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Exploration of Teaching Mode Reform in Universities under the Background of "Four New" Construction

Guiju Nie

Anhui University, Hefei, China Email: 734189366@qq.com

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Abstract

According to the strategic development requirements of China's "Four New" construction and the new goal of talent training in Universities, education and teaching reform needs to be promoted urgently. In this paper, the basic connotation of the "Four New" construction is introduced, the new international education and teaching methods are mainly described, some problems existing in the implementation of higher education are analyzed, and the feasible ways of higher education reform under the new situation and the construction of new teaching resources in the new media era are discussed from the aspects of curriculum teaching content, teaching methods, teaching materials and curriculum evaluation.

Keywords

"Four New" Construction, Higher Education, New Teaching Method, Teaching Reform

1. Introduction

Since entering the 21st century, global economic competition has become more and more intense. With the acceleration of the process of building an innovative country in China, high education has made remarkable achievements. Meanwhile, it is also facing some problems that need to be discussed and solved, such as the orientation of higher education objectives, talent training mode in Colleges and universities, etc. To carry out the spirit of the National Conference on Undergraduate Education of Higher Education in the new era, the opinions of the ministry of education on deepening undergraduate education and teaching reform and comprehensively improving the quality of talent training, and other

series of education documents, and implement the results of teaching reform into curriculum construction and realize curriculum teaching innovation and coordinated development, all the universities in China are actively exploring excellent talent training modes in line with their own talent training ideas. Continuing to deepen the reform of education and teaching, based on the core element of talent training—curriculum, and taking the educational concept of "promoting the all-round development of students" as the guiding ideology, reconstruct the curriculum system and curriculum content, promote the reform and innovation of curriculum teaching methods and learning evaluation methods, and create inter-professional education (IPE), innovative curriculum group and innovative classroom integrating new engineering, new liberal arts and new medicine, innovate the talent training mode, so as to realize the comprehensive reform of education and teaching mode and improve the quality of talent training. Therefore, this paper discusses the reform and innovation of college curriculum teaching methods, teaching contents, teaching modes and teaching resources construction under the background of "new engineering, new medicine, new agriculture and new liberal arts", so as to promote the professional growth of teachers and promote the construction of curriculum infrastructure and quality improvement. Effectively integrate education and teaching mode, industry education integration, innovation and entrepreneurship, quality assurance mechanism and teaching management system, and jointly establish a talent training system in line with the "four new" construction mechanism and suitable for each university.

2. The Connotation of "Four New" Construction

To actively embrace the opportunities and challenges of the new scientific and technological revolution and industrial reform, 13 departments including the Ministry of education, the central political and Legal Commission and the Ministry of science and technology jointly launched the "six excellence and one top-notch" plan 2.0 in Tianjin on April 29, 2019, to comprehensively promote the construction of new engineering, new medical, new agricultural and New Liberal Arts (hereinafter referred to as "Four New") in order to improve the ability of colleges and universities to serve economic and social development, which will be fully carried out in three years (Website, 2019).

New engineering: it includes both new engineering major and new requirements of engineering. The construction of new engineering will meet the needs of the fourth industrial revolution and strengthen the cultivation of strategic talents. As an important foundation for building a healthy China, new medical should achieve full coverage from treatment-oriented to the whole life cycle and the whole process of health, and improve the health of the whole people.

New Medicine: As an important foundation for building a healthy China, it is important to realize the full coverage of the whole life cycle from treatment to health, and improve the health of the whole people. First, as a new ideas, it rea-

lizes the full coverage from treatment to the whole life cycle and the whole process of health; The second is the background. The new round of scientific and technological revolution and industrial transformation represented by artificial intelligence and big data complement each other: the third is the new specialty, the integration of medical engineering, science and literature, put forward new requirements for the original medical specialty, and develop new medical specialties such as precision medicine, translational medicine and intelligent medicine.

New Agriculture: By using modern biotechnology information technology, engineering technology and other modern science and technology to change the existing step agriculture major, accelerate the layout of new agriculture major. The new agricultural science will use modern science and technology to transform and upgrade agriculture-related majors and help build a beautiful China with blue sky, clean water, safe food and quiet life.

