.-F., & Ding, Y., 2016). The research object of CCMM is the medicinal material basis of traditional Chinese medicine (TCM) in preventing and treating diseases, such as guanfu A in aconite root, ginsenoside in ginseng and taxol in *Taxus chinensis*, et al. (Zhou, Z., 2013). The emergence of CCMM can guide new drug researchers to search for lead compounds from TCM, and to develop new drugs with good treatment of diseases by means of structural modification and pharmacological and toxicological methods (Zhou, Z., 2013).

In the traditional teaching system of CCMM, students usually sit below and listen carefully to the teacher's teaching. Classroom is too rigid, with fixed class time, fixed class schedule, and fixed time for course exams, which makes most students study for the final assessment. Students are in a passive state of receiving knowledge, and their learning process is often confined to the rigid classroom system. Those who are interested in CCMM may listen carefully and have a strong interest in studying the problems mentioned in the teacher's explanation process. For those who don't like CCMM, this traditional teaching method will make them feel boring, forming a vicious circle, and over time, they will feel disgusted with CCMM course.

However, with the popularization of modern teaching tools such as information technology, computers or intelligent terminal devices, and the rise of high-quality teaching resources such as massive open online course (MOOC) and microlecture, students can easily find these three sources of teaching resources online. In addition, the popularity of modern teaching tools has broken the geographical and time-space limitations of CCMM teaching, and the classroom has been extended to any place covered by information. Otherwise, students can freely according to their original study plans at different times. In learning, even when they encounter difficult problems and feel a headache, students can solve their doubts through online Q&A and forums for help.

2. Put Forward the Concept of Student-Centered Teaching

The popularization of modern teaching tools does not encourage students to leave the classroom. In the same way as traditional classroom teaching methods, the task of teachers is still inseparable from creating a good classroom atmosphere for students. Therefore, this requires that in the teaching process, we must change from the teaching mode of teaching as the main body to the student-centered teaching concept, encourage students to actively participate in the teaching process, dare to ask questions, and exercise the ability to analyze and solve problems, change the way students passively accept knowledge, so that students can clearly understand how to learn (Li, W.-F., 2013). In addition, this teaching method also requires organize interesting and colorful teaching practice activities in the teaching process, create a strong learning environment for students to learn, and stimulate students' interest in learning (Wang, F., 2015).

Teaching CCMM with students as the center is a development trend of such a discipline in the future. This requires the academic affairs department and teachers to make revolutionary changes to the traditional teaching model. First, the class hours must be increased, and then the library must purchase enough information for students to consult, so that students no longer rely on obtaining knowledge from teachers. Instead, ask the teacher for advice when you encounter problems that you don't understand, and change the passive learning mode into an active learning mode, so as to improve students' learning efficiency and learning quality of CCMM (Chen, F., 2016; Liu, L., 2013). The traditional teaching mode is a teaching method in which students preview before class, study in class, review after class and final exam (Yin, Z.-Y., 2017), while teachers who teach CCMM with a student-centered and modern teaching mode can communicate through many networks. Forms such as Dingtalk, MOOC online interaction and WeChat can establish communication between teachers and students, and between students and students. The teacher's responsibility is to make students familiar with and like to use this new teaching mode to interact with teachers and students, and to build a good platform for students to acquire knowledge and develop all-round life.

3. The Connection Between the Big Health Industry of TCM and the Discipline of CCMM

3.1 The Development of TCM Health Industry

TCM is a unique medical resource in China and a resource with huge market potential (Ren, Z., & Huang, X., 2013). Since the 18th National Congress of China, the development of TCM has become a key target of national development. Medical and Health Service Development Plan (2015-2020) and other documents (Zhang, B.-L., Zhang, J.-H., Chen, S.-L., Duan, J.-A., Huang, L.-Q., Sun, X.-B., … Xue, X.-J., 2017; Zhang, X.-D., 2015). With the advancement of modernization of TCM, the scientific research platform and level of TCM have been significantly improved, which has promoted the progress of related industries (Zhang, B.-L., Zhang, J.-H., Chen, S.-L., Duan, J.-A., Huang, L.-Q., Sun, X.-B., … Xue, X.-J., 2017).

The big health industry of TCM refers to a series of health products, including food, medicine or equipment manufacturing industry including finished products, health food and deep processing, as well as the production, sales and service supply of health service industry (medical services, management and consultation) (Ren, Z., & Huang, X., 2013). As an excellent cultural tradition and important ecological resources, TCM will play an important role in the development of the great health industry.

