

# Course Selection Guide, Change Analysis and Development Trend Analysis of New College Entrance Examination Reform

Kexin Xu<sup>1</sup>

<sup>1</sup>School of English, Tianjin Foreign Studies University, Tianjin 300202, China

Email: xukexinLQ@outlook.com

**Keywords:** *new college entrance examination reform, course selection guide, change analysis, educational informatization, development tendency*

**ABSTRACT** This article first analyzes the reform in the new college entrance examination system, the overall changes in examinations and its potential impact. Secondly, it combines the first two batches of pilot reform data and places emphasis on the third batch of the latest "3+1+2" reform, focusing on the analysis of sub-subject selection, relevant changes, educational informatization and its application in education equity under the new policy. Then it explains the symbiotic development between high school and university education, and further analyzes the development tendency of China's education industry in the future.

## 1. INTRODUCTION

In September 2014, the State Council issued the "Implementation Opinions on Deepening the Reform of the Examination and Enrollment System". Since then, the new college entrance examination reforms with the goal of respecting students' right to choose autonomously and promoting students' individual development have taken the lead in Zhejiang and Shanghai.<sup>[1]</sup> With the advancement of reforms, Beijing, Tianjin, Shandong, and Hainan have become the second batch of pilots, indicating the upcoming nationwide reforms.

From the "3+3" model in the first batch of pilots to the "3+1+2" batch in the second batch, the change is aiming at consolidating the status of the history and physics subject, alleviating pressures of students and school teaching facilities and teachers' distribution brought by too many subject combinations and course selection.<sup>[2]</sup> However, this also reflects the shrinking phenomenon of science after the reform, especially the problem of decreasing people who choose physics.

In addition, in the transition process from the traditional college entrance examination model which was based on selective mode to the new examination model which is now symbiotic mode, the role of relevant changes in it cannot be ignored, because it is directly related to the structure optimization. At the same time, during the reform process, the rise of related derivative professions in the K12 education industry and the shift in the focus of training also reflect the change in the importance of subjects, and the systematic informatization and digitization in the teaching process also indicate a new path for it. This article will make an in-depth analysis of the above sections and the potential impact of the new reform on the education industry for academics, educational administration units and people from all walks of life.

## 2. NEW COLLEGE ENTRANCE EXAMINATION REFORM

### 2.1 Promotion Process: it is expected to complete the reform in all provinces in 2022

The initiation of the new reform was marked by the establishment of the first batch of pilots in Zhejiang and Shanghai.<sup>[3]</sup> Hereafter, the Ministry of Education added Beijing, Tianjin, Shandong, and Hainan as the second batch of pilots and implemented reforms in 2017. According to the earliest reform projects of provinces and cities, originally 18 provinces intended to put the reform into practice in 2018, but many provinces announced a one-year delay due to the problems in Central and Western Provinces, such as incomplete resource allocation, disproportion of subjects selected and imbalance in basic education's level in different regions.

In April 2019, Hebei, Liaoning, Jiangsu, Fujian, Hubei, Hunan, Guangdong, Chongqing initiated the comprehensive reform in the same period, becoming the third batch of pilots. The original fourth batch of pilots and the postponed third batch of pilots are expected to carry out the reform in 2022, at which time all provinces in the country will complete the reform.

## **2.2 Score Composition**

The State Council's reform document clearly states that students' total scores consist of a unified score of 3 subjects in Chinese, Mathematics, and Foreign Languages, and 3 subjects in the high school vocational level examination. The change is that foreign language subjects offer two examination opportunities, regardless of liberal arts and science. Students can independently choose among subjects according to the requirements of colleges and their specialty.<sup>[4]</sup>

## **2.3 Subject Selection**

The new reform breaks the solidified traditional arts and sciences branch and adopted a more scientific "3+3" model. For students, given them the right to choose more than 20 test subject combinations, they can give full play to their interests and strengths.<sup>[5]</sup> For high schools and universities, the reform has built a bridge between high school education and college education and strengthened the symbiotic link between the two sides. Colleges and universities can freely designate 1-3 compulsory subjects, which means that there is a high degree of correlation between the majors studied in high school and the undergraduate volunteer majors.

However, the problems gradually emerge during its implementation, such as the rarely selection of the physics discipline, the pressure on the allocation of teaching resources caused by the superabundant combination of disciplines, and the pressure on students' preparation for exams, which contribute to the transformation to "3+1+2" model. This change effectively elevated the status of physics and history, solved the problem of school assignment of teachers and classrooms, realized the burden reduction for students.