New Liberal Arts: The construction of new liberal arts is to promote the cross integration of philosophy and Social Sciences and the new scientific and technological revolution, cultivate philosophy and social scientists in the new era, and create a Chinese culture that shines in the era and the world. The new liberal arts should grasp the new requirements of the development of philosophy and Social Sciences in the new era, cultivate a new culture with Chinese characteristics, Chinese style and Chinese style in the new era, promote the cross integration of philosophy and social sciences with a new round of scientific and technological revolution and industrial change, and form a Chinese School of philosophy and social sciences.

The "Four New" construction should face the new development pattern, achieve high-quality development, strive to solve the theoretical and practical problems in the national socio-economic development, further explore the common scientific, technological and social problems faced by human development, strengthen goal orientation and problem orientation, use information technology to lead, promote the intersection of disciplines and the integration of science and technology industries, and constantly improve the scientific and technological content of serving the society. We should take the formulation of the "14th five year plan" as an opportunity to strengthen the adjustment of discipline and specialty structure, stimulate the enthusiasm of teachers to deepen practice, innovate theory and teaching reform, and promote the "four new" construction to reflect progressiveness in ideology (learning Chinese and western, integrating society), Technology (information technology, artificial intelligence) and results (innovation and talents). New engineering, new medicine and new agriculture are intertwined and supported by each other. The new liberal arts injects new elements into new medicine, new agriculture and new medicine. The "Four New" will be the forerunner, explorer and leader of the next round of higher education reform.

In terms of connotation, new engineering is the combination of new engi-

neering major, new requirements of engineering and deep cross with our major. New medicine is an important process for China to build the whole life cycle of health and treatment, and to improve the whole life cycle of health. New agricultural sciences should use modern science and technology to transform and upgrade agriculture related majors, and help build a beautiful China with blue sky, clean water, food safety and quiet life. New liberal arts is to promote the cross integration of philosophy and Social Sciences and the new scientific and technological revolution, cultivate philosophy and social scientists in the new era, and create a Chinese culture that shines in the era and the world. Therefore, the four new construction points out the way for the development of colleges and universities in China.

3. New Teaching Methods

Classroom teaching forms usually include: lecture, seminar, workshop practice class and tutorial tutorial class. Assessment forms include assignment, essay paper, presentation, and exam test. According to different teaching implementation environments and organizational forms, new teaching methods recognized as effective internationally include problem-based learning (PBL), case-based learning (CBL), team based learning (TBL), seminar and other new teaching methods. The specific organizational forms of various teaching methods are as follows.

3.1. Problem-Based Learning (PBL)

PBL is a teaching mode with "students" as the main body and "problems" as the guidance, also known as "problem teaching method", proposed by Professor Howard barrows of McMaster University School of medicine, McMaster University, Canada in the late 1960s. By creating problem situations, teachers promote the development of personality and the cultivation of innovation ability through the process of thinking, exploring and solving problems. The "problem oriented" teaching model was first applied in the field of medical education, and then gradually in the teaching of literature, mathematics, biology, chemistry, engineering and other disciplines. PBL emphasizes the "problem consciousness" in the teaching process and follows the basic teaching idea of "raising problems, analyzing problems and solving problems". From the perspective of students, teachers create problem situations, set questions, gradually guide students to explore and solve problems, build knowledge, constantly tap students' potential, and fully reflect the guiding role of teachers in the teaching process, which is conducive to stimulate learners' interest and cultivate their ability to think, solve and innovate (Dai & Ding, 2019; Tong et al., 2019; Sun et al., 2020).

3.2. Case-Based Learning (CBL)

CBL is an open and interactive new teaching method, which was first proposed by Christopher, former dean of Harvard Law School Columbus Prof. Langdell in 1870. After continuous promotion, it gradually spread rapidly from the United States to all over the world. Since the 1950s, case teaching method has been adopted by almost all majors in universities all over the world. Its focus is to cultivate students' ability to find, analyze and solve problems and the ability of teamwork. Until the 1980s, the case teaching method was officially spread to China's educational circles. At first, it was widely favored in the field of medical education, and then it was widely used in offline and online classroom teaching of economic management, science and engineering, and achieved good results. Case teaching method itself has the characteristics of innovation, motivation, interaction and authenticity. It plays an important role in stimulating students' learning enthusiasm, improving teaching effectiveness and promoting professional teaching reform (Yi et al., 2021; Yan, 2020; Tan, 2012).

