

Analysis and Enlightenment of American Ap Chemistry Curriculum Framework under International Background

Lian CHEN

Beijing New Oriental Foreign Language School At Yangzhou, Yangzhou, Jiangsu 225000, China

nubliss@126.com

Keywords: United states, Ap courses, Universities

Abstract: American “AP course for short” has entered China in various forms. At present, the American University Committee has set up AP examinations in 38 subjects in 23 disciplines. According to the survey, AP courses have been widely offered in more than 15,000 high schools in the United States. This trend will promote the better connection between high school education and university education, and provide a broader platform for students. According to a nationwide survey conducted by the American College Advisors Committee, American universities have generally regarded students' performance in AP examination as the basis to measure whether they are qualified for college study. After completing the course, senior high school students take AP exams, and if they get certain grades, they can also get university credits and reduce or exempt university courses. Many American school admissions will also use AP scores as a basis for students' ability to study at a university. It is applied in one's own daily teaching to comprehensively improve students' chemistry literacy from the aspect and point of knowledge. With the continuous deepening of two-way exchanges in international education, characteristic education and open education have gradually been recognized by the public, and more and more Chinese people have gone to the world and are shining in various countries. This article discusses and analyzes the framework of related college prerequisite courses such as its AP design plan in the United States.

1. Introduction

The 21st century is an era of unprecedented close exchange of talents, materials and information. American “AP course for short” has entered China in various forms. At present, the American University Committee has set up AP examinations in 38 subjects in 23 disciplines [1]. According to the survey, AP courses have been widely offered in more than 15,000 high schools in the United States [2]. Nearly 3600 universities in more than 40 countries have recognized AP credits as their admission reference standards, including Harvard, Yale, Oxford, Cambridge and other world-famous universities. This trend will promote a better connection between high school education and university education, and provide a broader platform for students [3]. It is more important to improve the comprehensive quality of students. The AP score has become an important admission basis for American universities. According to the survey conducted by the American college entrance advisory board in the United States, American universities have generally regarded

students' performance in the AP exam as the basis to measure whether they are competent for university study. AP examination results have become one of the most important factors for many universities to consider [4].

The prerequisite course project is a course project independently developed and vigorously promoted by the American College Entrance Examination Committee [5]. The main purpose is to provide opportunities for students with strong learning motivation and strong ability, so that they can study first-year courses in high school. After completing the course, senior high school students take AP exams, and if they get certain grades, they can also get university credits and reduce or exempt university courses [6]. Many American school admissions also take AP scores as the basis for students to be competent for university study. At present, the description of it in China is mostly introductory research, while the front-line chemistry teachers in the college entrance examination system are mostly in-depth on specific knowledge points, and can not directly extract the essence from AP teaching [7]. It can be used in daily teaching to improve students' chemical literacy from the aspects of knowledge. With the deepening of two-way international education exchanges, characteristic education and open education are gradually recognized by the public, and more and more Chinese people go to the world, glowing in various countries [8]. It is precisely because the AP score is one of the important admission criteria of many universities that more and more students choose AP, including many Chinese students who want to study abroad.

2. Comparison of Ap Chemistry and Chinese College Entrance Examination Chemistry

2.1 Similar Curriculum Orientation

Students who take AP Chemistry Examination are to obtain the entrance qualification and credits of higher education. Master the basic chemical experiment methods and skills, and understand the application of modern instruments in the study of material composition, structure and properties. Understand the general process of chemical experimental research, and initially form the ability to use chemical experiments to solve problems [9]. In the past, the contents of AP chemistry courses only had general topics, but no specific knowledge points. From this point of view, there is no doubt that there are similarities between AP course and Chinese college entrance examination. In the United States, the number of AP courses and the number of students have become an important index to evaluate the quality of a high school. But in fact, the logical connection in these data may not belong to causality, that is, it is not because students choose AP. So in University, graduation and even employment will show good results, it is undeniable that students with strong learning ability will have better performance [10]. Due to the strong predictive effect of AP courses and scores on students' academic achievement, American colleges and universities pay more and more attention to students' AP course learning in the process of enrollment, and AP test scores have become an important indicator of university talent selection.