## **2.4 Scoring: cancel the subdividing evaluation level, and use the large level to assign scores in proportion**

Selective examinations all adopt a grading system that scores are delimited from the original grades first and then are converted into corresponding grade scores according to uniform rules. The provinces and cities in the first and second batches of reform pilots divide the students into five grades of A-E that each has five levels of refinement and give students different scores according to different assigned areas. In the third batch, the level of refinement is abolished, and only five major levels of A-E are adopted. Then the provinces and cities convert students' scores to different grade scores according to their respective proportional conversion rules.

## **3. Subject Selection Guide**

### **3.1 Subject Characteristics**

Physics, as one of the two compulsory subjects, has high learning difficulty, requires student's rigorous logical thinking and strong abstract thinking ability. As for Chemistry, there is less correlation between subject modules, which can be used as subjects for rapid mark-raising. Biology is a neutral subject, containing plentiful memorizing knowledge and scientific comprehensible knowledge for experimental design and inference.. History is considered the root of the liberal arts and not easy to get high scores. Politics examines student's ability to analyze current politics hot spots in combination with political principles, and its score is relatively stable. Geography is a neutral subject, which is suitable for students with strong science thinking, and college geography majors only recruit science students.

### **3.2 Dismantling One by One: a detailed analysis of 12-course selection combinations**

In order to maximize the college entrance examination scores and optimize career choices, students are supposed to follow the strategy of interest-oriented and professional-oriented courses selection,

comprehensively measuring the competitive pressure of each subject, and selecting subjects in terms of their advantages and subject characteristics.<sup>[6]</sup>

### *3.2.1 Select physics: wide coverage of majors and difficult to learn*

The advantage of physics discipline combination lies in the wide coverage of undergraduate majors. Students are capable of applying for more than 97% of the major in the university of science and engineering, but the learning difficulty is intensified.

Combinations of two science subjects and one arts subject: “physics, chemistry and politics” and “physics, politics and biology” — the proportion of majors that selecting these two categories can apply for are 98.9% and 99%. Learning politics is a convenient option for students who are calculated to take postgraduate entrance exams or civil servant exams in the future. However, it’s arduous to seize high scores despite its uncomplicated learning difficulty; “physics, biology and geography” and “physics, chemistry and geography” — the proportion can apply for are both above 99%.

Combination of two arts subjects and one science subject: “physics, politics and geography” — the proportion can apply for is 99%. It’s an excellent choice for biased students with preeminent physics and mathematics but inferior chemistry and biology. With undemanding learning difficulty and minor applicants, it can minimize students’ study pressure.

### *3.2.2 Select history: narrow coverage of majors and the overall difficulty is low*

The advantage of history disciplines combination is that the overall difficulty is relatively easy which leads to students’ less study pressure, but it possesses a lower major coverage.

Combination of full arts subject: “history, politics and geography”, the proportion of majors that selecting this category can apply for is 52.9%. Combinations of two arts subjects and one science subject: “history, chemistry and politics” and “history, biology and politics”, the proportion of majors can apply for are 88.6% and 75.30%. It’s suitable for students with outstanding advantages in chemistry or biology, and the number of applicants and the intensity of the competition are both moderate; “history, chemistry and geography” and “history, biology and geography”, the proportion can apply for are 87.60% and 77.80%. It has a medium majors coverage and learning difficulty, but there are a vast majority of applicants, therefore the competition is fierce.<sup>[7]</sup>

## **3.3 Professional Perspective: how to choose the major of "new engineering" and "new media"**

Since February 2017, the state has proposed the "Fudan Consensus", "Tianda Action" and "Beijing Guide", which constitute a "trilogy" for vigorously promoting the construction of new engineering disciplines. Its requirement of student’s cross-disciplinary knowledge acquisition and accumulation is also the main reform direction, proving that the encounter between the new engineering and the new Gaokao has become inevitable.

Physics has become the most crucial subject for new engineering discipline. For example, from the perspective of professional setting and curriculum arrangement, the Ministry of Education stipulates that 19 majors must take physics, accounting for 20.4% of the total majors, which includes 5 science majors, 13 engineering majors, 1 management majors. At the same time, the new engineering discipline has the basic characteristics of multidisciplinary integration, so students should have a solid knowledge base of disciplines, as well as the integrative elaborative faculty to combine course selection with aspiration.<sup>[8]</sup> For instance, Tsinghua University's Science Experiment Class and clinical medicine majors require to choose physics and chemistry.

