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Discussion on the Construction of Talent Cultivation Innovation Platform in Local Universities of Undergraduate Education

−From the Perspective of the Cultivation of Innovation Spirits and Ability of College Students

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***Abstract*—This article focuses on strengthening the quality education of students in local universities of undergraduate education and improving their practical ability so as to respond to the severe employment situation of graduates. This article integrates first classroom innovation platform, second classroom innovation platform, practical teaching innovation platform, association innovation platform of college students, self-employment innovation platform of college students, the harmonious campus innovation platform, and the library innovation platform, and proposes some thoughts and methods of constructing the talent cultivation innovation platform. Moreover, some measures are put forward from the perspectives of university macro leadership, personnel training model and evaluation system reform, construction of incentive mechanism, utilization and supporting of social resources. It is expected to enhance the cultivation of innovation spirits and ability of college students, improve their employment competitiveness and self-employment ability and make greater contribution to local economic construction and social development through the construction of the talent cultivation innovation platform.**

Keywords—Talent cultivation; Innovation education; innovation platform; Local university of undergraduate education

I. INTRODUCTION

The cultivation of innovative talents is required in the strategy of constructing an innovative nation. The university education is the foundation of knowledge innovation and technology innovation system, and its responsibility is to cultivate specialized talents with innovative spirits and ability so as to adapt to the multi-dimensional needs of the society [1]. At present, the university graduates' employment difficulty has become the biggest problem faced by university graduates during their job hunting. In 2017, the number of college graduates in China reached a new record of 7.95 million. The problem of the employment of graduates is not merely a new record of data. Instead, the graduates are faced with some structural problems with dispelled excess production capacity, increasing economic downturn pressure and structural reforms. Confronted with the severe employment situation of university graduates, local universities of undergraduates students must strengthen market-oriented awareness, vigorously enhance quality education, pay attention to the improvement of students' social practice ability, and strengthen the cultivation of students' innovative spirit and innovation ability through the construction of the talent cultivation innovation platform, so as to improve college students' employment competitiveness and self-employment ability.

II. SITUATION AND PROBLEMS IN THE EMPLOYMENT OF CHINESE UNIVERSITY GRADUATES

In recent years, with the further expansion of university enrolment and socio-economic development, the employment difficulties of Chinese college students have become increasingly prominent. The proportion of university graduates of 2016 with "full-time employment" six months after graduation is 77.3%, which is lower than the data of 2015 (77.4%) and 2014 (79.2%); the proportion of "self-employment" is 3.0%, which is close to the data of 2015 and 2014 (3.0% and 2.9% respectively); the proportion of graduates that choose "pursuing further study" is 10.3%, slightly higher than the data of 2015 and 2014 (10.1% and 8.9%); the proportion of graduates that are "seeking for a job" is 4.0%, slightly higher than the data of 2015 and 2014 (3.9% and 3.7%) (shown in Figure 1) [2]. The results are based on the open data, while the actual employment rate is much lower.

The employment difficulties of university graduates mainly lie in two aspects: one is the aggregate issue and the other is the structural issue. The aggregate issue of employment is mainly reflected in the contradiction between supply and demand in the graduate employment market. The number of Chinese university graduates of 2011 is 1.14 million, while that of 2017 is 7.95 million (shown in Figure 2), displaying an annual growth rate of 12.1%. Although the growth rate of Chinese university graduates has slowed down in recent years, the total amount is still great, resulting in an oversupply of the labor market and a significant employment pressure of college students due to the fierce competition. In terms of employment

structure, with China's economic development and industrial upgrading and transformation, the specialty structure of college students cannot adapt to changes in the industrial structure, and the reform of higher education lags behind social and economic development, resulting in gaps in the ability of college students. Therefore, employers are more demanding when recruiting college students. The college students are required to have abundant professional knowledge and skills, as well as strong practical ability, work ability and innovation ability [3].