The "One belt, one road" proposal will facilitate the development of the large health industry of TCM and the growth of international trade in Chinese medicine. It should be noted that the promulgation of the law on TCM has provided effective legal guarantee and policy support for the development of the great health industry. The development and promotion of the great health industry will not only promote the development of TCM, but also become an important force in the construction of a healthy China. American economist Paul Zane Pilzer called the big health industry the "Fifth wave of wealth" in the world, second only to the IT industry. It will be a pillar industry to promote global economic development in the future (Pilzer, P. Z., 2015).

3.2 Chemistry of TCM and Big Health Industry

In 1972, researcher Tu Youyou of China Academy of Traditional Chinese Medicine successfully extracted artemisinin from *Artemisia annua* L. by means of Chemistry of TCM. The drug and its derivatives have saved millions of lives around the world, especially in developing countries. In October 2015, researcher Tu Youyou stood on the podium of the Nobel Prize in Physiology or Medicine, becoming the first Chinese to win the Nobel Prize in Science (Wei, X., & Zhou, J., 2016).

Using the research knowledge of effective chemical components in TCM learned in the discipline of CCMM, we can clarify the material basis of effective TCM with good activity, explore the principle of disease prevention and treatment, clarify the principle of compatibility, promote the deepening of theoretical research on the

properties, and clarify the processing principle of TCM according to the changes of components (Liao, G.-F., Li, P.-Y., Li, B., Wei, J.-H., & Lu, R.-M., 2021; Xiong, S.-S., & Gong, Q.-F., 2013). In addition, CCMM also plays an important role in the marketization of TCM. It can establish and improve the quality evaluation standards of TCM, such as the quality control of compound preparation. It can also improve the dosage form of TCM preparation and improve the drug quality and clinical curative effect (Wang, R.-Z., 2006). The future development of Chemistry of TCM will coordinate with the healthy development, absorb the theory and traditional experience, adopt various new technologies and methods, and pay attention to the separation of active ingredients with activity as an index. From the research of single Chinese herbal medicine to the development of Chinese herbal complex, we can find medicine and Chinese medicine large health products which are effective in treating and preventing diseases such as cancer, AIDS, cardiovascular and cerebrovascular diseases, and other diseases that affect human health and survival.

In addition, we should strengthen the teaching of basic theory and applied research of CMCC, focus on solving the key problems in the teaching of Chemistry of TCM, and promote the development of the teaching mode of this discipline. So that the research level of active ingredients, especially the basic research of active substances, the structural modification of lead compounds and the evaluation of quality standards of TCM can be significantly improved. Otherwise, it can be better serving the related industry, and make Chemistry of TCM better provide obvious advantages for the development of Chinese medicine health industry.

4. Research and Realization of New Teaching Mode of CCMM Under the Current Trend

The great health industry is inseparable from the close combination of CCMM and related disciplines, and the integration of pharmacology and toxicology. The research on chemical components will be divorced from the practical significance of drug research and development and the development of great health industry. By mastering the theoretical and practical ability of CCMM and closely integrating it with the work of the great health industry, Chinese researchers can bring effective modern products of TCM to the world, and promote TCM to enter the international mainstream market as soon as possible. However, at present, the teaching of CCMM in colleges and universities still follows the traditional teaching mode. Due to the low enrollment batch, student source structure, teachers' comprehensive quality and professional academic level. In addition, students' enthusiasm and initiative in school learning are not enough and learning efficiency is low, which greatly affects the quality of talent training closely related to the great health industry of TCM in the future.

In the information age, a variety of new teaching modes such as microlecture, MOOC and flipped classroom (Lü, M.-Y., Xu, Z.-X., & Qian, Y.-Y., 2020) have sprung up. They make the traditional teaching concept no longer have a market, but systematically and orderly classify the learned content, which is in line with the learning psychology of students to acquire knowledge in the current scientific and technological environment (Lü, M.-Y., Xu, Z.-X., & Qian, Y.-Y., 2020). MOOC has the characteristics of large-scale teaching, open analysis and so on. It is found that the typical MOOC that can realize large-scale knowledge dissemination has the characteristics of elite teachers, diversified objects, integrated platform, fragmented knowledge, autonomous learning and diversified evaluation. In the Flipped Classroom teaching method, students acquire knowledge through group discussion, which is the real digestion and absorption of knowledge, so students can remember it accurately and completely, and understand it deeply in the application process (Yu, H., Shen, L., & Liu, L., 2016).

