# Present Problems and Countermeasures for the Construction of Safety Engineering Course System of Local Colleges under the New Situation

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**Abstract.** Based on social requirements for the professionals of safety engineering under the background of the industrial revolution 4.0, Made in China 2025 strategy and China education new engineering reform, the questionnaire survey and field investigation were carried out on 70 enterprises in 12 industries including metal mine, construction, manufacturing, education, service industry, academic research, etc.. The results showed that compound talents with ability of wide caliber, comprehensive professional knowledge, management, strong sense of responsibility and high quality of safety business were urgently needed for government, enterprise and society. The existing problems of the graduate students in safety engineering in the aspects of the latest cutting-edge, comprehensiveness and systematisms of safety knowledge, the awareness of safety responsibility and integrity and the organizational, communication and coordination required for safety supervision needed to be solved for a local college located in the old revolutionary base area of southern Jiangxi province. These problems were solved emphatically through optimizing curriculum and curriculum system, implementing the scientific research team construction for undergraduate students, strengthen scientific and technological innovation and training, and other ways to improve the theoretical knowledge, ability, comprehensive quality and the emotion of "Family-country" of the safety professionals, so as to meet current development needs of the country.

**Keywords:** new situation; local colleges; curriculum system construction; safety engineering; high-quality interdisciplinary talents.

## 1. Introduction

At present, China's economy has changed from a high-speed growth stage to a high-quality development stage, and is in a new normal period of transforming development mode, optimizing economic structure, and transforming growth momentum [1]. The new technology represented by Internet+, artificial intelligence and big data officially marks the arrival of the World Industrial Revolution 4.0. Meanwhile, the Chinese version of the Industrial Revolution 4.0, i.e., "Made in China 2025" also begun [2]. Economic reform and the scientific and technological revolution are profoundly affecting the development of higher education in China. With the booming development of economy characterized by new technologies, new formats, new industries and new models, it is urgent to cultivate a large number of diversified and innovative engineering talents. Therefore, the reform of new faculty of engineering in higher education has been initiated [3]. From the "Fudan Consensus" in February 2017, the "TJU Action" (Action launched by Tianjin University) in April 2017, the "Beijing Guidelines" in June 2017, and the "Chengdu Declaration" in October 2018, the construction of new faculty of engineering is advancing reasonably and orderly, and has borne some fruit [4]. Under the new situation, the development of safety engineering in Colleges and Universities, especially local colleges located in old liberated area, has been put on the agenda. The reform of the curriculum system is particularly urgent [5].

Many foreign scholars in the field of safety have systematically studied the construction of the curriculum system for safety engineering and the future development trend. Hale A. R. et al. conducted an in-depth analysis of the impact of the curriculum system included in the safety

engineering specialty on the quality of personnel training [6]. Mei Hua-liu et al. reconstructed the curriculum system of measurement technology in the safety monitoring, which belongs to the branch of safety engineering [7]. In view of the current situation of world economic and technological development, Mao Hai-feng has made a thorough discussion and analysis on the discipline construction, knowledge system and curriculum system of the "Safety Science and Engineering"[8]. Shen Shifei elaborated on the development of safety engineering major in China, and conducted an in-depth analysis of the general situation and optimization direction of the safety engineering curriculum system and theoretical foundation construction during the undergraduate period in China [9]. Yang Chunhai et al [10], Jing Guoxun et al [11], Yu Zhaoyang et al [12], Meng Yifei et al [13], Liu Jian et al [14], Zhang Jiangshi et al [15] and Yang Qiubo [16] analyzed the construction of the security specialty curriculum system from the perspective of the national economic and social transform strategic, the current state of the new science and technology revolution, the university's new engineering reform environment, enterprise needs, employment situation, teaching status, graduate training quality, and emerging theoretical knowledge development. In addition, Fan Weicheng and Li Shugang pointed out that it is difficult for local colleges and universities featured in mining, especially those in the old liberated areas, to cultivate professional talents to meet the current needs of the state, society and enterprises for scientific and technological innovative talents in safety engineering. The quality of training does not match the needs of professionals, and the small correlation between curriculum and enterprise demand requires us to optimize and rebuild the safety engineering education system [17, 18]. Mining local colleges and universities in the old liberated areas should actively explore the establishment of a new curriculum system to meet the requirements of national and industrial development under the new situation.