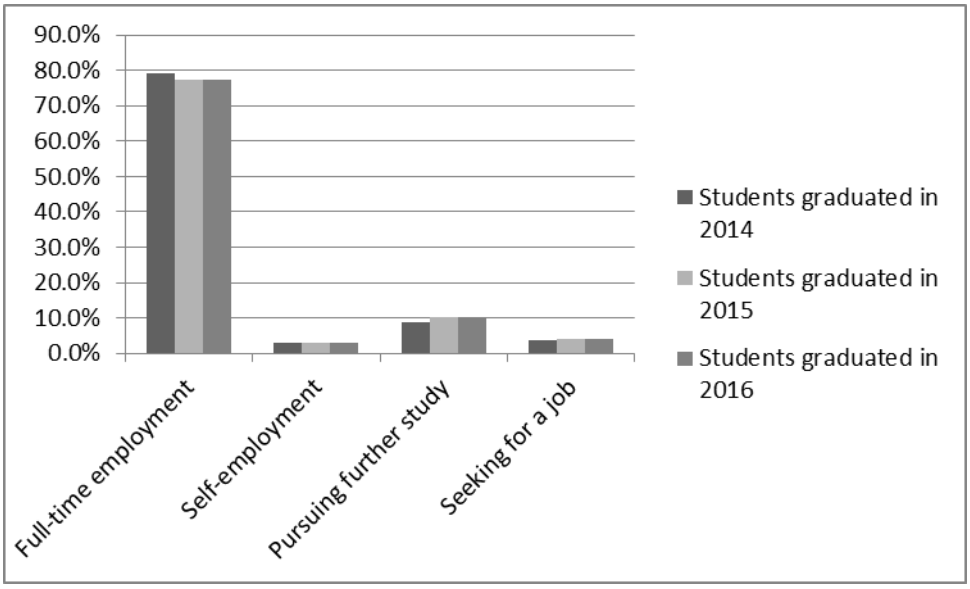

Fig. 1. Distributions of Career Choices among Graduates of 2014-2016 Collected Six Months after Graduation

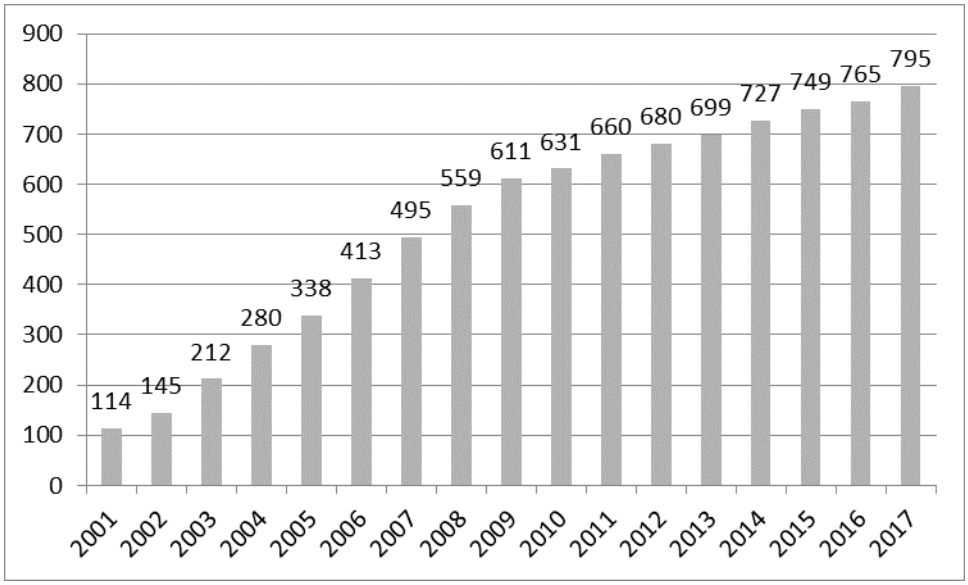

Fig. 2. Numbers of Chinese University Graduates of 2001-2017 (Unit: 10,000 persons)

III. Construction of Talent Cultivation Innovation Platform system

In order to address the college students' employment difficulties and to meet employers' requirements for the capacities of college students, local universities shall build innovation platforms of talent cultivation, so as to strengthen the cultivation of innovation spirits and ability of college students, and improve college students' employment competitiveness and self-employment ability. The talent cultivation innovation platform system may include the first classroom innovation platform, the second classroom innovation platform, the practical teaching innovation platform, the student innovation platform, and the innovation platform of teaching assistance.

