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Exploration Of Quality Teaching Mode of Higher Vocational Chemistry Under New Media Technology

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Abstract:With the wide application and popularization of information technology, new media technology has become an important tool to improve the quality of education. Through literature review and field research, this paper aims to explore the quality model of new media technology in teaching higher vocational chemistry. It is found that the application of new media technology can improve students' learning interest and engagement and positively impact the understanding and mastery of higher vocational chemistry knowledge. Students' acceptance of the new media technology teaching model is high and has the potential for promotion and application. The final conclusion shows that the rational use of new media technology can enhance the effect and quality of higher vocational chemistry teaching, stimulate students' learning motivation, and promote the development of higher vocational chemistry education. This study provides lessons and references for higher vocational chemistry education and promotes the innovation and optimization of the teaching mode.

Keywords: New media technology, higher vocational education chemistry, teaching mode.

1. INTRODUCTION

With the rapid development and wide application of technology, more and more young people are active on new media platforms such as Jitterbug, AR, and WeChat. They not only seek entertainment and leisure on these platforms but also use them as a way to learn. According to the Short Video User Value Research Report 2022, in the post-flow era, the user penetration rate of new media platforms has reached 93.2%, and users prefer content about life skills, knowledge, and science, which become part of their fragmented learning.

Can new media technologies play an important role in the field of education? With the versatility and interactivity of new media technologies, the field of education has opened up entirely new opportunities and possibilities. In this digital era, chemistry teaching in higher vocational education (higher vocational) is also facing increasing challenges and demands.

Teaching chemistry at the higher vocational level faces multiple challenges. Traditional teaching methods and resources can no longer meet the learning needs of modern students. Students aspire to learn chemistry through more vivid, interactive, and multimedia approaches to enhance their interest and engagement in learning. In addition, the characteristics of higher education dictate that teaching and learning in this field need to be closely integrated with practical applications, thus requiring an effective teaching model that promotes students' understanding and mastery of practical applications.

In this context, the application of new media technology in the teaching of chemistry in higher vocational education has become particularly important. According to McLuhan's media concept of "The medium is the message", the use of any communication medium will have a great impact far beyond its content. Through the use of new media technologies, students can be provided with richer and more diverse teaching resources and learning experiences. For example, through the use of new media tools such as animation, modeling, simulated experiments, and virtual practice, abstract chemical concepts and experimental processes can be vividly presented to enhance students' understanding and memory of chemical knowledge. In addition, new media technologies can provide opportunities for personalized and self-directed learning, allowing students to learn according to their own learning pace and interests.

Therefore, this study aims to explore the quality teaching model of new media technologies in teaching chemistry at the senior level. Through literature review and teaching practice, we analyze the current situation and impact of new media technology in senior chemistry teaching and evaluate its effectiveness. In order to improve the quality and effect of higher vocational chemistry teaching, stimulate students' learning motivation, and promote the innovation and development of higher vocational chemistry education.

2. THE LITERATURE REVIEW

The application of new media technology in higher vocational chemistry teaching is increasing, and a variety of new media tools and platforms are widely used in classroom teaching and learning aids. Through the review of related literature, we can understand the following aspects of the application.

First, new media technology is widely used for knowledge presentation in higher vocational chemistry teaching. Yang Liguo (2023) and others used C4D software to create virtual animations of a three-dimensional methane structure model, conjugation effect in benzene molecule, and electrophilic addition reaction mechanism of ethylene and bromine, demonstrated its application in organic chemistry classroom teaching, and put forward the idea that 3D virtual animation can improve the classroom efficiency and learning efficiency. Che Xiquan, Ren Tiejun (2003) through the 3DMax in organic instrument modeling, demonstrate animation production to break through the limitations of two-dimensional space, to achieve the production of courseware to try and reform. Through the use of animation, virtual experiments and simulation software, and other multimedia teaching means, teachers can present chemical concepts and experimental processes in a more vivid and graphic way, thus increasing students' interest and participation in learning, and thus promoting their understanding and mastery of chemical knowledge.