In the paper, taking a mining local university located in Ganzhou district as an example, we conduct detailed and real research from the perspectives of the new engineering reform of university, national economic reform and the state of science and technology revolution, the employment situation of graduates, and the needs of society and enterprises. On this basis, we analyze the problems existing in the curriculum system setting of the safety engineering major, and put forward relevant countermeasures. Those play an important role in improving the quality of training, comprehensive quality, disciplinary system, theoretical basis, and employment rate of students majoring in safety engineering in mining local universities located in old liberated areas.

## 2. The Necessity of Reforming the Undergraduate Curriculum System of Safety Engineering in Mining Local Colleges and Universities of Old Liberated Areas

### 2.1 New Normal Economy.

After entering the "13th five-year period", China's economy has been characterized by the development mode of medium and high speed growth rate, quality and efficiency development mode, adjustment of stocks, optimization of economic growth mode and innovation-driven development. China's economy has evolved toward a more advanced form, a more optimized division of labor, and a more rational structure. The industrial revolution 4.0 represented by high technology such as Internet+, artificial intelligence and big data is deeply affecting all areas of China's economy. As a national strategy, the Chinese version of industrial revolution 4.0, i.e., "Made in China 2025", is accelerating this change, which has brought about profound changes in the whole field of safety engineering. New technologies and new industrial concepts such as intelligent safety, digital safety, and information security are coming one after another. The traditional subject system and theoretical knowledge foundation of safety engineering need to be improved urgently, and the reform of safety engineering curriculum system is imperative.

### 2.2 New Scientific and Technological Revolution Promotes Great Change in Safety Engineering Industry.

Industry 4.0 refers to the use of the Internet of things information system to digitally and intelligently process the supply, manufacturing, and sales information in production, and finally achieve fast, effective, and personalized product supply. "Intelligent Plant", "Intelligent Production" and "Intelligent Logistics" are the prominent symbols of Industrial Revolution 4.0. The Industrial Revolution 4.0 plays an important role in China's industrial transformation and the transformation of China's economic growth mode. China's economic development model will switch from a labor-intensive production model to an efficient high-tech production model. New technology revolutions such as big data, cloud computing, internet+ and other technologies have become an inevitable way for Chinese enterprises to upgrade and develop. Utilizing the new technological revolutions such as big data, cloud computing, and Internet + to improve and upgrade enterprises intellectualized and industrialized is a necessary way for Chinese enterprises to upgrade and develop.

The new technology induced by the Industrial Revolution 4.0 has brought about a subversive and revolutionary impact on the development of the chemical, petroleum, mining, civil, transportation, energy, and environmental industries involved in traditional manufacturing, especially safety engineering. With the extensive penetration of information technology in the field of security engineering, Internet technology, artificial intelligence, and digital technology are embedded in traditional security monitoring and management, safety and health environment detection and monitoring, security design and production, and security education and training. The overall production and operation mode of China's safety engineering has undergone profound changes, and the overall level and competitiveness of the industry have been greatly improved. Therefore, colleges and universities that have set up safety engineering in China must reform and optimize the traditional knowledge curriculum to adapt to the needs of national economic development, social progress, and enterprise transformation and upgrading. It is imperative to reconstruct the curriculum system.

