

Exploration of the Teaching Reform of Polymer Chemistry Experiment under the Background of “Internet +”

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Abstract: Under the background of the continuous development of information technology, the digital technology in the teaching link of polymer chemistry experiment, has achieved some results, effectively improved the teaching effect, and gradually formed the new teaching concept and mode of “Internet + education”. After the development of this teaching mode, students will have more time to think in learning, reduce the difficulty of learning, improve learning motivation and strengthen classroom experience, so as to better understand chemical concepts and related knowledge. This paper explores the specific strategy of constructing digital classroom in polymer chemistry experiment teaching for its reference.

Keywords: Internet +; Polymer chemistry experiment; Teaching reform

It is pointed out in the outline of education curriculum reform and other documents that education and teaching work needs to conform to the development of The Times. Teachers should pay attention to the application of information technology in daily teaching work, give full play to the advantages of the Internet, build a quality environment for the development of students' learning and education work, and expand teaching auxiliary tools and channels. “Internet + education” refers to the use of information technology and network platform to optimize classroom teaching links, enrich teaching content, guide students to master the knowledge given by teachers in diversified educational resources, and strive to realize the all-round development of students.

1. Problems existing in the traditional polymer chemistry experiment teaching

Laboratory teaching is a key link to train polymer science professionals. Through the effective face-to-face communication between teachers and students, students can master the skills of experimental observation, data analysis, operation, strain and problem solving, and establish the spirit of group cooperation in the process of the experiment. After investigation and analysis, many colleges and universities have extended the free radical polymerization teaching to the four basic polymerization methods of bulk polymerization, solution polymerization, suspension polymerization and emulsion polymerization, so as to change the traditional experimental teaching mode and enable students to better master the polymerization technology. Under the traditional teaching mode, first of all, a full preview should be done before the experiment, and the preview report should be submitted to the teachers for review and correction. The teacher will first teach the basic principles, methods and action procedures of the experiment, and ask about the actual situation of the preview. Then, students need to make test equipment, weighing drugs, preparatory test, in the process of test, to carefully observe test performance, and make notes, if any problems, should timely consult the instructor, teachers will timely follow up the actual test condition, after the completion of the test, students need to write down the test results, so that later reference and analysis.

In the traditional experimental teaching process, after data processing and instrument cleaning, teachers should leave and evaluate the performance of students according to the experiment report and experiment process. However, there are some defects in this way, such as the lack of effective experiment management and effective experiment design. Under the traditional teaching mode, the polymer chemistry experiment teaching mainly exists in the following two aspects^[1].

1.1 The construction of the experimental platform is not standardized

Experimental class is a challenging process, and students usually only learn in theory class and lack practical opportunities.

Affected by the students' improper learning attitude, limited learning thinking and other factors, students themselves are easy to appear "high vision", therefore, during the assembly of instruments, often appear glass instrument broken, device center instability and other problems. In addition, the assembly of the experimental instrument is very stiff and slow, and these problems cause the trial to fail and waste a lot of time and drugs. For example, in the styrene suspended polymer test, the mixing rate and equilibrium of the mixer are the key factors affecting the appearance and performance of the finished product. However, some students failed to debugging in strict accordance with the requirements, mixer skew or close to the bottom, so that the test mixing effect is poor, in the late polymerization reaction, the viscosity of styrene oligomer will gradually increase, eventually form clumps, cannot be spread into small units with consistent grain size, so that the styrene suspension polymerization product size becomes uncertain, affect the accuracy and reliability of the test results.

1.2 The teaching and explanation process is not retained

In the traditional experimental teaching process, due to the large number of students, teachers can only arrange two groups to carry out basic experiments. Then, teachers will be students together, the relevant teaching content, important knowledge points, operation steps, however, the students themselves have large differences, understanding ability, learning ability is very different, teachers if not according to the actual situation of students, will lead to the experiment after weighing drugs, experimental device problems, even abnormal phenomenon in the process of the experiment, which requires teachers to take effective measures to solve these problems, to ensure the smooth progress of the experiment and the accuracy of the results. Due to the lack of effective experimental methods, students often only copy the steps of the book in the form when completing the experimental record and report, but without a detailed record of the experimental process, resulting in the experimental results are not satisfactory and can not achieve the desired learning effect.

2. Teaching reform strategy of polymer chemistry experiment under the background of "Internet +"

In the practice of curriculum reform, with the integration of information technology, teachers should be applied to "Internet + teaching experiment practice" "Internet + experimental operation demonstration" "Internet + teaching experiment questions solve" "Internet + teaching experiment conclusion" and "Internet +", to realize the teaching resources to cooperate with teachers and students' learning, improve the teaching quality and efficiency of polymer chemistry experiment. In order to improve the quality of practical teaching, teaching reform practice can be started from four aspects in order to achieve the best results.