A. First Classroom Innovation Platform

(1)Based on the principles of "foundation-focusing, frontier-pursuing, modernization, and comprehensiveness," the structure of public basic courses, optional courses, specialized basic courses, and specialized courses shall be adjusted, liberal education shall be strengthened, the specialty range shall be widened, and professional adaptability shall be improved. Under the premise of enhancing the basis, some specialty-related interdisciplinary courses and courses of edge disciplines shall be added to the curriculum schedule. The proportion of compulsory courses shall be decreased, while the proportion of optional courses shall be increased to more than 10%. Courses on philosophy, humanities, history, geography, sociology, mathematics, physics, life sciences, new materials, electronic information, etc. shall be added to cultivate students' humanistic foundation and scientific knowledge.

(2)In the teaching process, teachers should combine teaching knowledge, ability cultivation with quality improvement, and infiltrate innovation education through teaching. The discussion-based, participatory and heuristic teaching methods shall be adopted; some modern teaching methods such as interactive teaching, demonstrative teaching, virtual reality teaching and experimental teaching shall be used; more development of disciplines and cutting-edge knowledge shall be introduced to the students, so as to enhance teacher-student interaction and to inspire students' thinking and innovation; the improvement of student ability and quality shall be adopted as an important indicator for teaching evaluation.

(3)Preliminary scientific research training shall be added. According to the types of courses and teaching contents, students shall be required to write essays, book reports, and literature reviews of the courses, and academic seminars or report sessions shall be held among students regularly; some promising students shall be allowed to participate in the researches of their tutors as well as some scientific research trainings [4].

(4)Prestigious teachers shall be invited to give lectures. The creativity of teachers would affect the creativity of students. The prestigious teachers usually have a broad vision, a solid foundation of knowledge, and fruitful scientific research outcomes, and often master some methods and techniques of scientific research which are critical to the cultivation of students' innovation ability. Schools should make full use of the resources of prestigious teachers, and implement the mechanism of providing open courses of excellent teachers and prestigious teachers. Moreover, they shall invite outstanding professors in the schools, well-known domestic professors, and well-known overseas scholars to impart knowledge to the students in forms of course or lecture.

(5)Curriculum examination reform shall be implemented. Guided by the principle of cultivating the overall quality of students, a comprehensive assessment of the content and form of the curriculum examination shall be conducted, wherein scientific assessment is required so as to promote the students' comprehensive development. The content of examination should cover not only the basic theories, basic knowledge and basic skills of the courses, but also the comprehensive ability of students of questioning, problem analysis and problem solving; the examination can take the forms of closed-book exam, open-book exams, papers, simulation experiments, social practice, etc.; the grading shall take the usual performance (class attendance, discussion and participation, homework, experimental report results, etc.), scores of quiz, final examination results, etc. into consideration [5].

B. Second Classroom Innovation Platform

(1)Academic lectures with rich contents and diverse forms shall be held regularly or irregularly so as to influence students' academic thought, broaden their horizons, activate their thinking, and improve their humanistic and scientific quality; special lectures on innovation skills and innovative thinking methods and innovative case studies shall be held regularly or irregularly to guide students in innovative thinking training and innovation achievement transformation, and students' innovation activities shall be organized and supervised; on of premises that the requirements on courses and practice mentioned in training program is met, students shall be encouraged to organize extracurricular groups of science and technology related activities with the knowledge learned to carry out discussion on courses, academic report meetings, lecture presentation, etc. and to write summary and book review.

(2)The school shall review and approve the scientific researches suitable for students and funding them annually. Students shall apply for scientific research projects according to their hobbies and specialities, so as to participate in the funded projects and conduct research under the guidance of teachers. The school shall select outstanding papers, research reports for awarding. Students who complete one project shall get 2 credits, while awarded students shall get 3-4 credits. Students can submit project proposals to the schools for funding as well.

(3)Students shall be teamed up to participate in activities such as national, provincial or college curriculum competitions, competitions of knowledge and skills, sports competitions and art competitions; also, students shall be encouraged to invent, create, and design experiments, web, and software; students shall be also encouraged to participate in the Computer Rank Examination, the National Certified Public Accountant Examination as well as other certificate qualification exams.

C. Practical Teaching Innovation Platform

(1)Guided by the needs of society, the training programs for talents of different specialties shall be revised and optimized. The extension of practical teaching shall be further expanded, practical teaching programs shall be formulated, the practical teaching system shall be improved, and the practical talent training programs shall be incorporated into the innovation talent cultivation system. All kinds of teaching activities should fully reflect the application of knowledge, and highlight the subjectivity of students as well as the autonomy, design and innovation of practical teaching.

