Research on the Training Approaches of Innovation and Entrepreneurship Talents of Business Major in Universities from the Perspective of Big Data

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Abstract—With the continuous integration of emerging technologies such as big data, artificial intelligence, cloud computing and blockchain with various industries, the digital economy is booming. This puts forward new requirements for the cultivation of innovative and entrepreneurial talents in application-oriented universities. Starting from analyzing the impact of big data on innovation and entrepreneurship education in colleges and universities, this paper proposes to use big data technology to build an innovation and entrepreneurship wisdom education platform, realize intelligent information management, and achieve a multi interactive teaching mode integrating big data and online teaching. It also innovates ways to cultivate business innovation and entrepreneurship talents, so as to cultivate high-quality application-oriented talents with strong adaptability, learning ability and innovation ability, adapt to the needs of the digital economy era.

Keywords-big data; innovation and entrepreneurship; personnel training

1 INTRODUCTION

fourth industrial revolution, featuring intelligent creation such as 5G, big data, the Internet of Things and artificial intelligence, is bringing unprecedented profound impact to human society. On the one hand, the social pattern is in the transition period, the industrial structure is constantly adjusted, and the occupational environment changes dramatically, which requires that each employee has the ability to adapt to the uncertain environment; The continuous emergence and rapid change of new technologies, new formats and new models not only require workers to master these new technologies and knowledge, but also need to have the ability to constantly learn and innovate. On the other hand, the application of big data technology has given birth to a new kind of educational productivity. Education is no longer limited to schools and classrooms. Therefore, how to adapt to the changing environment of new science and technology and new normal, and how to cultivate new talents with strong adaptability, learning ability and innovation ability, has become a major issue of education reform.

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2 ANALYSIS ON THE INFLUENCING FACTORS OF BUSINESS STUDENTS' INNOVATION AND ENTREPRENEURSHIP IN UNIVERSITIES

In order to explore the influencing factors of college business students' willingness to innovate and start businesses, this paper will conduct relevant analysis based on the survey data of 151 international business students from Wuhan Business University, and study the ways to promote innovation and entrepreneurship by using big data technology according to the conclusions.

2.1 Research Ideas

The project adopts a progressive hybrid research design. In the first stage, a small-scale qualitative survey was conducted to lay a foundation for the later large-scale quantitative research design and provide explanations for the conclusions of the quantitative research. The quantitative survey data of the second stage are mainly from the "Questionnaire on Entrepreneurship Intention of International Business Students" of Wuhan Business School, which includes three groups of people: students in school, entrepreneurs in school, and entrepreneurs within three years of graduation. The survey was conducted through online distribution of questionnaires. A total of 150 questionnaires were distributed, and 147 valid questionnaires were recovered, with an effective rate of 98%. SPSS26.0 software is used for data analysis, focusing on the impact of innovation and entrepreneurship education in colleges and universities on innovation and entrepreneurship intention of international business students, exploring the linkage mechanism between innovation and entrepreneurship education and entrepreneurial intention, entrepreneurial behavior, and looking forward to finding some influencing factors of the matching degree between entrepreneurial intention and professional education.

2.2 Questionnaire Design

In order to explore the relationship between entrepreneurship education and entrepreneurial intention, through controlling variables such as gender and specialty, it is concluded that among different variables of innovation and entrepreneurship education, entrepreneurial intention and respondents' views on entrepreneurship education show significant differences.