2.2 Candidate Groups Are Different

Because Ap Chemistry Course Is Integrated With Some Elementary University Contents, The Course Contents Are Difficult. Therefore, Generally Only Students Who Have Spare Capacity In Learning Will Attend. According To Statistics, Less Than 1% Of Students In America Will Take This Course. The Ap Chemistry Curriculum Combines The Contents Of Junior High School And University. Compared With The Chemistry Curriculum Of Middle School In China, The Content Of Ap Chemistry Examination Is Deeper And Broader. For Example, The Phase Transformation And Solution Dependence Involved In The Course Are Beyond The Scope Of Chemistry In The College Entrance Examination Of China. The Ap Course, Which Aims At "Pursuing Excellence",

Is The Typical Representative Of The High-Quality Course Which Emphasizes The Personalized Development And Fully Develops The Students' Potential. The Specific Links Include The Formulation Of Examination Outline, Proposition, Fair Organization Examination, Evaluation Results And Sending, Data Analysis And Evaluation, Etc., Which Are Implemented Strictly In Accordance With The Theory And Standardized Rules And Regulations Of Educational Measurement To Ensure The Quality Of Proposition And Fairness Of Examination. This Is Especially True For Chinese Students, Which Requires Not Only A Solid Chemical Foundation, But Also A Certain English Base. The New Curriculum Content Also Points Out Which Knowledge Points No Longer Appear In The Examination Scope, Emphasizing The Ability Of Inquiry And Reasoning And Logical Thinking In Some Key Areas.³Ap Chemistry Course Analysis.

2.3 Curriculum Framework

In order to reflect the inherent unity of science and help students construct integrated conceptual cognition. Because of the pressure of enrollment rate, the school ends the required courses too early, so that students can enter the elective courses ahead of time. It completely goes against the requirement of “training students to develop in an all-round way” put forward by the curriculum standards, and cannot achieve the comprehensiveness and universality of students' knowledge acquisition. Many countries are trying to integrate the curriculum content through “common concept” or “core concept”. The AP Chemistry Curriculum Framework is also explained structurally. As shown in Figure 1.

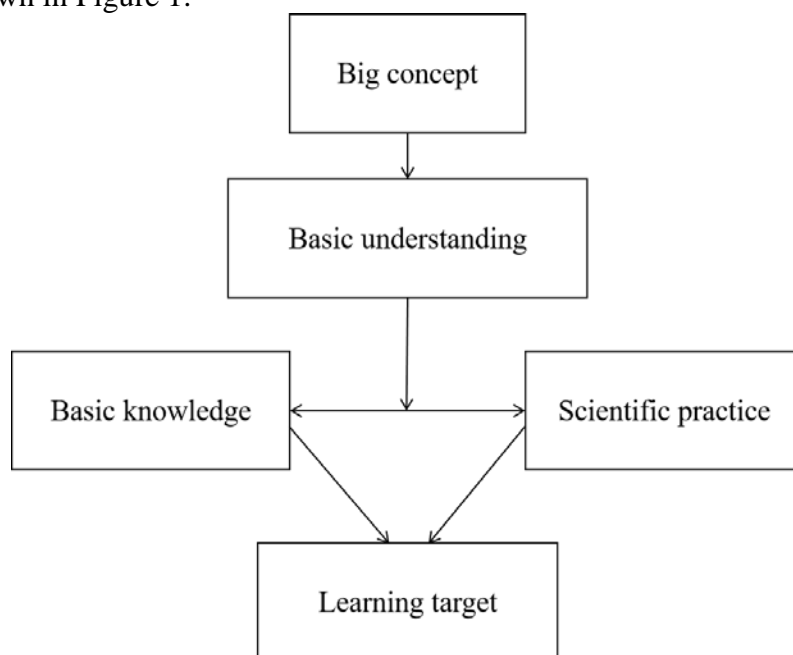


Fig.1 Ap Chemistry Course Framework

However, in the chemistry teaching of senior high schools in China, there is basically no possible classroom teaching time for such comprehensive experiments. Teachers mostly talk on paper in the form of exercises, and students will not have a more emotional understanding, and naturally they will not have a deep impression. The appearance of external conditions shows that the system is no longer a closed system, and some components of the system will change. We may learn from the evaluation method of AP examination, and change the score into grade. Candidates of a certain grade can choose the corresponding level of university according to their wishes, and then make two-way choices between candidates and schools. This kind of curriculum organization has been

widely recognized by scholars all over the world, and the revised AP Chemistry Curriculum is also a typical representative of this idea.