(2)Practical teaching bases shall be established inside and outside the campuses and be further improved, and conditions of internship shall be improved, so as to break the old model of students which are limited to perceptual knowledge and skill training, and strengthen the comprehensive education and cultivation of students' innovation and practical ability. The construction and management of the practice bases inside campuses shall be strengthened, and a relatively stable professional, comprehensive and production-study-research-based off-campus practical teaching base shall be established as well, so as to meet the requirements of various practical teaching links. Through internship, the practical teaching base shall serve the functions of pilot base of teaching reform, base of students whom are promising for further study, and employment base of graduates [6]. At the same time, schools can jointly establish scientific and technological innovation bases, and cooperate in cultivating high-level innovative talents.

(3)Based on the needs of local economic and social development and the construction of new disciplines, comparative advantages can be formed through the integration of resources and optimization of allocation, which can further facilitate the creation of national or provincial-level key laboratory and experimental teaching demonstration centre. The schools shall strive for the support of the national and local government in co-construction of key laboratories. Investment shall be increased in strengthening the construction of key laboratories. The schools shall be encourage to jointly establish innovation institutions and key laboratories with companies and scientific research institutions, and the opening-up and sharing measures shall be implemented so as to increase the efficiency of investment and vigour of innovation. Increase the opening of teaching laboratories in schools, give full play to the comprehensive benefits of laboratory resources, provide space for students' self-development and practice, stimulate students' sense of innovation and innovation, and fully cultivate students' scientific style, innovative thinking, and entrepreneurship ability and practical ability [7].

D. Innovation Platform of Students

1) Association Innovation Platform of College students

Association is an important platform for cultivating innovative talents, since it can stimulate strong interest and curiosity of students. It is necessary to actively support the construction and development of various kinds of academic associations of students from various colleges, and to enhance the connection between academic associations and the colleges (departments) and youth league committees, and to make full use of the disciplinary advantages of the colleges (departments) to develop academic associations. Students awarded or causing repercussions in competitions of scientific research shall be given additional material and spiritual rewards by their schools. The operating mechanism of the associations shall be improved. For example, various scientific research groups, such as academic salons and research associations, shall be established; students of different grades and different majors can hold seminars regularly or irregularly to discuss cutting-edge issues related to some disciplines. Interests and atmospheres shall be cultivated so as to enhance the attractiveness of academic associations. The coverage of students' participation in associations shall be expanded. All these shall be ensured in the level of policies and mechanisms. There shall be records of participation for each student. A scientific assessment method shall be formed, and the results shall be counted into the credits. Each association shall have at least one instructor to clarify the duties. Associations shall be managed in different ways according to their nature, and mechanisms of rewarding and elimination shall be built. The popularization of science shall be combined with the in-depth cultivation. The stratification and classification of cultivation shall be emphasized. The students with development potential shall be selected from the association for a further cultivation [8]. Every academic association should publish some high-level papers or research reports in some key journals each year. Associations of theories, public welfare, science and technology practice, and cultural and sports shall be established, and the academic, humanistic, and cultural and sports associations shall improve and develop together with increasing influence.

2) Self-Employment Innovation Platform of College students

Self-employment is an important way for university graduates to get employed as well as an important model for college students' cultivation. Schools should set up courses of entrepreneurship education, so as to encourage students to receive systematic entrepreneurial education and entrepreneurship training in college and to cultivate students' innovation spirit and entrepreneurial ability. Schools must carefully organize students to participate in national, provincial, and municipal entrepreneurial plan competitions, to expand their teams, and to create a good atmosphere for students to start their own businesses. Schools shall set up a "self-employment fund" to provide entrepreneurial guidance and consultancy. Entrepreneurial service centres shall be established to provide students with various facilities for entrepreneurship. Students shall be encouraged to start their own business in college, and policy of incentives shall be presented to the students who can start their business and are determined to start their own businesses. For example, these

students can remain enrolled while starting their business so as to keep them concentrating on starting their own businesses. They can continue their studies after obtaining some fruitful outcomes.