Table 1 Variable Design Table

Dependent Variable	Dummy variable	Innovation and entrepreneurship intention
Control Variable	Professional category	Business (male, female)
Independent Variable	Innovation and entrepreneurship education	Innovation and Entrepreneurship Course (Course Objectives, System, Content, Evaluation)
		Innovation and entrepreneurship training platform (in-class practice, contest, entrepreneurship project incubation)

		Innovation and entrepreneurship measures (funds, venues, teacher guidance)

2.3 Analysis of Data Results

2.3.1 Analysis on the importance of innovation and entrepreneurship education: The proportion of the three types of interviewees participating in entrepreneurship training is different. Only 33% of college students who have not started their own businesses participate in entrepreneurship training, while more than half of the two types of college students who have started their own businesses have participated in entrepreneurship training. On the question of whether entrepreneurship training is helpful for entrepreneurship practice (Figure 1), more than half of the three types of respondents said that innovation and entrepreneurship education is important for entrepreneurship.

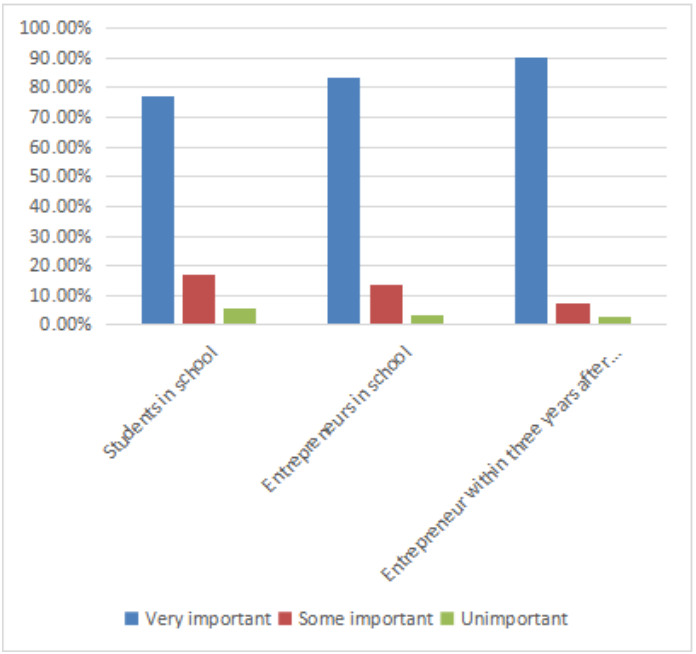

Figure 1. The Importance of Innovation and Entrepreneurship Education

2.3.2 Analysis of innovation and entrepreneurship curriculum: The interviewees generally believe that the current innovation and entrepreneurship curriculum setting goals are not clear, the system is unreasonable, and the evaluation methods should be more diversified. Innovation and entrepreneurship education in colleges and universities needs to further optimize the entire teaching process and teaching methods.

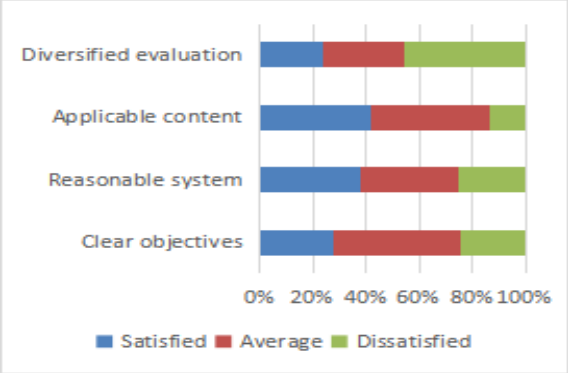

Figure 2. Innovation and Entrepreneurship Course Evaluation

2.3.3 Platform analysis of innovation and entrepreneurship training: The interviewees think that the discipline competition has a very positive impact on innovation and entrepreneurship, but the role of in class practice and entrepreneurship projects needs to be strengthened (Figure 3-5).

