

Analysis and Thinking of the Construction of Higher Vocational Natural Medicinal Chemistry Online Courses

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Abstract

With the continuous improvement of China's economic level, the progress of science and technology provides new ideas for education and teaching reform, and online courses based on information technology have gradually become the focus of school teaching. Especially in the teaching of vocational colleges, for the discipline system of natural medicinal chemistry, the teaching effect should be further improved, the quality of classroom teaching should be improved, and the defects and deficiencies of classroom teaching should be fully made up for and improved. It plays a certain role in promoting and promoting the improvement of students' practical skills and knowledge literacy, and truly cultivates students of vocational colleges into high-quality application-oriented talents.

Keywords

vocational colleges; Natural Medicinal Chemistry; Online courses; construction analysis; Practical thinking

1. Introduction

With the advancement of science and technology, traditional classroom teaching models are no longer adequate to meet the demands of quality education and core competencies, and they also present contradictions with the construction of modern teaching systems. Especially in recent years, the COVID-19 pandemic has made in-person teaching in schools uncertain and dangerous. In this environment, online courses based on the internet have gradually gained widespread attention from universities, especially vocational colleges. In their teaching practices, schools have consistently adhered to the principle of "learning continues despite school closures," striving to appropriately compensate for the shortcomings and deficiencies of in-person teaching through online learning, truly contributing positively to students' sustainable development. With the progress of the times, vocational education curriculum reform needs to explore new development paths, starting with online courses, actively innovating and upgrading online teaching models to ensure the diversification and quality of the entire online teaching platform. Currently, influenced by various factors, vocational education has gradually moved away from the previous singular teaching model and development approach, moving towards informatization and personalization. As teachers in vocational colleges, it is even more necessary to keep up with the times, actively combining the characteristics of subject courses with students' cognitive characteristics and interests to explore new teaching methods, fully leveraging the positive impact of the internet on students, and utilizing information technology to create high-quality online open courses. This study will primarily focus on the discipline of natural product chemistry in higher vocational colleges. Through analysis and research on the online course system, it aims to provide teachers with new ideas for teaching innovation, truly

ensuring that online course teaching in higher vocational colleges can achieve optimal results, and thus providing feasible suggestions for relevant personnel.

2. Existing Problems in Teaching Natural Product Chemistry

2.1 The teaching content is boring

In actual teaching, natural product chemistry, from the perspective of the discipline's characteristics, primarily utilizes modern methods and theories, supported by relevant technologies, to study the effective components of natural drugs. This often involves complex concepts, and the chemical structures of different drugs vary during chemical component analysis. Furthermore, understanding and mastering the principles of chemical reactions presents significant challenges for students. While traditional teaching methods have incorporated the advantages of information technology, effectively integrating PowerPoint presentations into the subject, the inherent limitations of PowerPoint, coupled with the complexity and diversity of the discipline, prevent the overall teaching from achieving ideal results. Therefore, it is necessary to innovate and upgrade traditional teaching models to better adapt to the objective realities of modern education and truly optimize teaching effectiveness. Under the traditional teaching model, students' learning interest cannot be effectively stimulated, and the entire classroom appears rather dull and tedious. Since vocational colleges are important institutions for cultivating high-quality applied talents, using traditional teaching methods makes it difficult for students' development to meet the actual needs of the workplace.

2.2 The teaching methods are monotonous

Natural product chemistry is a discipline inherently unique and complex. In practice, innovative upgrades are essential for effective teaching. However, traditional rote learning methods fail to adequately emphasize student agency, and the teacher-dominated classroom environment often falls short of expectations. Most teachers focus solely on classroom instruction, neglecting pre-class introductions and post-class extensions. This results in superficial teaching, with students' learning remaining merely at a distance, significantly diminishing the overall teaching effectiveness. Both pre-class introductions and post-class extensions require teacher guidance. Teachers must tailor their teaching to students' cognitive characteristics and learning progress, conducting systematic student analysis and applying appropriate teaching methods throughout the pre-class, in-class, and post-class phases. This diversification of teaching models actively promotes the sustainable development of modern teaching reform.