### 2.3 Times Demand of New Engineering Education Reform.

After the rise of Industrial Revolution 4.0, the government rapidly promoted innovation-driven development measures. Major strategies such as "One Belt and One Road", "Made in China 2025" and "Internet +" have been implemented successively. The vigorous development of new technologies, new formats and new modes has put forward higher requirements for engineering and scientific talents, which urgently needs to accelerate the reform and innovation of engineering education. The "Fudan Consensus", "TJU Action", "Beijing Guidelines" and "Chengdu Declaration" constitute the tetralogy of the new engineering education reform and further promote them in depth. For local colleges and universities, especially in the old revolutionary area, how to adapt to the new development of national higher education and the demand of innovation-driven development under the situation of new engineering, carry out research on the construction of college students' safety engineering literacy, and put them into multiple courses. The reform of the curriculum system that integrates convergence and core frontier curriculum construction is the focus of the new engineering construction of safety engineering major under the current situation. For local colleges and universities, especially those in old revolutionary areas, how to adapt to the new development of national higher education and the demand of innovation-driven development under the situation of "new subjects", and how to carry out research on the construction of college students' safety engineering literacy ability, and put it into the reform of curriculum system based on multi-curriculum integration and core frontier curriculum construction are the focus of the new engineering construction of safety engineering major under the current situation.

### 2.4 The Necessity of Enrollment Reform in College Entrance Examination.

The Third Plenary Session of the 18th CPC Central Committee adopted the "Decision of the Central Committee of the Communist Party of China on Several Major Issues Concerning the Comprehensive Deepening of Reform", and made a comprehensive, systematic and clear deployment for the reform of college entrance examination. With the deepening of reform, from 2021, the way of

volunteering for college entrance examination will be a fundamental change. Because the existing safety engineering courses are more related to traditional, arduous and dangerous industries such as mines, petroleum, chemical industry, construction, fire protection, transportation, geological disasters, etc., while the existing student source in college entrance examinees mainly come from single-child families, and the current young people yearn for the ideal of urban taste. Therefore, accelerating the integration of the emerging knowledge theoretical system such as information technology in industry 4.0, big data and Internet + in today's industry, reconstructing the existing safety engineering curriculum system to attract young intellectuals' enthusiasm for the industry is one of the important measures for the safety engineering profession to ensure high-quality and full source of students in the future.

### 2.5 Demand for Graduate Employment Situation.

Taking a local mining college in the old revolutionary area of southern Jiangxi as an example, mine safety is the traditional advantage of safety engineering specialty. However, in the past five years, the employment statistics of graduates have shown that only 29-47% of graduates are engaged in traditional hard industries such as mining, metallurgy, petroleum, chemical industry and geological disaster, and this proportion has declined year by year, to less than 30% by 2018 (Table 1). The number of people in the fields of government, construction, fire protection, postgraduate entrance examination and other fields has increased year by year. On the one hand, with the transformation and upgrading of traditional industries such as mining, metallurgy, petroleum, chemical industry and geological disaster, modern, intelligent and digital equipment has replaced a large number of labors, resulting in a decrease in the demand for graduates. Meanwhile, the expectations of enterprises have increased, such as graduates' digital information technology, computer, mechanical, and English proficiency. On the other hand, with the unprecedented national attention to safety, the demand for safety engineering graduates in construction, fire protection, government and other fields has increased greatly. The knowledge structure system for newly added jobs in the industry is also very different from the traditional industry. For example, information security managers in the government, occupational health and safety administrators in the construction industry, etc. Based on the above reasons, the local colleges and universities in our country, especially the safety engineering specialty similar to the local mining colleges and universities in the old revolutionary area of southern Jiangxi, need to optimize and reconstruct curriculum system to meet the requirements of the development of the times.

## 3. Main Problems Existing in Current Undergraduate Curriculum System of Safety Engineering in Local Mining Universities in Old Revolutionary Areas

### 3.1 Current Situation of Curriculum System of Safety Engineering.

At present, the safety engineering specialty of the university trains compound talents for safety management in safety engineering of enterprises and institutions, who have good moral accomplishment, strong sense of social responsibility, professional knowledge, ability and quality of safety engineering, whose main advantages are mine safety and environmental safety, supplemented by chemical safety, fire safety, construction safety and occupational health and safety. The corresponding curriculum system settings (Table 2) are as follows:

1. The undergraduate curriculum system of safety engineering mainly covers six parts: general education curriculum, basic subject curriculum, professional education curriculum, innovation and entrepreneurship education curriculum, concentrated practice teaching and comprehensive quality.