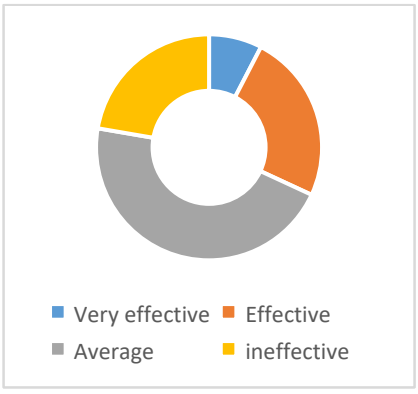

Figure 3. In-class Practice Evaluation

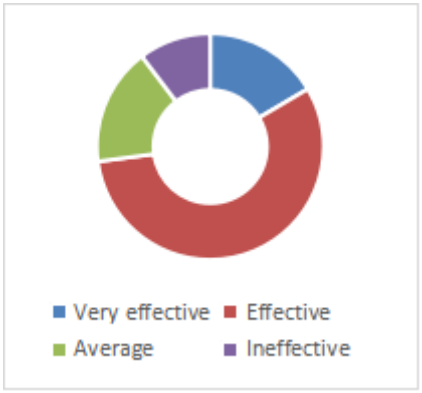

Figure 4. Contest Practice Evaluation

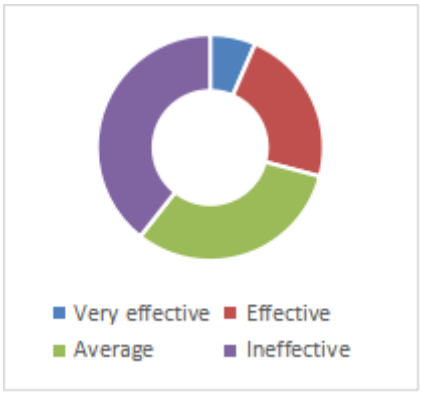

Figure 5. Entrepreneurship Project Evaluation

2.4 Research Conclusions

The innovation and entrepreneurship education in colleges and universities in China started late, and the teaching construction of innovation and entrepreneurship education is relatively lagging behind. There are deficiencies such as vague training objectives, simple curriculum content, weak teachers, and single curriculum evaluation. The depth and breadth of innovation and entrepreneurship education still need to be improved. In particular, local application-oriented colleges and universities often copy the innovative and entrepreneurial education teaching model of comprehensive high-level universities, lack adaptability to their own reality in the target system, content system, and evaluation system, and are generally vague and vague in the target positioning of the curriculum system, which is not closely integrated with the development reality of their own schools; The curriculum is relatively simple, mainly focusing on general education public courses and innovation and entrepreneurship competitions; The construction of teaching staff is relatively weak, and there is a lack of "double qualified" teachers with entrepreneurial practice experience or enterprise work experience; During the course implementation, the theoretical classroom teaching form is monotonous, and the practical part focuses on individual innovation and entrepreneurship competitions; The

curriculum evaluation is more utilitarian, paying more attention to the employment of college students, rather than "innovation and entrepreneurship" itself. In general, the local application-oriented colleges and universities have not yet formed a relatively perfect innovation and entrepreneurship education teaching system. There are problems such as lack of curriculum resources, single curriculum structure, aging curriculum content, weak teachers, monotonous teaching methods, simple and loose curriculum evaluation, students' enthusiasm for learning and recognition are not high, and the effect of innovation and entrepreneurship education cannot meet the expected requirements.

Under the background of rapid development of big data technology, business innovation and entrepreneurship in colleges and universities have not fully played the advantages of big data technology, and failed to build a scientific and reasonable innovation and entrepreneurship teaching model that meets the needs of the new normal economic development.

3 ANALYSIS OF THE ROLE OF BIG DATA IN THE TEACHING MODE OF INNOVATION AND ENTREPRENEURSHIP EDUCATION

The changes brought about by big data are not only in national security and social development, but also in all aspects of people's lives. When it comes to the field of higher education, it has had a positive and far-reaching impact on the ideas and ideas of higher education, or the ways and methods of higher education.