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Secondly, new media technology has also been applied to practical teaching in higher vocational chemistry. Tang Sheng (2023) introduced the application of Yenka virtual experiment software in classroom teaching by taking the experiment of the effect of catalyst on the rate of chemical reaction as an example. Jia Bin (2021) found through practice that introducing microclasses into classroom teaching to break the limitations of time and space can effectively improve the efficiency and quality of teaching, and enhance students' active learning habits. With the help of virtual laboratory and simulation practice software, students can carry out simulations and practice of actual operation, and familiarize themselves with experimental steps and operation skills in advance. This practical teaching mode helps to strengthen students' practical application ability and problem-solving abilities and improve their practical operation level in the vocational field.

Third, new media technology can provide students with the opportunity for personalized learning and independent learning. Yun Wang,Xutao Zhang & Lijie Zhang (2023), Xiaofang Gao (2023) and Junhong Yang (2023) have studied the construction of online teaching platforms and online teaching modes. Sun Tian Linzi & Shen Shusheng. (2017) proposed that the purpose of MOOC learners' learning is not to complete the course, but only to acquire it selectively according to their actual needs. Through tools such as online teaching platforms, learning management systems, and e-books, students have the opportunity to learn according to their own learning progress and interests and to choose learning resources and learning modes that suit them. This mode of personalized and self-directed learning helps motivate students and develop their independent learning skills.

However, although new media technology has many advantages in the teaching of chemistry in higher vocational education, it also has certain limitations. Firstly, new media technologies require corresponding hardware and software support, and their introduction and maintenance costs may be high, requiring relevant facilities and technical support. Secondly, the use of new media technologies requires teachers to have appropriate technical and teaching skills, otherwise, the teaching effect may be affected. In addition, the use of new media technologies requires reasonable teaching design and integration of course objectives and student needs.

3. THE PROPOSED METHODOLOGY

3.1 The Research Design

In this study, a set of teaching practices were designed to assess the effectiveness and impact of new media technologies in teaching chemistry at the higher vocational level. In this teaching practice, Class 1 of the Pharmaceutical Preparation Technology program in a higher education institution was selected as an experimental class and Class 2 as a control class. In a certain final examination, the average score of class 1 was 68.67 and the average score of class 2 was 68.62, which shows that the student's learning level is comparable. The t-test was performed using IBM SPSS 27 and the statistics are shown in Table 1 below, which shows that T=0.032, P=0.974>0.05, so there is no significant difference between the two classes, and the experimental criteria are met.

Table 1: Data processing results before teaching practice

CLASSES	N	AVERAGE VALUE	STANDARD DEVIATION	95% CONFIDENCE INTERVAL OF THE MEAN		t	P
				LOWER LIMIT	UPPER LIMIT		
Class 1	47	68.67	9.155	-0.398	0.411	.032	.974
Class 2	47	68.62	8.191	-0.397	0.411		

3.2 The Results and Discussion

Therefore, traditional teaching methods and new media technology teaching modes were used to teach the two classes respectively. The following is our analysis of the practical results and discussion of the positive impact of new media technology in the teaching of chemistry in higher vocational education. In order to test the experimental effect, 94 questionnaires were randomly distributed respectively and 94 were recovered, and the Cronbach's coefficient was 0.890, indicating good reliability. The results of data processing after teaching practice, as shown in Table 2.

Table 2: Results of data processing after teaching practice

CLASSES	N	AVERAGE VALUE	STANDARD DEVIATION	95% CONFIDENCE INTERVAL OF THE MEAN		t	p
				LOWER LIMIT	UPPER LIMIT		
Class 1	47	83.65	8.937	1.400	2.375	9.168	<.001
Class 2	47	66.05	9.652	1.268	2.366		

As can be seen from the above table, there is a difference of 17.6 points in the mean score of the overall grades of the two classes, and the T-test result of P<0.001 shows that there is a significant difference between the two classes. From the point of view of learning achievement, students using the new media technology teaching mode showed more stable performance and higher overall grades and achieved better learning results. In the comparison of scores on various knowledge points, the average scores of students using the new media technology teaching mode were higher than the scores of students using traditional teaching methods. When encountering questions that require strong spatial imagination such as examining the ball-and-stick model of organic molecules, molecular formulas, structural formulas, electronic formulas, etc., as well as complex chemical reaction

mechanisms, students were able to achieve better learning results by using the new media technology teaching mode.