2. The total number of hours of undergraduates in safety engineering is 2,240, of which 728 hours for general education curriculum, accounting for 26% (680 hours for overall planning curriculum, accounting for 24.3%, 48 hours for public elective curriculum at school, accounting for 1.7%); The basic curriculum of the subject is 632 hours, accounting for 22.6%; the specialized education curriculum is 776 hours, accounting for 27.8% (the core curriculum is 416 hours, accounting for

14.9%, the specialized optional curriculum is 360 hours, accounting for 12.9%); 104 hours for innovation and entrepreneurship education curriculum, accounting for 3.7%; 517 hours for concentrated practice teaching, accounting for 18.3%; 48 hours for comprehensive quality, accounting for 1.7%. Among them, 309 hours for experimental curriculum accounted for 13.79% of the total number of theoretical curriculum.

3.In the curriculum system of safety engineering undergraduates, the basic curriculum of the subject include: higher mathematics, probability statistics, college physics, college physics experiments, general chemistry, analytical chemistry, mechine design foundation, mechanical drawing, descriptive geometry and mechanical drawing, electrical engineering, fluid mechanics, engineering mechanics. The core curriculum include safety principle, safety monitoring technology, safety ergonomic, safety system engineering, occupational health protection engineering, mine ventilation and dustproof, chemical safety engineering, dust control technology, fire protection engineering. Specialized optional curriculum include safety management, safety psychology, safety law, safety standardization, safety evaluation, safety economics, safety English, waste gas treatment engineering, noise control, accident emergency and treatment, building safety engineering, electrical safety engineering, mine safety technology, disaster prevention and reduction engineering, hazard identification and control, special safety equipment, fire control, fire combustion, mining engineering, computer aided design. Centralized education practice includes metalworking practice, cognition practice, production practice and graduation practice.

Table 1. Whereabouts statistics of nearly 5 years graduate employment

| Year | Mine | Metallurgy | Petroleum | Chemical industry | Construction | Earth disaster | Postgraduate | Government | Fire |
|---|---|---|---|---|---|---|---|---|---|
| 2014 | 19% | 11% | 5% | 7% | 18% | 5% | 25% | 5% | 5% |
| 2015 | 17% | 10% | 4% | 8% | 19% | 4% | 27% | 6% | 5% |
| 2016 | 15% | 8% | 5% | 7% | 20% | 4% | 28% | 7% | 6% |
| 2017 | 14% | 8% | 5% | 6% | 20% | 3% | 33% | 7% | 5% |
| 2018 | 10% | 6% | 4% | 5% | 20% | 3% | 39% | 8% | 5% |

### 3.2 The Main Problems in the Current Safety Engineering Curriculum System

Safety engineering is a scientific and technological knowledge system, which has the main research object of various disasters, accidents or hazards occurring in human activities such as people' production and life, based on summarizing, researching and analyzing the disasters, accidents or hazard experiences that have occurred, it uses relevant knowledge in natural sciences, technical sciences, and management sciences comprehensively to identify and predict the insecurities that exist in production and living activities, so as to take effective control measures to prevent accidents or hazards from occurring. After entering the "13th Five-Year Plan", the state, the government, enterprises and society have raised "safety" to a new national strategic level, and the scope of safety disciplines has greatly increased. The main problems in the fields of production safety and public safety have been extended to safety technology and engineering, social safety, information security, food safety, disaster prevention and reduction, nuclear safety, inspection and quarantine, environment and health and other areas. Since "the 18th CPC National Congress", the world has set off a wave of industrial revolution 4.0, the new technological revolution based on artificial intelligence, clean energy, robotics, quantum information technology, virtual reality and biotechnology has profoundly affected various fields of the national economy, especially the construction, machinery, chemical,

mining, energy, transportation, financial investment, insurance, information and other industries involved in the safety engineering are particularly obvious. The traditional curriculum system of safety engineering specialty can no longer meet the training needs of compound senior safety engineering technicians under the new situation at present and in the future. Mainly manifested in the following aspects:

Table 2. Undergraduate curriculum system setting of safety engineering specialty

| Curriculum module category | | Graduation Credit Reqments | Total hours | Experimental hours | Proportion of total credits /% |
|---|---|---|---|---|---|
| General education curriculum | Overall planning curriculum | 42.50 | 680.00 | 194.00 | 24.30 |
| | Public elective curriculum at school | 3.00 | 48.00 | 0.00 | 1.70 |
| Basic curriculum of the subject | | 39.50 | 632.00 | 40.00 | 22.60 |
| Specialized education curriculum | Core curriculum | 26.00 | 416.00 | 52.00 | 14.90 |
| | Specialized optional curriculum | 22.50 | 360.00 | 23.00 | 12.90 |
| Innovation and entrepreneurship education curriculum (Practice with two credits) | | 6.50 | 104.00 | 0.00 | 3.70 |
| Concentrated practice teaching | | 32.00 | 517.00 (Separately) | 0.00 | 18.30 |
| Comprehensive quality | | 3.00 | 48.00(Separately) | 0.00 | 1.70 |
| Total | | 175.00 | 2240.00 | 309.00 | 100.00 |

(1) The foundation is not generous. General education curriculum and subject foundation curriculum account for 26% and 22.6% of the total hours of courses in the existing curriculum system, respectively, and the total of the two is less than 50%. Safety engineering is a comprehensive discipline, which is related to all other branches involved in safety issues (law, systems science, mechanical engineering, information engineering, computer science and engineering environmental science and engineering, public security technology, mining engineering, civil engineering, chemical engineering and technology, transportation engineering, food science and engineering, public health and preventive medicine, management science and engineering, etc.), and their characteristics are collectively characterized. As a local college in the revolutionary old district, the graduates of safety engineering graduates must adapt to the development trend of today's society, and must move toward the construction of a curriculum system with a thick foundation and a wide caliber. The graduates of a single industry (mine, chemical, construction, fire) cultivated according to the traditional curriculum system are only familiar with the knowledge systems of mechanics, chemistry, mathematics, management, physics, etc., but with other knowledge systems such as law, information, computer, networking and machinery are poorly understood, therefore it is difficult to meet the requirements of social development (wide knowledge, proficient in business, and strong comprehensive ability).

(2) The knowledge system is not comprehensive and the teaching materials are relatively old. The existing professional foundation courses and professional course knowledge of safety engineering are concentrated in several industries such as mining, environment, chemical industry, transportation, construction, fire, etc., but other knowledge systems such as artificial intelligence, information technology, epc system network and data technology are seriously vacant. At the same time, the textbooks for undergraduate students in safety engineering are basically compiled for the early days of the "11th Five-Year Plan" and the "12th Five-Year Plan", so the compilation of new textbooks reflecting the latest development trends and knowledge theory of safety engineering is seriously lagging behind. The result is that after the transformation and upgrading of the enterprise, it is necessary to train the newly recruited university graduates for 2-3 years before they can adapt to the requirements of the job and seriously affect the employment of the students.

(3) The practice link is weak. In the current curriculum system, the time of recognizing practice, production practice and graduation practice is one week, three weeks and three weeks respectively. In the actual implementation process, due to internship funds, corporate reception capacity and welcome attitude, enterprises, schools and teachers' practical concerns about students' safety, etc., will actually greatly reduce the practice of each student, and even if they go to an internship company, their actual participation in practice is very rare. The result is that the students' ability to work and solve problems is declining year by year, and the quality of personnel training is worrying.

(4) The curriculum knowledge is not new enough and the update speed is slow. Since the existing courses are basically a summary of the theoretical results and engineering practice experience during the "9th Five-Year Plan", "10th Five-Year Plan" and "11th Five-Year Plan" period, the latest theoretical knowledge and the engineering experience during the "12th Five-Year Plan" and "13th Five-Year Plan" period has not been systematically presented in the form of books and textbooks, which coincides with the industrial revolution 4.0 that has been in full swing during this period, a large number of new knowledge, new technologies and new theories have emerged and produced rapidly, profoundly affecting and changing the existing national economy in the field of safety engineering, the theoretical knowledge system with deep integration of new generation information technology and manufacturing industry, especially the related cross-knowledge theory system of intelligence, information nization and digitization needs to be supplemented and improved in the existing safety engineering curriculum system.