Big data has promoted the reform of innovation and entrepreneurship education ideas. As a subversive technological change, big data has had a huge impact on the management concept, business model, business process and consumer behavior of modern enterprises, thus promoting the adjustment of innovation and entrepreneurship education ideas in colleges and universities[1]. It is not only the updating of technology, but also the upgrading of thinking mode, or the deepening of thinking, which requires us to actively change our ideas, constantly promote the reform of education and teaching, and let students actively adapt to this new change.

The development of big data brings new opportunities for innovation and entrepreneurship education in colleges and universities. By mining and analyzing huge and complex big data, we can grasp the behavior characteristics and operation rules of a specific individual in the world to a certain extent, and make seemingly disorderly data become an important basis for governing activities in corresponding fields. As far as innovation and entrepreneurship education is concerned, local application-oriented undergraduate universities can achieve accurate supply prediction, adjustment and evaluation of innovation and entrepreneurship talent training through the mining and analysis of big data, and formulate the best innovation and entrepreneurship resource supply and demand plan. The biggest feature of the big data era is that information can be interconnected. Colleges and universities can combine regional development reality to cultivate innovative talents, rely on big data to grasp and perceive regional social development, understand regional economic operation data from a macro perspective, take root in regional economic development and need to cultivate innovative talents to enhance the effectiveness and accuracy of innovation and entrepreneurship education in serving local development.

Relying on big data technology, colleges and universities can explore the coordinated development of innovation and entrepreneurship education in colleges and universities and regional society, establish a supporting system of innovation and entrepreneurship precision education mode, reduce the blind supply of innovation and entrepreneurship education, precisely match the supply and demand of innovation and entrepreneurship education, and improve the quality of innovation and entrepreneurship talent training in local application-oriented undergraduate colleges and universities, So as to open a new journey of precision reform of innovation and entrepreneurship education model of local application-oriented undergraduate universities in the perspective of big data (Figure 6).

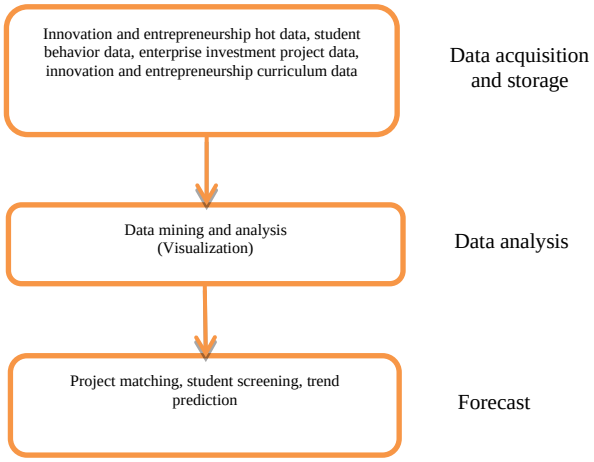

Figure 6. Big Data Technology Application in Innovation and Entrepreneurship

3.1 Big data can solve the problem of innovation and entrepreneurship data analysis

The traditional innovation and entrepreneurship data analysis is fragmentary, superficial and incomplete, which is prone to deviation in the policy analysis, market analysis, financial analysis and other data analysis of the project when cultivating college students' innovation and entrepreneurship projects. Using big data technology, through data capture, collection and analysis, college students' innovation and entrepreneurship teams and entrepreneurial mentors can obtain comprehensive data information, making it easier to make accurate judgments on the feasibility and profitability of the project.

3.2 Big data can solve the problem of single type and low gold content of innovation and entrepreneurship projects

Traditional innovation and entrepreneurship projects often adopt the method of random sampling survey to explore market opportunities. The survey results are often different from the real market environment. In the age of big data, we collect comprehensive data, and data analysis focuses on the correlation between data, which can show the power of innovation and entrepreneurship teams. Write different data analysis codes, and discover the correlation between data from massive data. These weak and inconspicuous correlations can often bring new entrepreneurial ideas and ideas, and generate new market opportunities.