2.1 The establishment of the "Internet +" teaching mode

By shooting video and pictures, the "Internet +" teaching mode of the main knowledge through the module setting, centered on experiment, combine the teaching content, and the experimental purpose, principle, requirements, matters needing attention, phenomenon analysis, results analysis and data processing methods of the main knowledge to organic combination, centered to the experiment, the organic combination of the main knowledge module, build "Internet +" teaching mode^[2].

In the process of building the "Internet +" teaching mode, the teachers should pay attention to the expansion of teaching resources, and encourage students to take the initiative to participate in the analysis and exploration of chemical experiments according to their own knowledge structure. Carefully analyze the actual learning situation and follow-up development orientation of class students, so as to collect more teaching resources, so that the "Internet +" teaching mode can give a full play to its role, and at the same time, strengthen students' core literacy of chemistry, to provide support for their subsequent development.

2.2 The exploration and practice of the "Internet +" teaching mode

The practice of "Internet +" key and difficult content system should be carried out from three levels: firstly, the practice in polymer chemistry curriculum, through rehearsal and demonstration, and suggestions from the perspective of "teaching"; second, from the perspective of learning, introduce "Internet +" knowledge point system, carry out experimental preview, experimental device construction and experimental operation demonstration, so as to improve students' experimental skills and enhance their practical ability."Internet +" teaching mode through the form of video and pictures, in QQ group and other platforms, to supplement the traditional teaching methods, and learn from it, collect students' valuable opinions and Suggestions, through the "Internet +" teaching mode effect analysis and improvement, help to improve the quality of teaching.

Through the practical research of "Internet +" teaching mode, valuable experiences and suggestions can be summarized to better

understand the relationship between “teaching” and “learning” under “Internet +” teaching mode. Meanwhile, teachers should focus on the problems in “Internet +” teaching, and develop “analysis-improvement-feedback-implementation-analysis”, so as to improve “Internet +” teaching mode, better serve learners and improve students’ learning interest and efficiency.

2.3 The application and promotion of the “Internet +” teaching mode

The core characteristic of teaching practice is to solve the key problems to improve the learning effect of students.”Internet +” polymer chemistry experiment teaching reform practice characteristic is: first, the Internet technology into the traditional teaching process, using the rapid development of computer technology and mobile communication tools and widely used, knowledge module mobile master, not only greatly enhance the effect of practical classroom teaching, also greatly improved the students’ learning experience. Second, “Internet +” mode can effectively improve the actual teaching efficiency, break the limitations of laboratory concentrated study and discussion, and can achieve demonstration and discussion, including video, photos, etc., in the Internet sharing platform, WeChat network platform, QQ network platform implementation demonstration and discussion, this way is simple, and does not need additional cost, can extend to any practice teaching and research topic, according to different course characteristics to make corresponding changes, in order to improve the learning effect.

In the concrete implementation of the “Internet +” model, these three aspects must be considered comprehensively to ensure the effective implementation of the “Internet +” model. first, To take the construction of experimental device, experimental operation process display, drug weighing process and experimental phenomenon research as the main knowledge points of modular design, Combined with video recording, picture production and other technical means, Constitute a complete and clearly structured “Internet +” teaching module, In order to better meet the needs of “Internet +” teaching methods; second, In order to realize the organic combination of “Internet +” and “teachers speak and students do” mode, And to improve the classroom effectiveness and students’ learning efficiency, Effective measures should be taken in the “Internet +” teaching process, To achieve the best teaching effect; third, Combining “Internet +” teaching with traditional teaching, It is the key to realize the “Internet +” teaching effect. Therefore, in order to effectively track and evaluate students’ learning effectiveness, it is necessary to establish a complete set of teaching effect evaluation system from the perspective of teaching and learning, so as to ensure the effective implementation of “Internet +” teaching^[3].

Conclusion:

To sum up, through the Internet teaching resource platform, teachers can provide teaching services in a diversified way to make up for the shortage of teaching resources in traditional teaching. The combination of the Internet and experimental courses not only can only increase students’ chemistry knowledge preparation, expand their horizons, but also stimulate their enthusiasm for learning experimental courses. This helps to cultivate students’ awareness of independent learning and teamwork spirit, and promote their ability to study and solve problems, so as to cultivate the applied innovative talents needed by the society.

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