Based on the experience of the qualitative study, we compared the students of the experimental class and the control class in two aspects: classroom performance and after-class feedback. The comparison results are shown in Table 3.

Table 3: Results of the comparison of teaching practices between the two groups

FORMENTERPRISENew Media Technology Teaching ModelTraditional Teaching methodsLearning Interest and Participation Engagement	ENTERPRISENew Media Technology Teaching ModelTraditional Teaching methodsLearning Interest and Participation Engagement	New Media Technology Teaching ModelTraditional Teaching methodsLearning Interest and Participation Engagement	Traditional Teaching methodsLearning Interest and Participation Engagement
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	Student engagement in hands-on practice87%	87%72%Students' Acceptance Degree and FeedbackThe proportion of students with a positive attitude towards new media technology teaching mode84%-Percentage of students who believe that new media technologies provide more learning opportunities and resources78%-The proportion of students who think the new media technology teaching model is attractive and actionable78%-The proportion of students who think the new media technology teaching model enhances practical skills83%-Percentage of students who believe that the new media technology teaching model has a positive impact on learning outcomes79%-Percentage of students who think teachers need to better master and use new media technologies	72%Students' Acceptance Degree and FeedbackThe proportion of students with a positive attitude towards new media technology teaching mode84%-Percentage of students who believe that new media technologies provide more learning opportunities and resources78%-The proportion of students who think the new media technology teaching model is attractive and actionable78%-The proportion of students who think the new media technology teaching model enhances practical skills83%-Percentage of students who believe that the new media technology teaching model has a positive impact on learning outcomes79%-Percentage of students who think teachers need to better master and use new media technologies
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	think the new media technology teaching model is attractive and actionable78 %-The proportion of students who think the new media technology teaching model enhances practical skills83%-Percentage of students who believe that the new media technology teaching model has a positive impact on learning outcomes79 %-Percentage of students who think teachers need to better master and use new media technologies	think the new media technology teaching model enhances practical skills83%-Percentage of students who believe that the new media technology teaching model has a positive impact on learning outcomes79 %-Percentage of students who think teachers need to better master and use new media technologies	think the new media technology teaching model enhances practical skills83%-Percentage of students who believe that the new media technology teaching model has a positive impact on learning outcomes79 %-Percentage of students who think teachers need to better master and use new media technologies
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The new media technology teaching model has also achieved a positive impact from the perspective of students' interest and engagement in learning. In the survey, 69% of the students indicated that they were interested in the new media technology teaching mode, while only 47% expressed interest in the traditional teaching method. In terms of student engagement, students who used the new media technology teaching mode participated more actively in class discussions and hands-on practice. In classroom discussions, the average number of questions asked by students using the new media technology teaching mode was 5.2, while the average number of questions asked by students using the traditional teaching mode was 3.8. In hands-on practice, the participation of students using the new media technology teaching mode was 87%, while the participation of students in traditional teaching methods was 72%.

In terms of student acceptance and feedback. In the survey, 84% of the students had a positive attitude toward the new media technology teaching mode. They think that new media technology provides more opportunities and resources for learning.78% of the students think that new media technology teaching mode is more attractive and maneuverable. They like to learn through multimedia resources, virtual experiments, and simulation software, etc. 83% of the students indicated that the new media technology teaching mode enhanced their practical skills. Virtual experiments and simulation software enabled students to perform experiments in a safe and unrestricted environment, which enhanced their practical skills and experimental design abilities.79% of the students felt that the new media technology teaching mode had a positive impact on their learning outcomes. They felt that it was easier for them to grasp and apply their chemistry knowledge through the interactive teaching methods and rich learning resources.68% of the students felt that teachers needed to better grasp and utilize new media technologies to support teaching.73% of the students made suggestions for providing richer learning resources. They would like to have access to more tools such as multimedia resources, online teaching platforms, and laboratory simulation software to learn chemistry more comprehensively.