The implementation of Flipped Classroom based on MOOC resources makes the rigid teaching classroom full of interest and activity, so that each student can find his own role in the process of acquiring knowledge. MOOC provides rich knowledge points and excellent problem-solving ideas in the teaching of CCMM. Flipped Classroom provides students with the best learning resources and discussion platform before and after class. The combination of the two teaching modes transforms students' role into the leader of teaching. The mutual cooperation of this new teaching mode of CCMM has greatly improved students' sense of participation and promoted students to study actively, efficiently and comprehensively, and solved the problem of learning methods.

5. Conclusion

With the help of MOOC and Microelecture resources, Flipped Classroom is used to realize the teaching form of CCMM, truly realize the student-centered teaching and learning, realize the students' real active learning for interest, make the learning of CCMM ubiquitous, and promote the consolidation and application of knowledge and ability. This information-based teaching model can effectively enhance students' interest in learning, change students' from never wanting to learn to eager to learn, increase students' effective learning time, and greatly improve the teaching efficiency and effect. It is an effective way for the transformation and upgrading of Application-oriented Universities and the implementation of teaching reform.

References

Chen, F. (2016). New Standards of Quality Assurance in European Higher Education: Concepts and Inspirations. *China Higher Education Research*, (6), 92-96.

Ding, K., Yu, S.-Y., Shen, H.-R., Dou, M.-H., Jiang, Y.-Y., & Liu, B. (2019). Improving the Teaching of Chinese Medicine Chemistry. *Improving the Teaching of Chinese Medicine Chemistry, 35*(1), 41-43.

Li, W.-F. (2013). On the cultivation of protagonists in senior high school history classroom. *Kaoshi Zhoukan, 36*, 129.

Liao, G.-F., Li, P.-Y., Li, B., Wei, J.-H., & Lu, R.-M. (2021). Exploration of Chinese Medicine Chemistry Experiment Teaching Based on the Cultivation of Innovative Talents. *Guangdong Chemical Industry, 48*(6), 175-183.

Liu, L. (2013). Teaching reform and exploration of flash course in Higher Vocational Education. *China Computer & Communication*, (1), 214-215.

Lü, M.-Y., Xu, Z.-X., & Qian, Y.-Y. (2020). Application of Flipped Classroom in Pharmaceutical English Teaching. *Pharmaceutical Education, 36*(4), 68-71.

Pilzer, P. Z. (2015). *The New Wellness Revolution: How to Make a Fortune in the Next Trillion Dollar Industry.* Wiley.

Ren, Z., & Huang, X. (2013). Promote the development of traditional Chinese medicine industry into a big health industry. *Journal of Traditional Chinese Medicine Management*, (5), 371-371.

Wang, F. (2015). Exploration and practice of mathematics classroom teaching in junior middle school under the new curriculum standard. *China Extracurricular Education*, (6), 91-91.

Wang, R.-Z. (2006). Talking about the significance and effect of traditional Chinese medicine chemistry research in traditional Chinese medicine modernization development. *Guangming Journal of Chinese Medicine, 21*(3), 1-2.

Wei, X., & Zhou, J. (2016). Research on the training mode of architectural talents in Colleges and Universities Based on the national innovation driven development strategy. *Course Education Research*, (12), 174-175.

Wu, D.-F., & Ding, Y. (2016). Introduction to Teaching Chinese Medicine Chemistry. *Guangdong Chemical Industry, 43*(17), 217-217.

Xiong, S.-S., & Gong, Q.-F. (2013). Two thoughts on the development of decoction pieces of traditional Chinese Medicine. *Jiangxi Journal of Traditional Chinese Medicine, 44*(9), 54-55.

Yin, Z.-Y. (2017). The discipline construction of traditional Chinese medicine should follow its own laws. *China Higher Education*, (7), 48-50.

Yu, H., Shen, L., & Liu, L. (2016). Research and implementation of a new student-centered teaching model. *The Science of Leadership Forum*, (31), 463-464.

Zhang, B.-L., Zhang, J.-H., Chen, S.-L., Duan, J.-A., Huang, L.-Q., Sun, X.-B., … Xue, X.-J. (2017). A Development Opportunity and Strategic Thinking for the Comprehensive Healthcare Industry of Traditional Chinese Medicine. *Engineering Science, 19*(2), 16-20. https://doi.org/10.15302/J-SSCAE-2017.02.003

Zhang, X.-D. (2015). Strive for more support from the state in the 13th five year plan of traditional Chinese Medicine. *Journal of Traditional Chinese Medicine Management*, (9), 10-10.

Zhou, Z. (2013). Thoughts on the teaching design of history. *Read and Write Periodical, 10*(12), 150-150.

Copyrights