E. Teaching Assistance Innovation Platform

1) Innovation platform of Harmonious Campus

It is necessary to strengthen the construction of campus culture and create a harmonious campus environment conducive to innovation. Equal teacher-student relations and harmonious student relations shall be established, civilized campuses and a good education environment shall be created; a relaxed and free learning environment shall be created so as to facilitate the creation of atmosphere conducive to students' personality and potential cultivation. Academic freedom and democracy shall be advocated. Students shall be encouraged to explore, to lead and to boldly put forward new ideas. The innovative thinking of students shall be inspired, and academic atmosphere shall be enlivened, and a relaxed, harmonious, healthy and positive cultural atmosphere for innovation shall be created with effort [9]. Famous scholars at home and abroad shall be invited to give lectures, so as to cultivate academic interests of students. Various academic lectures shall be held actively to broaden students' horizons and enrich the humanistic atmosphere. The media resources of schools shall be fully used to organize innovative journals and websites, to introduce and promote innovation ideas, and outstanding people and advanced deeds in innovation activities; the “top ten innovation persons” and “innovation associations” shall be elected each year and awards for “entrepreneurial star”, “most creative proposal” and “creative idea”, etc. shall be set to create a campus environment conducive to the development of students’ innovative thinking.

2) Innovation Platform of Library

As a university literature and information centre as well as the second classroom of students, library should have a relaxed and autonomous learning environment for the cultivation of innovative talents. The trend of reading shall be promoted, so as to guide students to read more books, read good books and to encourage students to participate in scientific research and development and innovation activities. In this way, the humanistic quality, innovation spirit, and innovation ability of students can be built, so that students can understand, develop and improve themselves through the autonomous learning in library. In such way, the students can become high-quality innovative talents with a solid professional foundation and plentiful knowledge, and the library can serve as a cultivation base of innovative talents.

Thus, literature resources for the cultivation of innovative talents would be provided. In accordance with the current needs of education and teaching reform, schools’ cultivation objectives, and the new trends in social development, the development policy of library collection shall be revised. Under the premise of guaranteeing a certain percentage of literature resources for specialized teaching, interdisciplinary books as well as books of new disciplines shall be collected. The literature resources focusing on application and practice shall be collected [10]. It shall be ensured that literature resources reflecting the latest developments in science and technology (including online resources) is added to the library in a timely manner. The collection of books on professional basic knowledge education and books on innovative ability training should be reasonably proportioned based on the requirements of innovative talent cultivation so that students can form a reasonable professional knowledge structure system with rich philosophical knowledge by reading and applying the library's literature resources.

A humanistic environment conducive to the growth of innovative talents shall be created. The library shall not only infect and cultivate students with the rich literature knowledge, but also exert a comprehensive and subtle influence on students with its cultural atmosphere, creating a learning environment conducive to the development of innovative thinking. The modernization of information equipment, afforestation in the natural environment, beautification construction, and the elegance pursuing of the cultural environment in library shall be enhanced. Through the sculpture, famous aphorisms, corridors of painting and calligraphy, portraits of great people and other cultural landscapes, a positive cultural environment shall be built, in order to encourage students to advocate science, to seek truth, to innovate and to forge ahead baldly. In this way, students are promoted to study freely and actively, and can constantly put forward new ideas, new theories and new methods.

Various activities, such as reading, writing, listening, exhibition, and speaking, shall be organized to provide a platform for cultivating students' innovative abilities. Through the preparation of must-read lists for students, the recommendation of books related to some significant activities, the organizing of special literature exhibitions and various lectures, etc., the cultural quality of college students are improved.

IV. MEASURES

A. Learning socialism with Chinese characteristics in the new era, and creating an atmosphere that values innovation

The importance of school innovation must be fully understood from a strategic perspective and a good atmosphere that emphasizes and supports innovation shall be created. Effective measures shall be taken to optimize the input structure, to cultivate advantages, and to promote the sustainable development of innovation. Schools shall coordinate the innovation platform in campus, the off-campus innovation base and the construction of innovation conditions, and take the platform construction as a breakthrough point to plan reasonably, to adjust properly, to integrate the advantages, and to build a high-level innovation base which would enhance the innovation strength. Management shall be strengthened, and the training of management personnel shall be enhanced to improve the quality and management level.