2.4 Big Concepts, Basic Understanding and Basic Knowledge

One of the most important changes in this revision of AP chemistry curriculum is that six “big concepts” of chemistry curriculum are put forward for the first time to integrate scattered knowledge points. As shown in fig. 2.

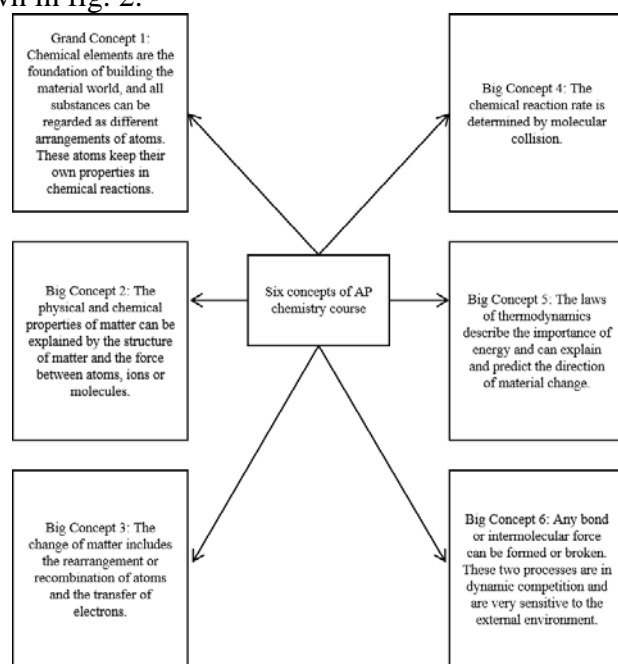


Fig.2 Six “Big Concepts” of Ap Chemistry Course

Since the college entrance examination is the baton of middle school teaching, the advantage of this method of implementation is to expose students to a broader knowledge system in the high school stage, but it also exposes a flaw. Form a pragmatic, rigorous and meticulous scientific attitude, with a critical and innovative spirit. Scientific practice is an important part of AP chemistry course, and it is also an important foundation for students to succeed in AP chemistry course. Seven scientific practices required by AP chemistry course. As shown in fig. 3.

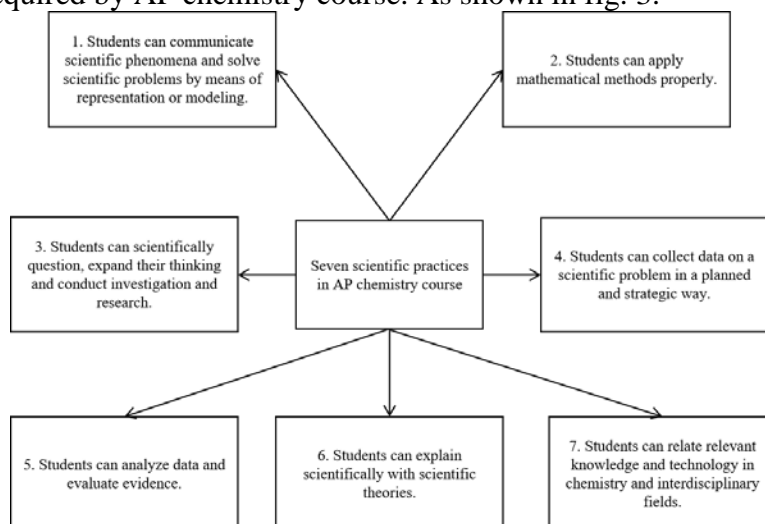


Fig.3 Seven Scientific Practices of Ap Chemistry Course

At the same time, it gives clear guidance to the concepts, contents and corresponding learning and examination skills required by the course. Therefore, in the process of implementing the curriculum of ordinary senior high schools, the biggest problem is the contradiction between the people's increasing educational needs and the shortage of higher education resources in China. In the face of fierce academic competition and the pressure of entering a higher school, high school students inevitably fall into the state of learning based on scores, reducing the choice and cultivation of their own interests. At the same time, the examples provided by the course for scientific practice give teachers a variety of teaching materials to choose from, so that each learning goal can be implemented.

