



The Construction of Middle School Chemistry Efficient Classrooms Under the Background of New Curriculum Reform in China

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ABSTRACT

From 1949 to the present, China's basic education has undergone eight curriculum reforms. The "Outline of China's Education Reform and Development" issued in June 1994 clearly put forward the concept of quality education, and "quality education" has become the main theme of curriculum reform. In 2022, a new round of curriculum reform vigorously implemented the policy of "core literacy" and comprehensively cultivating high-quality talents. Quality education and high-efficiency classroom teaching research to comprehensively promote core literacy education have been paid more and more attention by the majority of researchers. The revised two-dimensional framework of the theory of Bloom's classification of educational objectives is helpful to build an efficient classroom and cultivate students' high-level thinking. In combination with the teaching practice under the background of basic education reform, this study discusses the construction methods and strategies of high-efficiency chemistry classroom in Middle School under the theory of Bloom's classification of educational objectives.

Keywords: Basic education; Curriculum reform; Efficient classroom; Bloom's classification theory of educational objectives

THE COURSE OF CHINA'S BASIC EDUCATION CURRICULUM REFORM

Since the reform and opening up in 1978, Chinese middle school chemistry teaching has experienced several reforms and achieved remarkable progress. However, due to the impact of the examination education, the "command stick" of the college entrance examination has still fallen on the level of the knowledge of students, which leads to Full of "cramming education" and "spoon-feed" teaching mode abound. Knowledge-based classroom model has led to a decline in the interest of students' learning chemistry. Students are unwilling to listen, and the efficiency of classroom efficiency has decreased obviously. The effective strategy of changing the current situation of teaching is to build high-efficiency classrooms, and transform

the course implementation in curriculum reform from "make students learn" to "students want to learn", improve students' interest in learning and develop students' core literacy of disciplines^[1], so as to cultivate innovative talents needed by the country to accelerate the process of high-quality development of basic education in China.

The course carries educational ideas, educational goals and educational content, and determines the quality of talent training, indicating the future of the nation and the country^[2]. And the course is also the main carrier of talent training, which is an effective way to improve the quality of talent training^[3]^[4]. Since 1949, China has carried out eight primary and secondary school curriculum reforms. These eight curriculum reforms have laid the "people-oriented" educational tone and promoted the transition process from "three-dimensional" to "core literacy". The formulation of patterns is becoming more and more rational. "The key events of social development and the main nodes of educational reform have an important impact on the launch and progress of basic education curriculum reform."^[5] Combined with the process of social development and the relevant reform documents promulgated by the state, the reform of China's basic education curriculum can be divided into four aspects: preliminary reform, independent exploration, adjustment and consolidation, and deepening reform.

Preliminary reform stage (1949-1957)

At the beginning of the founding of the People's Republic of China, domestic education still had strong feudalism and capitalism. In August 1950, the Ministry of Education published the "Interim Standards for Curriculum (Draft) of Elementary Schools (Draft)" and "Interim Teaching Plan for Middle Schools (Draft)". It is mainly based on subsection courses; In September 1955, the Ministry of Education's "Instructions on Implementation of Primary School Teaching Plan" provided strong institutional support for the implementation of frequent changes in teaching plans. The curriculum reform at this stage formulated a unified educational idea, and the new curriculum. Also, it reinforced the political and ideological education of primary and secondary school students.

During the independent exploration stage (1958-1976)

In 1958, China's basic education course reform embarked on the road of self-exploring. In terms of curriculum settings, the "Instructions on Education Work" promulgated in China in September 1958 set up labor education to formal courses; in terms of curriculum management, in 1963, the Ministry of Education proposed that the state should implement unified management of basic education curriculum.

Adjustment and consolidation stage (1977-2000)

In 1978, the Ministry of Education adopted the "Draft Full-time Ten-Year Primary and Middle School Teaching Plan", which proposed the teaching of "dual-foundation theory" that attaches importance to basic knowledge and basic skills. In 1981, the Ministry of Education formulated the "Full-time Five-Year Primary School Teaching Plan (Revised Draft)" and "Full-time Key Middle School Teaching Plan (Trial Draft)". The measures in the two drafts can make primary and secondary school education in line with social development trends and meet the needs of the times. At the same time, they enable students to develop in many aspects of morality, intellectual and physical, and strive to become a newcomer with ideals, morality, culture, and discipline.

In 1988 and 1992, the State promulgated the "Compulsory Education Full-time Primary School, Junior Middle School Teaching Plan (trial draft)" and "Nine-year Compulsory Education Full-time Primary School and Junior Middle School Curriculum (Trial)" to ensure the smooth implementation of curriculum and teaching during compulsory education. The curriculum reform at this stage has re-established the "dual-base" curriculum orientation, and China's basic education has also changed from the three-level course system of "primary school-junior high school-ordinary high school" to "compulsory education-ordinary high school" two-level curriculum system.