## **4. Future Trend**

### **4.1 Chinese Training: the difficulty is improved and it becomes an important discipline to widen the gap**

Under the original examination model, the Chinese paper had indistinctive differentiation, therefore its importance had been ignored for a long time, which was far less noticeable than mathematics and English. Nevertheless, the importance of Chinese has unceasingly to raise under the new reform. Due to the addition of the number of English exams in many provinces which admit the highest

score as the final score and the dropping difficulty coefficient of mathematics paper under the new reform which breaks the boundary of science and arts, so the differentiation between English and mathematics has declined significantly.<sup>[9]</sup>

On the contrary, to enhance the ability of young people's native language level, patriotic fever and sense of identity, the Ministry of Education continuously enhances the difficulty of the Chinese paper, explicitly claiming the number of ancient prose to be memorized has increased from 14 to 72, making it a vital subject to expand score gap. As a result, the Chinese training industry also ushered in plentiful opportunities.

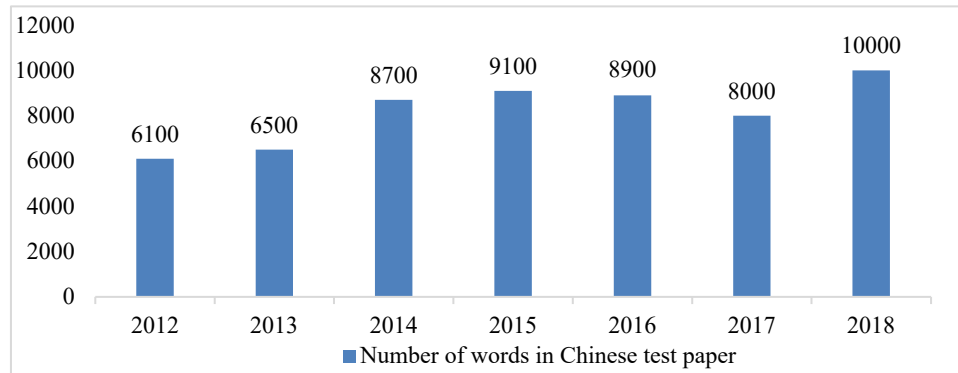


Figure 1 Changes in the number of words in Chinese test paper in the national college entrance examination from 2012 to 2018

Source: *China subject network*

#### 4.2 Class arrangement: the rise of "optional class system" - driving the rise of educational informatization

The optional class system and multiple subject combinations weakened the management of the original administrative class, causing its shift to the teaching class model, resulting in a more difficult and time-consuming class scheduling. High schools can utilize digital and informative management system to transform classroom organization, thereby improving management efficiency.

The rise of the "optional class system" has contributed to the rise of education informatization. The intelligent course scheduling system based on ICS and ASC can greatly reduce the difficulty and complexity of course scheduling and class placement. ICS is used for class scheduling, collecting subject data and classifying student's selection, level, and teacher's information by using the learning analysis function, and then it uses association rules to analyze and make schedules suitable for the current class assignment form; ASC is used for class placement, gathering data on the number of teachers and schedule rules and curriculum design through data collection function, and creates a preferable placement, relying on intelligent algorithms.

The rise of the "optional class system" also symbolizes the further strengthening of symbiotic links between high schools and universities. For example, the development of high-quality elective courses in high schools to avoid this phenomenon that sacrificing the hours of non-elected subjects to add the hours of elective courses, which is no different from the compulsory and optional elective system of universities. Following the example of university education, high schools establish a management system that combines administrative class and teaching class, master teacher system and tutorial system; Universities and high schools have both strengthened the construction of smart campuses, making full use of education informatization and big data technologies to realize the integration and intelligent mode of activities such as course selection, scheduling, management, and evaluation

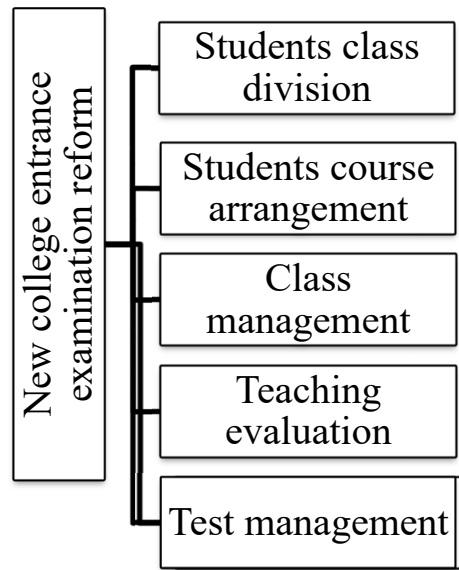


Figure 2 Demand of education informatization under the new college entrance examination policy

Source: Ministry of education, public information collection

Education informatization can also improve the uneven distribution of educational resources. Areas with rich teaching resources can provide high-quality teachers and teaching content for students in areas with insufficient teaching resources through online courses, such as the construction of national quality courses, one teacher and one excellent course, and large-scale MOOCs to achieve the fair sharing of educational resources and promote local education and economic development.