As can be seen, there are still some challenges in the application of new media technologies in teaching chemistry at the higher vocational level. For example, the support of technical equipment and software requires the investment of appropriate resources; teachers need professional training and instructional design in order to fully utilize the advantages of new media technologies; and there are differences in students' acceptance of technology and ability to use it, which requires the provision of individualized support and guidance.

3.3 The Practical Suggestions

Strengthen teacher training and mentoring. Relevant training courses and resources should be provided. At the same time, teachers are encouraged to share their experiences and teaching resources with their peers in order to promote cooperation and learning among teachers. Teachers should have a comprehensive understanding and mastery of the application methods and tools of new media technologies, and integrate them into the design and implementation of teaching, such as class check-in software and interactive question-and-answer software. By selecting appropriate multimedia resources, virtual experiments, and simulation software, etc., teachers can create more attractive and interactive learning environments that stimulate students' interest in learning and promote their in-depth understanding and application of chemistry knowledge.

Improvement of educational facilities and technical support. The school provides advanced hardware and software tools to create a new model of an organic combination of laboratory+online teaching. At the same time, it establishes a specialized technical support team to solve the problems encountered by teachers and students in the process of use in a timely manner. This can ensure the smooth running of the teaching process and give full play to the positive impact of new media technology in education.

Encourage research and innovation. Provide support and incentives for teachers and researchers to encourage them to carry out research and innovation in the application of new media technology in higher vocational chemistry teaching. Schools can set up special research projects and funds to support teachers and researchers to conduct in-depth studies on new media technologies in teaching chemistry in higher vocational education and to promote development and innovation in this field.

Provide rich learning resources. Establish a unified platform or database to integrate various chemistry learning resources, including videos, simulation experiments, online courses, etc., so that they can be used by students for independent learning and by teachers for lesson preparation. At the same time, encourage teachers to share the teaching resources they have developed and form a good resource-sharing mechanism.

Strengthen students' technical skills training. Provide students with the necessary technical training to help them master the basic operation and use of new media technology. In addition, students are encouraged to participate in the design and implementation process in the teaching of new media technology to cultivate their innovative thinking and practical ability. Collective discussion forums are set up through network software so that students can actively participate in the learning life in the process of brainstorming, and make use of the innovative thinking of different students to actively optimize their own learning methods.

Promote cooperative learning and practice. Utilize new media technologies to promote collaborative learning and practice activities among students. For example, through online collaboration tools and virtual labs, students can work together to research and solve chemistry problems, conduct simulation experiments, and share each other's findings and experiences. Such collaborative learning and practice can enhance students' teamwork, communication, and problem-solving skills.

4. CONCLUSIONS

This paper explores new media technology in the teaching of chemistry at the higher vocational level and finds that it has great potential for improving the quality of education. The findings show that the application of new media technology can stimulate students' learning interest and increase their participation, which positively affects the understanding and mastery of chemistry knowledge in higher vocational education. Students' high acceptance of the new media technology teaching model provides an opportunity to promote and apply the model. The final conclusion shows that the rational use of new media technology can enhance the effect and quality of higher vocational chemistry teaching, stimulate students' learning motivation and promote the development of higher vocational chemistry education.

However, we should also recognize that the application of new media technology is not a once-and-for-all solution, but requires continuous innovation and optimization. Teachers need to continuously learn and master new technologies to ensure their correct integration into the teaching process. At the same time, they need to pay attention to the design of teaching content and teaching methods and combine new media technologies with other effective teaching strategies to achieve better teaching results.

In addition, the government and schools should give sufficient support and investment to provide teachers with appropriate training and technical support in order to promote the wide application of new media technologies in higher vocational chemistry teaching. At the same time, a good monitoring and evaluation mechanism should be established to identify and solve the problems in the application of new media technologies in a timely manner and evaluate their effects to further improve and optimize the teaching mode.

In conclusion, new media technology brings many opportunities for higher vocational chemistry teaching, but we also need to be fully aware of its limitations and challenges and strive to seek innovation and optimization in order to continuously improve the quality and effectiveness of higher vocational chemistry education. It is hoped that this study can provide a reference and reference for higher vocational chemistry education and promote the innovation and development of teaching mode.

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