(5) There is a serious lack of innovation and creativity. Among the existing curriculum system of safety engineering specialties, the proportion of innovation and entrepreneurship education course hours is only 3.7%, and that of comprehensive quality course hours is only 1.7%, the sum of the two is only 5.4%. Moreover, the former part of curriculum knowledge is the same and lacks characteristics and novelty. In the new curriculum system, the hours of innovation and entrepreneurship education and comprehensive quality should be increased to about 8-10% as soon as possible, and similar courses such as research team classes for undergraduates, interest classes for undergraduates, workshop classes for enterprises, and advanced theory classes for undergraduates should be offered to stimulate students' creativity and imagination to the greatest extent, and timely understanding and learning of the latest technological developments.

(6) The lack of humanities knowledge and ideological and political education leads to a lack of professional identity. Although "Entrance Education" and "Professional Introduction Courseware" each have 6 hours, due to the limitations of course materials, lecture materials, etc., coupled with the rigid manner of teaching methods and models, it is difficult to arouse the recognition of students in this major, especially the mine safety direction and construction safety direction. In addition, due to the absence of the traditional "Chinese" and "Ideological and Political Courses", the safety professional undergraduates' values, beliefs, and feelings of home and country are lacking, and the pride of the professional profession is not strong, which indirectly affects the learning effect.

## 4. Countermeasures and Measures for the Reform of Undergraduate Curriculum System of Safety Engineering at Local Mining Colleges in the Revolutionary Old District.

The construction of safety disciplines is the demand of social and economic development, with the development of safety disciplines, people's awareness of safety is constantly changing and progressing. Safety science and technology is the key to preventing accidents and reducing losses. In the 1970s, the discipline system and theoretical foundation of China's safety science and engineering have been formed, the establishment and improvement of the discipline of safety science and engineering provides continuous safety technological support and talent protection for the stability and development of human society. In 2016, the fourth round of discipline assessment in our country, the safety engineering discipline was assessed. With the development of the times and the progress of human civilization, safety engineering specialty has been gradually expanded from the original regional narrow "safe production" to involving "macro safety" in many fields such as construction, energy, materials, environment, chemicals, light industry, civil engineering, mining, transportation, aerospace, electromechanical, food, biology, agriculture, forestry, cities, tourism, inspection and quarantine, fire, social culture, public health and administrative management. Faced with the superimposed effect of many factors such as the transformation and upgrading of the national economic situation, the entrance examination for college entrance examination, and the wave of science and technology in the industrial revolution 4.0, the reform of the undergraduate curriculum system for safety engineering in local mining colleges is imminent, the relevant reform measures are as follows:

(1) Optimizing the knowledge structure of the course. In view of the different focuses of research objects in the safety engineering discipline, the existing (mine, construction) safety technology knowledge system is expanded into five sub-disciplines: safety science, safety technology, safety system engineering, safety and emergency management and occupational safety and health, so as to enhance the breadth of the knowledge of undergraduates in safety specialties, and broaden the horizons of undergraduates in safety specialties.

(2) Pay attention to professional connotation and strengthen professionalism. From the aspects of class time and financial resources, it is necessary to strengthen the quality construction of innovation and entrepreneurship and practical teaching, make full use of summer and winter vacation and other maneuvering time, let students deepen modern enterprises, factories, research institutions, contact with actual projects, and establish an interactive mechanism of production and education, and guarantee the continuous supply of talent.

(3) Optimizing and integrating resource content to highlight synchronization. Since the safety curriculum system involves the emerging, comprehensive and interdisciplinary knowledge of science, engineering, literature, law, management, medicine, etc., it is necessary to do a top-level design, optimize and integrate relevant teaching, teaching materials, teachers, and courseware resources of local colleges and universities. To realize the synchronous sharing of the teaching resources of the whole school and even across the campus, to achieve the smooth access to the knowledge system of the "macro safety" curriculum.