Deepening the reform stage (2001-to this day)

In 2001, the State Council passed the "Decision on the Reform and Development of Basic Education" and the "Outline of the Reform of the Basic Education Curriculum (Trial)", which set off a new round of basic education curriculum reform. It has greatly innovated from various aspects such as value orientation, theoretical foundation, curriculum management, curriculum settings, curriculum content, curriculum implementation, curriculum evaluation, etc. In September 2016, China officially established the overall framework and basic connotation of Chinese students' development core literacy. This is another major reform of the course goals after the "dual-base". In 2019, the Ministry of Education newly released the "Opinions on Deepening Education and Teaching Reform to Comprehensively Improve the Quality of Compulsory Education", and put forward the reform strategy of adhering to the "five education" and comprehensively implementing quality education. The deepening-in course reform has revised the original curriculum system to a certain degree, and the core literacy concept has begun to be widely implemented.

Efficient classroom construction in the context of curriculum reform

In 2021, under the guidance of Jinping Xi's new era of socialism with Chinese characteristics in the new era of Jinping Xi. The basic education in China is committed to cultivate the newcomer of the era of cultivating the rejuvenation of the people is the responsibility., and the quality of development was placed in a more prominent position, focusing on improving the quality and efficiency of development, and building construction. High-quality basic education system has made major breakthroughs in promoting high-quality development ^[6].

REQUIREMENTS FOR THE CURRICULUM REFORM

The basic education course stipulates the educational goals and educational content, which should play the important role in morality education. When the revision of the previous curriculum reforms meets the goal of cultivating students' lifelong development, it also meets the requirements of political requirements. The new round of curriculum reform requires strengthening the quality education of students, cultivating students' ability to explore, cooperation and communication, and gradually enhance the core literacy of students' chemical disciplines. If you want to comprehensively improve the overall teaching quality, you must improve the teaching quality of each lesson. As a result, the idea of "high efficiency classroom" has been widely implemented, and its construction has strengthened the core literacy of students' disciplines, which is very in line with the goal of educating people in new curriculum reform. To be specific, what are the efficient classrooms? Efficient classrooms are different from traditional classrooms. It is a new way of teaching. High-efficiency, as the name suggests, investing in the least time and energy, to achieve the best results, efficiency and effectiveness are the dual characteristics of an efficient classroom, and neither can be called a

real efficient classroom. In the actual teaching process, attention should be paid to the efficiency and effectiveness of the classroom.

THE THEORETICAL FOUNDATION OF BUILDING AN EFFICIENT CLASSROOM

In 1956, the officially published "Book of Educational Objective Classification: The Field of Cognitive" became the iconic achievement of the classification of educational goals. It has produced an important role in formulating the formulation of educational goals in the United States, curriculum settings, and the development of educational evaluation^[7-11]. At first, the theory of target classification was used in the primary education stage, and then expanded to the field of higher education. In 2001, Anderson revised the classification of education goals. The core of the revision is to improve and deepen the original one-dimensional "cognitive field" from the knowledge and cognitive dimension. The reconstruction of the two-dimensional framework has become an effective tool framework for research, learning, and evaluation.

After research by many scholars from various countries, it is found that the revised version of Bloom's educational goal classification theory is very helpful for cultivating higher-order thinking and constructing efficient classrooms^[12-19]. This taxonomy divides the cognitive process dimension into six categories: memory/recall, comprehension, application, analysis, evaluation, and creation, and this dimension describes the expected cognitive process. Dividing the knowledge dimension into four categories: factual knowledge, conceptual knowledge, procedural knowledge, and meta-cognitive knowledge, this dimension describes the level of knowledge that students are expected to master or construct.

The two-dimensional framework has two characteristics: 1. It is measurable. It can be used to analyze the objectives of a unit or syllabus, to provide a concise analysis of the objectives according to the table, and to detect the progress of the students towards the completion of the objectives. At the same time, it is very helpful for the research of course orientation and helps teachers to distinguish teaching activities and teaching objectives. 2. Has a hierarchical structure. It can concretize the abstract teaching content and divide the cognitive dimension from low to high. At the same time, it can provide the teaching design with a scientific theoretical framework for different knowledge types and cognitive levels, so that teachers can design activities. In addition, it is possible to apply this theory to consciously judge whether the design of teaching activities is reasonable, whether it has trained students' cognitive thinking at all levels, and whether it is gradual from low level to high level.

HOW TO BUILD AN EFFICIENT CLASSROOM

Generally speaking, efficient classroom teaching can be reflected in the following two aspects: First, maximize classroom efficiency. This aspect mainly refers to that students can gain more knowledge in a certain period of time. Second, maximize classroom effectiveness. This aspect mainly refers to the degree to which students are positively influenced by teaching and education. It is usually manifested in the aspects of thinking ability, learning ability, habit formation and interest cultivation ^[20].