2.3 Lack of school-enterprise cooperation

Vocational colleges differ from higher education institutions in their talent cultivation practices. The primary goal is to cultivate high-quality, application-oriented talents, requiring students to achieve a true integration of theoretical knowledge and practical skills through a certain period of academic study. However, currently, vocational college teaching still faces limitations and inconsistencies, resulting in relatively low overall teaching effectiveness. From the perspective of natural product chemistry, teaching primarily focuses on analyzing and exploring the structure and physicochemical properties of natural medicinal components and mastering extraction methods. The curriculum typically consists of theoretical and practical courses, aiming to cultivate application-oriented talents with strong abilities in natural product extraction and development. However, with the deepening development of education, teachers have failed to innovate teaching methods in line with current trends, and students' technical skills and knowledge have not received adequate training. Therefore, in this context, school-enterprise cooperation is essential to maximize and optimize the effectiveness of the curriculum.

2.4 The evaluation method is too simplistic

When evaluating students' teaching, a diversified and real-time teaching model can better reflect the actual learning situation of students. However, in the current teaching of natural medicinal chemistry, the course assessment model is mainly based on the final exam. At the same time, when evaluating students' practical skills, the experimental class is usually used as the main evaluation venue, requiring a systematic assessment of students' comprehensive performance. The main body of this evaluation method is the teacher. Although the teacher can play a certain guiding role for students, the teacher's subjectivity is too great in the whole teaching process, which may make the whole

evaluation result not truly objective and fair. In terms of evaluation type, closed-book exams or after-class exercises are traditional evaluation methods, which are often difficult to attract students who are greatly influenced by the Internet at this stage, and cannot play a certain role in promoting students' interest [1].

3. Implementation Path of Online Course Construction in Natural Product Chemistry

3.1 Restructuring Teaching Content

Compared to traditional classroom teaching, online courses are typically conducted in the form of micro-lessons, which are generally five to ten minutes long. The duration must be kept within an appropriate range; both excessively long and short lessons will not have a substantial positive impact on teaching effectiveness. Therefore, given the characteristics of online courses, the time constraints must be considered during the teaching process. The teaching content needs to be innovatively reconstructed, especially by simplifying complex concepts and truly utilizing fragmented teaching to improve learning outcomes. This allows students to break free from the time and space limitations of traditional teaching and truly move towards flexible learning. For example, when explaining methods for extracting drug components, different extraction methods can be combined to create personalized micro-lesson videos. Similarly, when analyzing and researching types of natural chemistry, the content can be segmented within the overall knowledge points, thereby improving classroom teaching effectiveness, enhancing the interest of teaching, and broadening students' knowledge to varying degrees.

3.2 Reconstructing the Teaching Process

From a model perspective, online courses are primarily used for online teaching. In practice, they can also supplement offline teaching to ensure the orderly and smooth implementation of various teaching activities. When innovating and restructuring the entire teaching process using online courses, effective measures and methods are needed to organically integrate pre-class, in-class, and post-class activities, allowing them to influence and interact with each other to optimize the overall classroom effect. Before class, teachers mainly need to present learning tasks, while students primarily complete the corresponding tasks assigned by the teacher during online learning. This connects to offline teaching, and after class, upgraded and extended tasks should be released online, maximizing students' exploration and innovation. Secondly, online courses should be used to restructure the entire teaching process, especially by appropriately updating and adjusting the offline format based on actual circumstances. In the specific teaching process, teachers should mainly use project-based learning and problem-based learning methods to design and research the entire classroom teaching, maximizing the advantages of the flipped classroom approach, allowing students to optimize learning outcomes, providing specific answers to questions during the learning process, and summarizing relevant knowledge points. Finally, after class, teachers should also combine the specific situation of the subject, give full play to the significant advantages of big data, conduct a comprehensive study on the students' learning situation, so as to truly find the weak points of students in the learning process, and ensure that the whole classroom teaching can develop in a personalized way by arranging teaching tasks in a targeted manner. Secondly, teachers can also organize students to carry out one-on-one activities, so that students with better academic performance can take the initiative to help students with poor academic performance. Through mutual help among students, the whole teaching goal can be completed according to the plan, and the spirit of mutual help among students can also be cultivated in this process. In addition, by utilizing the development of online teaching activities, the whole teaching process can also be reconstructed, and the flipped classroom teaching can be completed using the blended teaching model, so that students can get rid of the absolute dominance of teachers and become the main force of classroom learning, further stimulating students' learning interest, improving students' learning enthusiasm and initiative, enhancing students' teamwork spirit, and also exercising students' ability to discover and solve problems [2].