Schools shall establish a leading group headed by the principal, to further strengthen the macro leadership of innovation. Construction plan and implementation plan for innovation platform construction met with the school's actual conditions shall be formulated. Relevant policies and measures

shall be issued to strengthen organization and coordination, to improve control measures, and to improve control capabilities. Policies can be used to guide innovation behaviours, and to ensure the organization, regulations, measures, and funding for the construction of talent cultivation innovation platform. In such way, implementation of innovation work can be ensured to develop in an efficient, sustained, stable, and coordinated way [11].

B. Following the principle of personalization, and establishing various talent cultivation models

For the cultivation of innovative talents, the time, space, and freedom of thought of students must be guaranteed, so as to provide students with a space for free learning and development and to stimulate students' self-esteem and spirit of innovation. The course election system shall be improved, so that students can be free to choose subjects and courses with fully respect to their personal interests. Recruitment by general disciplines shall be promoted. The professional development and students' interests shall be coordinated to reflect academic freedom and all-round development of personality. Moreover, students shall become the main body of learning, and their initiative of learning shall be mobilized. In such a way, substantial progress in the development of students' individuality can be made, and students can become independent persons with innovative and creative spirits.

C. Reforming talent cultivation evaluation system and highlighting the cultivation of innovation ability

To cultivate students with innovative spirits, teachers must possess the innovative spirits. It is necessary to build an evaluation mechanism for the innovative spirits of teachers and to build an innovative teaching team. In such way, teachers can be encouraged to continuously improve their own quality and scientific research capabilities, to enhance their innovation ability, and to promote the integration of scientific research and teaching. In such a way, a high-quality team of teachers with advanced view, international perspective, strategic vision, innovative thinking and professionalism can be built. The teaching concepts shall be upgraded, and the teaching methods shall be improved. Individualized teaching shall be implemented, students' interests in learning shall be guided, and the cultivation of students' scientific thinking shall be enhanced, so as to provide solid basic scientific knowledge as well as advanced academic theories and ideas for the students.

The fostering of innovative spirits shall be focused and the evaluation mechanism of students shall be improved. The examination system shall be reformed. Flexible and diverse assessment methods, such as oral examinations, experimental operations, curriculum design, course thesis and social practice, shall be advocated. For students with special skills and innovation potential, special teaching plans, designs, and assessment systems can be used [12].

D. Enhancing system construction, and establishing incentive mechanism

Special projects for innovation platform construction shall be established, and supervision and management during project implementation shall be strengthened to ensure project implementation quality and benefits. The requirements of the development of schools' innovative work shall be met, a sound innovation evaluation mechanism shall be built, and the supporting and incentive policies that are coordinated with the evaluation mechanism shall be formulated. Schools should standardize the identification methods for students' innovation credits. The outstanding outcomes of students obtained in extracurricular science and technology activities can be counted as innovation credits in the total credits and the file of performance. Schools must carry out various innovation activities of students to ensure the implementation of the innovative talents cultivation program. By establishing models and praising advanced students, a good campus science and technology atmosphere is established. Moreover, schools must be vigorously reward and propagandise students awarded in international, national and provincial science and technology contests so as to fully mobilize students' enthusiasm and initiative.

E. Utilizing social resources and obtaining social supports

Schools should adapt to the needs of national economic and social development for innovative talents and promote the optimal combination of school intellectual resources and other social resources. The cultivation of innovative talents in schools requires the support of the society. Schools should make use of their own regional and professional advantages, and actively develop the cooperation with enterprises, institutions, and governments. Their connections with fiscal and taxation agencies, foreign trade departments, financial companies, and accounting firms shall be enhanced. In such a way, financial support can be obtained, the transformation and incubation of outcomes can be accelerated, the integration of production, learning and research can be deepened so as to create a good social image and a collaborative atmosphere for education, and to promote innovative talents cultivation in schools.

V. CONCLUSION

Local universities should adhere to the people-oriented principle, and strengthen the sense of innovation. The market demand shall be taken as the guidance, and integration of resources shall serve as the main line. The cultivation of innovative spirits and ability shall be integrated into the whole process of school education, so as to form innovative talent cultivation mode, and to build talent cultivation innovation platform. In such a way, continuous innovation in education concepts, cultivation programs, teaching activities, practice links, and scientific research shall be promoted; the application-oriented and compound senior specialized talents with innovation spirits and ability can are cultivated; the employment competitiveness and self-employment ability of college students are improved, which would make a great contribution to local economic construction and social development.

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