US-China Education Review A, November 2024, Vol. 14, No. 11, 733-737
doi: 10.17265/2161-623X/2024.11.005

Research on Chemistry History Teaching Methods Using Creative Information Technology Integration

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In the current period of rapid information technology development, additional methods for incorporating history, culture, and life phenomena into chemistry instruction have gained creative directions and challenges due to the ongoing advancements in education and teaching reform. With the rapid advancement of society, continuous innovation in information technology has emerged as the most viable option for a wide range of instructional techniques. As a result, there is a growing demand to incorporate artificial intelligence, information technology, and other cutting-edge technologies into classroom instruction. In response to the comprehensive promotion of information technology and education and teaching integration of the call for innovation and development, this paper aims to follow the trend of information technology development, the background of the ongoing reform of education and teaching, investigate the use of information technology in the application of the history of chemistry more appropriately integrated into chemistry teaching, and enhance the efficacy of contextual learning.

Keywords: information technology, chemistry history, converged application, teaching strategy

Introduction

The grand plan of education, which forms the basis of Building a Great Country and Rejuvenating the Nation, is also undergoing constant revision in the current period of ongoing information technology innovation and reform. As a fundamental, conventional natural science, chemistry has intimate ties to many other fields and can also branch out into new fields with physics, biology, medicine, and other fields (Ayllón et al., 2018). Yet both chemistry itself and the cross-cutting disciplines need teaching styles that yield more effective classrooms, and since education continues to change in response to the rapid advancement of knowledge, educators are actively looking for new pedagogical approaches.

Acknowledgement: This research is supported by the Natural Science Foundation of Shanghai (22ZR1444200).
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All kinds of educational programs have long included contextual teaching (Stansberry, 2017). At first, the majority of contextual introductions used words to set the atmosphere before including thinking and imagination. In the information age, this teaching method has been improved and innovated due to the addition of various digital devices, from the initial introduction of electronic screen blackboards to the application of electronic courseware in classroom teaching and other means in the implementation of educational reforms to enhance the capacity of students to draw knowledge. The output of knowledge points in micro settings is more difficult to understand because of greater abstraction, and students are more likely to absorb chemistry subject information from a macro perspective. In order to refine the chemical system for today's learning applications, we can thus rely on the history of chemistry to establish new contexts. This includes first learning about the experimental discovery process of scientists in earlier eras, followed by the discovery of new and more theoretical chemical knowledge with new perceptions. With the advancement of information technology, digital equipment has gradually expanded beyond electronic whiteboards to include a range of drawing software, animated video production, 3D projection, and other tools. This has improved the classroom's atmosphere and the depth of its content.

Advantages of Integrating the Teaching of Information Technology and the History of Chemistry

Improving the Quality of Education and Teaching

Currently, the incorporation of information technology into classroom instruction has created a remarkable accomplishment in raising the standard of education and learning (Deng, 2022). The development of innovative teaching strategies and educational models, the optimization of educational resources, and the creation of digital learning environments are all necessary to implement education reform comprehensively. However, integrating different information technologies into chemistry and history instruction not only increases students' openness to learning but also contributes significantly to the modernization of education in terms of student-teacher relationships, learning interest, and learning energy concentration. This modernization of education is driven by education informatization. The romance of chalk, a blackboard, and a book has faded, and the rapid advancement of the times has also compelled education reform strategies to be continuously improved, offering a fresh viewpoint on the thorough integration of information technology and educational instruction.

Enhanced Knowledge Penetration

An understanding of the history of chemistry is important to the degree of mastery of the subject. The same sort of copper ox lamps from the Han Dynasty, "twin" feather design copper phoenix lamps, Song Dynasty "oil-saving lamps" as teaching examples, and so on. He is constructed as a straightforward unclosed concave container, with a hollow sandwich that fills with water and fits together as a whole entering through the unclosed aperture and the concave portion holding fuel. It involves the energy transformation of fuel combustion and the specific heat capacity property of water chemistry. The loss of oil is first introduced by converting the chemical energy of fuel combustion into internal energy, which raises the oil's temperature until it reaches its boiling point and volatilizes from a liquid to a gas. Second, when absorbing the same amount of energy, the temperature change of water is negligible because of its high specific heat capacity. Water is therefore essential for absorbing additional energy in the interlayer. In order to minimize fuel evaporation, we simultaneously inject cold water into the jacket

to cool it down. At last, the sandwich's water is heated and turns into water vapor that escapes upward from the water injection port. This allows the wick flame to be precisely constrained for brighter, more focused lighting. It is easier to explain this chemistry experiment, but it is challenging to predict how well students will understand it. Information technology integration will significantly increase the penetration of the chemistry knowledge mentioned above. A brief method to acquire the main concepts is by viewing movies or using an audio-visual combination. Alternatively, the application of mapping software by teaching practitioners to map out the experimental process in steps is a great enhancement to promote the innovation of classroom teaching models, as well as a challenge for teaching practitioners to learn emerging technologies.

Challenges of Integrating the Teaching of Information Technology and the History of Chemistry

Insufficient Reserve of Chemical History

As an essential part of the discipline's substance, chemistry history is frequently disregarded, but it deserves greater attention as a means of comprehending the evolution of chemistry. Combining the history of chemistry with knowledge not only increases students' receptivity to knowledge but is also crucial for the development of scientific thinking and methodology. Learning later in life is like walking on the shoulders of giants, and it is human nature to learn by imitation. The history of chemistry introduced in the current chemistry textbooks is rather brief, and its lack of depth and breadth is another significant factor influencing the way chemical knowledge is taught. Most students are taught the history of chemistry in the classroom because it is part of the exam; however, the rest of the relevant history of chemistry has not been included in the content of the teaching of the educators, which has a significant impact on students' understanding of the penetration of the overall level.