3.3 Constructing a teaching model that combines school-enterprise cooperation with work-study integration

When vocational schools engage in practical teaching, they need to strive for a unity of theory and practice, and an integration of work and study. This is especially true for higher vocational colleges, which should strengthen cooperation and exchange with enterprises to improve teaching outcomes. Online courses should be designed with enterprise mentors in mind, incorporating practical needs. These mentors can participate in online teaching activities,

enabling remote instruction and leveraging the advantages of information technology. Through the live streaming function of teaching apps, they can achieve a seamless connection between the enterprise and the classroom. Furthermore, they can utilize the equipment advantages of enterprises, uploading videos of large-scale instruments and equipment to the online learning platform to provide appropriate assistance to students. For example, when teaching natural product chemistry, schools primarily use glassware for reflux extraction, while enterprises often require the use of large-scale instruments and equipment in their practical operations. During the teaching process, teachers need to provide detailed explanations of glassware techniques based on the actual situation and create videos to aid student learning. In addition, online course teaching platforms should be used. Enterprise mentors can actively create rich teaching practices in accordance with the characteristics of the entire subject course. In specific practical teaching activities, they can simulate the enterprise to plan and design production instructions, while students must accept the corresponding instructions to complete practical operations, and truly improve the optimization effect. For example, when explaining the natural ingredient extraction and separation method, it is required to carry out teaching activities based on the actual development of the enterprise and specific cases. Enterprise mentors should simulate the enterprise's production process to carry out practical teaching. In the teaching process, through the combination of work and study, students' practical hands-on ability can be truly improved, laying a solid foundation for cultivating specialized high-quality applied talents [3].

3.4 Enrich student learning evaluation materials and evaluation system

Evaluation materials are often rich and diverse. In the process of actual application, they can effectively improve the interactivity of the whole classroom learning, thereby optimizing and improving the teaching effect. By using information technology, we can give full play to the advantages of evaluation and carry out diversified evaluation. Evaluation materials can be made into online games. Relying on the online course learning platform, we can use mobile phones to scan relevant QR codes and complete relevant evaluation activities in the form of games. Secondly, when conducting evaluation activities, we can also take pictures of common mistakes in daily life and make them into corresponding videos, guide students to watch the videos online, and find out the errors in the videos in time, so as to truly help students master relevant knowledge and skills. In addition, we can also use online teaching platforms to statistically summarize the knowledge points related to the course content in teaching, and then publish the final assignments and other content. After the unit learning is completed, teachers can guide students to compile mind maps based on the learned content, summarize the knowledge points of this unit, and then cultivate students' logical thinking ability [4].

4. Conclusion

Online open courses deserve widespread attention and importance in vocational education, representing a key focus and crucial aspect of curriculum reform in the information age. By leveraging the significant advantages of information technology, the teaching content of natural product chemistry can be redesigned and planned. In particular, micro-lectures can ensure the in-depth development of the entire teaching system, utilizing online platforms to complete pre-class, in-class, and in-class teaching content. Furthermore, flipped classrooms can be constructed using situational teaching methods and cooperative learning, truly making students the main participants in the entire learning process, maximizing their innovative abilities, improving their thinking skills, and promoting their all-round development.

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