3.3. Team-Based Learning (TBL)

Team (TBL) teaching mode is extended from the business team operation mode to classroom teaching. It was first applied in medical colleges and gradually applied to other disciplines. Nowadays, TBL has been widely accepted and adopted in European and American developed countries. TBL teaching mode is a teaching method based on team, which can promote students to use team resources for autonomous learning and cultivate students into lifelong learners. The team teaching model has achieved remarkable results in many fields and has also become a "cooperative learning" model. Teachers change "teaching" into "guidance". For a common learning goal, students form a team to jointly undertake learning tasks. They not only cooperate with each other, but also actively give play to the independence, autonomy and enthusiasm of each member. Through joint cooperative learning and problem-solving, they take the group's performance as the evaluation standard to jointly achieve the teaching goal. It can be seen that the teaching mode of team cooperation aims to cultivate students' team spirit, sense of public responsibility and comprehensive quality. Taking design courses as an example, in daily teaching activities, students can form a team of 3 - 5 people. Students divide their work according to the course content and tasks, or teachers assign roles according to the characteristics of students' interests, personality and ability. Team members build a good learning relationship through questioning, discussion and sharing, and collect, sort out and process information according to their roles and tasks, Finally, after joint discussion, we will complete PTT production and task report together. On the other hand, by forming a team of teachers and improving the teaching team of curriculum teaching, team teachers can update their professional knowledge in time, constantly improve the teaching objectives and teaching contents, and expand students' knowledge vision. Team teaching is more suitable for all kinds of events and discipline competitions. It can integrate their own teaching means, a variety of teaching methods, multi-disciplinary knowledge and a variety of teaching ideas to realize the comprehensive talent training mode, which is an important guarantee to

improve the quality of curriculum teaching (Mu et al., 2020, Liu, 2020a; Ren & Ren, 2019).

3.4. Seminar Teaching Method

Seminar translates from academic seminar, symposium, research seminar, etc. It originated in the normal school founded by German theologian A.H. Francke in the beginning of 18th century and was introduced into Gottingen University by the famous scholar J.M. Gesner. It was first used in philosophy teaching, and then in humanities, such as linguistics, law, economics, medicine, physics, etc It is also widely used in the teaching of social subjects and natural subjects. As a discussion teaching mode, compared with the traditional lecture teaching mode of "teacher teaching-student acceptance", seminar teaching method can really promote the "mutual growth of teaching and learning" in curriculum teaching. With the development of universities and the interaction between cultures and education all over the world, the "seminar" teaching method was widely popular in Higher Education in western countries in the 19th century. In the early 20th century, Mr. Cai Yuanpei introduced this western teaching method into China's higher education teaching. Later, it was widely loved by Chinese college teachers and widely used in practical teaching. After nearly a hundred years of development, today, "seminar" teaching method is still full of vitality, widely used in college education and teaching, and achieved remarkable results. Seminar teaching method can not only cultivate students' independent thinking ability, analysis and problem-solving ability, but also help to cultivate students' divergent thinking, creative thinking and teamwork consciousness, which meets the requirements of "cultivating higher comprehensive talents" put forward by China's higher education reform, and gradually attracts the extensive attention of domestic higher educators (Dong et al., 2021; Zhang et al., 2021a; Liu, 2020b).

With the development of modern education and teaching, new teaching methods have been emerging in addition to the four teaching methods mentioned here. Each teaching method has its own uniqueness, but also has shortcomings. The implementation process may need to be tailored to local conditions and according to teaching objectives and requirements. Indeed, high quality teaching not only depend on novel teaching methods, but also depend on teaching mode, teaching conditions and teaching methods and other factors, etc. Moreover, curriculum ideological and political education should also be effectively merged together (Zhang et al., 2021b).