Substandard Information Technology Skills

From the high demand for teachers of information technology subjects to the mastery of basic operations and proficiency in using media tools by teachers of various subjects, the way that information technology and chemistry history are taught has changed in the current era of continuous innovation in information technology. Since educators vary in age and experience, as well as in their level of proficiency with media technologies, it is impossible to ensure teaching effectiveness to a significant degree. In order to ensure that the teaching and learning process runs smoothly, the education information management system has to be planned in a coordinated way, the capacity of the education public service must be increased, and professional maintenance is required for the updating and guaranteeing of basic education teaching equipment.

Lack of Integration of Information Technology With the History of Chemistry

A strong foundation for the modernization of education is provided by the close integration of teaching and information technology. The actual effect of information technology instruction is diminished by simple superposition, mechanical application, and superficial application (Yu, 2012). In order to fulfill the fundamental teaching requirements, the history of chemistry will be taught using simple language descriptions and picture observations. Chemical knowledge points will be broken down, and the history of chemistry will be taught through the use of a variety of new information technologies. The history of chemistry instructional design should be more innovative in how it integrates information technology, and the use of media tools to teach while engaging with students should be promptly modified and enhanced.

Keys to Integrating the Teaching of Information Technology and the History of Chemistry

Professional Competence Training

With the continuous innovation of the teaching mode, the way of teaching chemical knowledge is gradually diversified, requiring educators to explore new types of teaching methods (Lin, Yang, Jiang, & Li, 2023). Targeting understanding logic, fundamental concepts, professionalism, and educational abilities is made easier with the support of subject teaching skills training. Additional themes on the history of chemistry should be covered in the training content, along with a thorough examination of the subject matter through knowledge competitions, talks on the subject, AI animation simulations, and other formats. These methods strengthen students' understanding of chemistry's past, improve instruction and learning, foster students' curiosity and inventiveness, and allow for a wider variety of questioning styles by drawing on the rich historical background. In order to adapt to the digital age, disciplinary competence training combined with information technology is preferred. For instance, social media platforms, exchange groups, posting, microblogging, hypertext, etc., allow educators to play to their strengths in information complementation, and the educator's research on the history of chemistry can be shared to reduce the amount of time it takes to retrieve knowledge. Ensuring the holistic development of student learning is the main goal of disciplinary competency training, and core literacy development benefits from continuing and innovative professional development.

Information Technology Competency Training

The greatest goal of information technology education is to develop innovative abilities through education and contemporary information technology. In order for students to adapt to the rapidly changing life in the information age, educators need to change the teaching mode, through informationization and technology, to cultivate students' innovative thinking and ability, and to promote the equity of education and the quality of teaching. The limitations of modern information technology in education and teaching include the IT experience of the educators, the economic development of the region, and the driving force of the educators. Effective information technology training is conducive to the development of high-quality education, for instance, using instructional work software, video media software, 3D drawing software, and instructional system websites to teach and update in real-time. In order to attain equality and fairness in education, information technology equipment must be accompanied by infrastructure in certain locations due to economic backwardness. In addition to improving the teaching abilities of the faculty, these technical pieces of training allow them to actively reinvent their teaching methods, which increases the efficacy of chemistry instruction. High-end development is replacing infrastructure in the teaching of information. With increasingly sophisticated digital media tools that pique students' interest and imaginations, educators are more competitive.

Enhancing Technology Integration

New benefits in digital education have been made possible by the close integration of contemporary information technology with teaching and learning. In the change to modern education, traditional teaching methods should be broken down into information technology levels, identify the features of the chemical discipline, make clear the requirements of various school years, implement the new idea of in-depth integration, and be set up to foster a proper teaching philosophy. According to a fresh perspective on talent, educators should emphasize the value of instructional media software as a teaching and learning tool, for instance, incorporating

historical divisions of chemistry into chemical experiments, considering issues, posing queries, and resolving issues from a scientific perspective. Instead of using information technology to visualize the content and functioning of experiments, it encourages pupils to think creatively (Powers, 2020). Students can use media, such as audio and video software, to study the history of chemistry outside of the classroom. Learning also requires reinforcement outside of the classroom. The promotion of educational modernization should also steer clear of the forced incorporation of information technology, and the use of multimedia teaching aids, drawing software, and other resources should be consistent with scientific teaching practices. In addition to elucidating the topic of usage, the thorough integration of information and communication technologies into education should foster the general growth of student literacy from supporting instruction to supporting learning.

Conclusion

There will inevitably be a struggle to fully integrate information technology into the teaching of chemistry history. The groundwork for the modernization of education has been established by the development of an environment focused on information education, the breakthrough in the notion of education and teaching, and the thorough integration of information technology and chemistry classroom instruction. The development of the new situation necessitates that educators overcome difficulties and consider all options, even though there are still issues like inadequate knowledge reserves, inadequate information technology skills, and a lack of thorough technology integration in practical application. Teaching the history of chemistry and information technology together is only a cartography of updated education. In the dilemma problem of hard memorizing fragmented chemical points, comprehension of scientific rigor, cultural affiliation with the subject of chemistry, and the stimulation of students' potential, deep integration as a fundamental objective is crucial.

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