(4) Focusing on the quality of training and reflect the comprehensiveness. The proportion of general education courses and subject-based courses in the existing curriculum system will be increased from less than 50% to about 55%. The special change is to increase the number of hours of basic courses such as mathematics, physics, chemistry, computer, mechanics and English, to ensure the quality of undergraduate training for safety specialties, to broaden the knowledge of undergraduates, and to cultivate all kinds of abilities of safety specialties in an all-round way.

(5) It is necessary to emphasis on model innovation and synergy. We should vigorously advocate scientific research into the undergraduate classes, and increase the hours of innovation and entrepreneurship education courses and comprehensive quality courses for safety specialty undergraduates, and fully explore weekend time (such as weekend lecture halls) when essential to

achieve the organic integration of safety specialty training and safety specialty technology (intelligent security, digital security, information security, etc.) development rules.

(6) Enriching the development of the curriculum system and improving the openness. Theoretical knowledge comes from and is higher than practice, but it cannot be separated from practice. It is necessary to fully mobilize the participation of enterprises, especially the large-scale modern enterprises that represent the higher level of the industry, in the construction of the safety engineering specialties curriculum system. The enterprise elements should take part in the whole process of the curriculum system construction, and realize the closer integration of production, study and research. At the same time, it is necessary to appropriately set up humanities and social science courses, strengthen ideological and political education, and cultivate the sense of belonging, pride and national feelings of undergraduates in safety specialties.

(7) Establishing a standardized and rigorous review mechanism for undergraduate textbooks. Textbooks are the most direct and basic way for undergraduates to acquire knowledge. The quality of textbooks is related to the success or failure of the curriculum system. It is obligatory to select textbooks with high quality, comprehensive knowledge system and reflecting the latest and cutting-edge.

(8) We should strengthen the construction of excellent courses, encourage and advocate colleges, enterprises, and research institutes to jointly compile high-quality textbooks (conditional bilingual textbooks), and write high-quality e-learning syllabus, lesson plans, exercises, online courses, online courseware, etc. The information is to ensure the quality of the undergraduate course system for safety specialties from the source.

## 5. Conclusion

Based on the current undergraduate curriculum system of safety engineering in a local mining college in the old revolutionary area of southern Jiangxi, combined with the new situation of national economic transformation and upgrading, industrial revolution 4.0 (big data, Internet +, intelligence technology, information technology) and new engineering reform in higher education, this paper systematically analyzes the existing problems in the construction of undergraduate curriculum system and puts forward relevant countermeasures and suggestions.

(1) Appropriately increasing the proportion of basic, versatile and broad curriculum in the overall curriculum system, so as to realize the construction of the knowledge structure of "macro safety" curriculum with "thick foundation and broad knowledge".

(2) Based on the development of undergraduate students, focusing on the cultivation of thinking methods and abilities, doing top-level design well, optimizing and integrating the content of high-quality teaching resources in colleges and universities, establishing a standardized and strict undergraduate textbook review mechanism, and strengthening the construction of top-quality courses.

(3) We should encourage innovation and practice, promote the in-depth integration of undergraduate teaching and scientific research, and advocate the whole process of infiltration of the enterprise elements into the curriculum system to achieve a more effective combination of production, study and research.

(4) Optimizing the knowledge structure of the course, and incorporating the latest theoretical knowledge such as big data, Internet+, intelligent technology and information technology in the curriculum system setting. At the same time, it is necessary to appropriately set up humanities and social science courses, strengthen ideological and political education, and cultivate the sense of belonging, pride and home country of undergraduates in safety specialty.

## Acknowledgements

The research work described herein was funded by the Education Reform Project of Jiangxi Provincial Department of Education (JXYJG-2018-131), the Undergraduate Education Reform Project of Jiangxi University of Science and Technology (XJG-2017-01), the Graduate Education

Reform Project of Jiangxi Science and technology (YJG2017036), the Higher Education Research Project of Jiangxi University of Science and Technology (GJ 2018-001), Innovation and Entrepreneurship Project for Jiangxi University of Science and Technology Students (DC2018-001). These financial supports are gratefully acknowledged.

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