#### 4.3 Subject selection consultation: the independent course selection is diversified, and the evaluation needs of related specialties are derived

Under the new reform, the elective consultation that was mostly prepared for high-score candidates has gradually become widespread and earlier. Facing abundant subject combinations, most students begin to set up a subject selection policy in line with their learning characteristics and future career planning as early as the first year of high school or even junior high school, and the demand for consulting services derived therefrom increased year by year.

The demand for application guides and career counseling is also increasing.<sup>[10]</sup> Compared with students' or schools' relatively limited resources, education consulting service agencies can more comprehensively collect various professional information and judge specific subject's future development trend, fully considering factors such as economic returns, social needs, and candidate interests to provide students with more reasonable choose strategy, so the market has a broad prospect. At present, some online education companies have taken advantage of big data technology to provide students with comprehensive quality evaluation, career planning, guidance on the application of entrance examinations, highlighting personalized service.

## 5. Conclusion

In 2019, 8 provinces and cities launched the reform of the college entrance examination, and all provinces are expected to complete the reform in 2022. The new examination takes ideology and morals, science and culture, humanities, and social practice as essential evaluation indicators for comprehensive quality, aiming at establishing a diversified talent evaluation system as the development direction. Although it is impossible to implement it on a large scale in the short term, quality education has become a long-term rating trend. Under the new reform, in addition to the

scores for Chinese, Mathematics, and English are original scores, the selective examination adopts a grading system. The third batch of provinces canceled the subdivided evaluation grades and used large grades to assign scores in proportion.

The new Gaokao is a systematic reform of the entire college entrance system from high school to university, which reflects the continuous deepening of the symbiotic link between the two. After the reform, the degree of differentiation and importance of Chinese increased significantly, which drove the students' rigid demand for its training. The new reform has higher requirements for class scheduling and student management, which needs high schools to use digital and information management systems to solve problems. Besides, with the development of education informatization, the uneven distribution of educational resources across regions will be gradually improved. It's being developed that a new college entrance examination model system which integrates subsystems like career education, academic planning, subject selection, teaching in classified classes, mentoring management, and comprehensive quality evaluation. At the same time, leading companies in K12 extracurricular training, such as EDU and TAL, have initially applied technology based on big data analysis to provide students with college entrance examination consulting services, demonstrating a bright future of this industry.

## References

- [1] Li Tao. "Public Domain" of College Entrance Examination Reform[J]. Higher Education Development & Evaluation, 2013.
- [2] WANG Ai-fen, LEI Xiao. High School Career Planning Education and Approach to It in the Context of New College Entrance Examination Reform[J]. Theory & Practice of Education, 2018.
- [3] Zhang Jianglin, Director, associate research. Exploration and Practice on the Reform of the Setting of College Entrance Examination Will-Decision in Zhejiang Province[J]. Educational Research, 2007.
- [4] Winton H. Manning, Rex Jackson. College Entrance Examinations[M]. Springer US, 1984.
- [5] LI Xiongying, LENG Wenjun, SUN Yanchao. Comprehensive Evaluation:A New Orientation of the Reform of the College Entrance Examination[J]. Journal of Higher Education Management, 2016.
- [6] ZHOU Shiting, Shanghai Normal University. Culture Review on the Obstacles of Comprehensive Quality Evaluation Admitted into the College Entrance Examination[J]. China Examinations, 2018.
- [7] Yan F. Application of E-Portfolios in college students' comprehensive quality evaluation system[M]. 2013.
- [8] Ji Qingchun. Conception on the Practice of Subsuming Quantization of Comprehensive Quality Assessment into College Entrance Examination System[J]. Journal of Higher Education, 2018.
- [9] ZHONG Fang-cheng, GUO Yuan. Research and Practice on the Evaluation System of Students' Comprehensive Quality[J]. Journal of Higher Education Research, 2012.
- [10] Hong Zhizhong. Complexity of Education Institutional Reform: Viewing from a New College Entrance Examination Project of Beijing[J]. Education Research Monthly, 2014.