Use a two-dimensional framework to determine teaching objectives

Middle school chemistry has the characteristics of wide knowledge coverage, complex knowledge networks and abstract chemical equations. For middle school students, if they do not have a deep understanding of the knowledge points, it is difficult for them to master the

method of learning chemistry, resulting in the failure to improve their grades. The target classification table gradually advances the thinking process from the low level to the high level in the cognitive dimension, which not only conforms to the development process of students' cognition, but also helps to improve students' interest in chemistry learning. Using this classification can help teachers more accurately grasp the classroom teaching target, also can use the theory to analyze teaching plans, to better clear lesson plan involved in teaching activities, the implementation of teaching evaluation and formulation of the degree of consistency between the teaching goal, thus more correctly to the teaching and assessment of the target, to improve the maneuverability of the teaching goal..

In the actual teaching process, teachers divide gerunds according to the teaching objectives. For example, when explaining the simple and easy-to-understand knowledge of metal elements, non-metallic elements and their compounds, they first divide them according to the knowledge dimension. This content belongs to factual knowledge, and then according to Curriculum standards the teachers can decide which level the students are supposed to achieve. If students need to remember the content of these knowledge points and do not need to expand, then students only need to keep this part of the content in their memory, so that students can recite this part of the knowledge to achieve the teaching goal. For example, when students are required to apply the principle of primary batteries to solve problems, teachers should first clarify that the content requires students to transfer knowledge to achieve the application level of the cognitive dimension. And then the teaching method of this course can be explained by applying conceptual knowledge to teach. This requires teachers to have a thorough understanding of basic knowledge and two-dimensional theory. The more thoroughly the teacher understands, the more you can understand the level of the course goal setting, so as to better carry out teaching activities ^[21]. In actual teaching, teachers can carry out design activities according to the two-dimensional framework from preparing to giving. For teachers' teaching process is more layered, students will be easier to learn, and their interest in learning will gradually improve. As a result teaching will be more in line with students-based teaching philosophy and the optimization of benefits.

Use the two-dimensional framework to evaluate the test questions

The classification of Bloom's taxonomy of educational objectives can also be used as an evaluation method, which measures the content and level of the test target of the test questions from the two dimensions of knowledge and cognitive process. Some scholars at home and abroad use the revised version of the Bloom's taxonomy of educational objectives to conduct quantitative and qualitative analysis of the college entrance examination questions or textbooks, and obtain two conclusions: 1. Let educators deeply recognize knowledge and recognition There is an inseparable relationship between the two. In the actual teaching process, both teachers and students must understand that the process of knowledge and cognitive process is not the two processes of independence. Their intersection point is the specific types of knowledge that students should master and the cognitive level they should reach. 2. It can guide educators to take the initiative to examine the goals from the perspective of the student. In the face of a specific problem situation, students want to effectively solve the problem, what type of knowledge should be possessed, and what kind of cognitive level should be achieved in the type of knowledge ^[22] ^[23]. Foreign scholars believe that the theory of this classification can also provide students with a learning framework. They can raise a higher level of understanding to improve learning skills and test results ^[24]. Only by examining the goals

from the perspective of the student can we better understand where the students' confusion is, and teachers can better teach design.

In the actual teaching process in the past, many educators did not combine knowledge and cognitive process well, or when dealing with specific problems, they did not know what type of knowledge students should have and what kind of knowledge they should achieve. This will lead to students not being able to acquire knowledge well. The students' understanding would be ambiguous. Continuous failing to reach the low-level cognitive level can make the high-level dimensional goals even more unreachable. The high-efficiency classroom constructed based on this classification theory can well divide the target knowledge points. The classification of the horizontal and vertical axes of the two-dimensional classification table is from simple to complex, and the difficulty is deepened layer by layer. Teachers can use step by step teaching methods. Whether it is the previous test-oriented education or the current quality education, examinations are indispensable in the teaching process. Teachers adjust their own teaching progress according to the feedback of students' examination information, and conduct detailed analysis of the knowledge points in the test papers that are easy to lose points. In order to better determine the focus of future teaching, Bloom's two-dimensional classification framework can well analyze the test questions. Therefore, both from the perspective of teachers and students, the efficiency in the classroom has been improved to a certain extent.

CONCLUSION

In social and economic development, education always plays the role of "third power": it neither generates economic benefits nor directly promoting social development, but slowly realizes its own potential value by "changing people's quality". The focus of the new round of education reform is to put the "core literacy". The core literacy boom in the world is essentially the improvement of the quality of education. The overall improvement of the national core literacy can enhance the core competitiveness of the country. In the future, in the actual teaching process, educational people need to work together to allow high-efficiency classrooms to better practice in the teaching process and cultivate more high-quality talents.

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