4. Teaching Reform and Teaching Resources

4.1. Teaching Reform

Teaching reform should first be oriented to curriculum, which mainly involves in teaching contents, teaching methods, teaching materials and curriculum evaluation, etc. Here, all these ways will be discussed one by one by combining with the teaching situation abroad. In terms of teaching content, there are few foreign

courses, but the requirements are high. We attach importance to both foundation and practice. We hope that we can graft academic advantages into teaching, pay attention to the connection between teaching and scientific research, introduce hot issues in industry into the classroom, integrate theory with practice, and introduce the latest progress in the field of disciplines. I hope to further strengthen the cultivation of practical ability. For example, there are many course project training in the courses of foreign universities. Strengthen the cultivation of literature reading ability, recommend bibliographies and representative papers, increase the reading of international academic journals and expand students' horizons. In case of teaching materials, we hope to use more classic and novel teaching materials. In the way of curriculum evaluation, enrich the assessment methods, strengthen the process assessment, increase the weight of large homework in addition to traditional homework, and improve the learning effect. As for experimental teaching, we hope that the experimental contents can be updated in time, increase the proportion of students' self-designed experiments, and improve the requirements of experimental reports. In terms of teachers, students generally think that teachers are very good, but perhaps due to the school's assessment mechanism, they hope that teachers can spend more time on curriculum teaching and stimulate students' interest in learning. Moreover, It is of great significance to transfer traditional knowledge to cultivate students' "autonomous learning". The well-known Socratic teaching method is to encourage teachers to use dialogue, discussion and heuristic educational methods to ask students questions, constantly expose the contradictions exposed in the answers, correct ideas and guide them to make answers. The status of teachers has retreated from absolute correctness. How to raise questions, how to sort out the logic of questions, and how to awaken students' more potential. The teaching model of mutual stimulation and joint discussion between teachers and students to seek correct problems is also worthy of reference by more universities.

4.2. Teaching Resources

Use Excellent teaching resources are an important factor in improving teaching quality. Teaching resources are various conditions provided for the effective development of teaching, usually including videos, teaching materials, cases, courseware, etc. Of course, they also include teacher resources, teaching aids, teaching infrastructure, etc. With the advent of the "Internet +" era, a series of new teaching modes in the new media times have been developed, such as flipped classroom, micro lecture, massive online open course (MOOC), etc., which have their own characteristics and advantages, opening up a new path for the construction of new teaching resources under the "Four New" concept (Yin, 2022; Wang & Zhao, 2019; Sun, 2017).

Flipped classroom is different from the traditional classroom teaching mode. Under the "flipped classroom teaching mode", students complete knowledge learning at home, and the classroom has become a place for interaction between teachers and students and between students and students, including Q & A and the use of knowledge, so as to achieve better educational results. It has the following distinctive characteristics. First, the teaching video is short and concise. The content of video is shorter than ten minutes, which is convenient for students to learn independently, but it is only a few minutes, which is conducive to self-control. Second, the teaching information is clear. Third, reconstruct the learning process. Fourth, review and test is convenient and fast.

Micro lecture refers to the whole process of wonderful teaching and learning activities carried out by teachers around a certain knowledge point (such as key points, difficulties and doubts) or teaching link in the process of education and teaching inside and outside the classroom with video as the main carrier according to the new curriculum standards and teaching practice requirements. This teaching mode must be carefully designed by a short and complete teaching activity carried out around a knowledge point or teaching link in the form of streaming media with Information means. It can play video, animation and other forms based on network streaming media, which is suitable for mobile learning based on mobile devices. Although there is no complex curriculum system, less teaching content and small resource capacity, it needs exquisite teaching design. The types of micro courses can be divided into pre class review, new course introduction, knowledge understanding, practice consolidation and summary expansion.

MOOC is a large-scale open online course is a new product of "Internet+ education". It is an online open course model based on the theory of connectionism and the open pedagogy of online learning. Courses cover a wide range of subjects, including science and technology, such as mathematics, statistics, computer science, natural science and engineering, as well as social sciences and humanities. Obviously, MOOC has significant characteristics of large-scale, openness and network sharing.

5. Conclusion

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Carrying out first-class undergraduate education and implementing the construction of "Four New" is an important measure to accelerate the modernization of education and realize the connotative development of higher education. Through the implementation of "Excellence one Top program" 2.0, colleges and universities will be guided to comprehensively optimize the professional structure, deepen the comprehensive reform of majors, stimulate students' learning interest and potential, make students busy, make teaching live and strict management, comprehensively revitalize undergraduate education and improve the quality of talent training. Therefore, this paper explores the new mode of teaching reform and talent training based on the concept of "Four New", the new path of teaching resource construction, the reform of curriculum teaching content and teaching methods, pays attention to the interdisciplinary integration, promotes the professional growth of teachers, jointly promotes the construction of

"four new" and the improvement of curriculum infrastructure and quality, in order to promote the "quality revolution" of higher education.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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