3. Conclusions

At present, as more and more high school students in China expect to study in American universities, AP teaching has entered many high school classrooms. It can be seen that there are many differences between AP Chemistry Examination and Chinese College Entrance Examination Chemistry. It is impossible to simply judge which exam is better, because both exams are rooted and developed in China, and the national conditions are different. Examination system, examination methods, examination contents and evaluation methods will be different. The concept and content setting of AP chemistry course is undoubtedly the embodiment of the current trend of science education reform, which is why many of these concepts have been absorbed and developed in this round of curriculum standard revision in China. AP has a wide range of chemical knowledge, high content and low difficulty, but it also has some shortcomings, such as lack of logic in teaching content arrangement, unclear key and difficult points. The logic of chemistry curriculum in senior high school is compact, which is very consistent with students' cognitive law of chemistry learning, and the key and difficult points are clear, and the context of knowledge is clear. But a lot of knowledge omits the derivation process, only has the direct conclusion, the knowledge structure is obviously not complete. For the students with other needs, we should carefully select the curriculum content in the student's nearest development area under the concept of integrated development, and reasonably transform the curriculum.

References

- [1] Fang Yuanyuan, Wang Lei. *Analysis and Enlightenment of American AP Chemistry Course Framework*. *Chemistry Teaching*, vol. 000, no. 004, pp. 93-97, 2019.
- [2] Zhu Shaoxiang, Lin Jianfen. *Observation and investigation of AP chemistry courses in American high schools*. *Education and Equipment Research*, no. 11, pp. 89-91, 2018.
- [3] Meng Haiyan, Wang Yan, Li Baoyu. *Development of Chinese high school chemistry experiments based on AP Chemistry Compilation Experiments in the United States*. *Chemistry Education*, no. 37, pp. 17-20, 2016.
- [4] Sun Meiqin, Wang Danlei, Han Yaxiu. *Introduction to AP Chemistry Online Open Course Resources*. *Education and Equipment Research*, vol. 341, no. 12, pp. 93-97, 2020.
- [5] Fang Yuanyuan, Liu Kewen, Wu Jianjun, etc. *Pursuing excellence and stimulating potential-AP Chemistry Course "Electrolysis" Classroom Record and Evaluation*. *Chemistry Education (Chinese and English)*, vol. 38, no. 23, pp. 16-20, 2017.
- [6] Yin Biwen, Su Dong, Lu Guolin, Li Yang, Wu Jinghan. *The effect of AP/RDX/HMX on the rheological properties of GAP propellant slurry*. *Solid Rocket Technology*, vol. 200, no. 05, pp. 22- 28, 2020.
- [7] Wang Haiqing, Tang Zhina. *The characteristics and enlightenment of American AP calculus textbook compilation under the background of pre-university courses*. *Journal of Mathematics Education*, vol. 119, no. 02, pp. 78-81, 2018.
- [8] Jiang Shenlin, Jian Xin, Zhang Yang. *The enlightenment of American AP Physics 1 test questions on the preparation of Chinese academic level test questions*. *Middle School Physics*, no. 13, pp. 26-28, 2019.

- [9] Pan Rui, He Shuyin, Deng Min, et al. Guided inquiry teaching of chemistry concepts in AP courses in the United States-Taking “Chemical Equations” as an example. *Chemistry Education (Chinese and English)*, vol. 41, no. 11 , pp. 47-50, 2020.
- [10] Wan Xuejie, Guo Xiaode, Ouyang Gang. Application of low-temperature plasma technology to surface modification of ultrafine AP powder. *Energetic materials*, vol. 24, no. 01, pp. 79-84, 2016.