3.3 Big data can identify more students with entrepreneurial potential

The traditional innovation and entrepreneurship education, through classroom teaching, teaches how to evaluate whether they are suitable for entrepreneurship, and often uses the tool of career orientation evaluation scale. It is difficult for entrepreneurial tutors to identify college students with real entrepreneurial potential and provide them with precise entrepreneurial guidance; It is difficult for students to find like-minded people to form an entrepreneurial team and carry out entrepreneurial simulation training. Using big data technology, students' learning and life trajectories during school can be collected as data. Through big data analysis, more valuable information behind the phenomenon can be mined to identify students with entrepreneurial potential.

4 TRAINING CHANNELS FOR BUSINESS INNOVATION AND ENTREPRENEURSHIP TALENTS SUPPORTED BY BIG DATA TECHNOLOGY

The construction of innovation and entrepreneurship education model of application-oriented undergraduate colleges and universities in the context of big data should follow the principles of differentiation, initiative, integration and close integration with local economic development according to its curriculum construction goals and the characteristics of big data. The principle of differentiation mainly refers to analyzing the characteristics of different types of students through data, setting different courses, and teaching students in accordance with their aptitude. The principle of initiative requires that in this model, students' initiative should be taken as the main part, supplemented by the initiative of colleges and universities, so as to improve teaching efficiency; The principle of integration requires the government, universities and enterprises to work together in this model to create a favorable environment for college students; The combination of innovation and entrepreneurship education with local economic development is the educational goal of application-oriented undergraduate universities.

Based on the characteristics of big data technology and the teaching objectives of innovation and entrepreneurship in colleges and universities, this project proposes to cultivate new talents with strong adaptability, learning ability and innovation ability by building an innovation and entrepreneurship education teaching model of "dual platform linkage and collaborative cultivation" supported by big data technology.

4.1 Building an innovation and entrepreneurship wisdom education platform

The core of innovation and entrepreneurship teaching reform is the construction of "big data innovation and entrepreneurship wisdom education platform".

The big data innovation and entrepreneurship wisdom education platform consists of theoretical courses and practical courses. The study of theoretical courses is divided into compulsory courses, elective courses and promotion courses. The theoretical classroom selects high-quality educational resources, pinpoints the training mode of students' innovation and entrepreneurship behavior, breaks the traditional classroom form, changes the education mode, actively introduces flipped classroom, MOOC, seminar learning and other teaching modes, conducts

efficient classroom interaction in combination with digital classroom questions and answers, collects and captures data for analysis after class, and establishes a teaching data resource library to provide a basis for future dynamic adjustment of courses.

Table 2 Content structure of innovation and entrepreneurship education curriculum system

Course Type	Course Content	Course Name
Compulsory Course	Cultivate innovation and entrepreneurship awareness	Career Development and Employment Guidance for College Students; Foundation of Entrepreneurship
Elective Course	Exercise innovative and entrepreneurial thinking	Entrepreneurship Management; Entrepreneurship Financing; Innovation and Entrepreneurship Thinking
Promotion Course	Learning innovation and entrepreneurship methods	Entrepreneurial Marketing; Entrepreneurial Risk Management

The practical courses are divided into three levels: large-scale innovation projects, discipline competitions and entrepreneurial practice. The first stage of education aims to cultivate students' interest in entrepreneurship, help students form preliminary entrepreneurial ideas, stimulate students' enthusiasm for innovation and entrepreneurship, improve students' scientific research and professional innovation ability, let students understand the basic situation of various innovation and entrepreneurship competitions, and prepare for further participation in the competition. In the second stage, the students in the second and third grades are taken as the main objects, and the team simulation training is carried out for the students by taking part in various discipline competitions as the starting point. On the basis of the first stage of education, further improve students' practical ability, and gradually form a competition team in the simulation training to form a certain innovation ability. In combination with entrepreneurial skills training, some students begin to form their own entrepreneurial ideas[2]. The third stage is dominated by senior college students, relying on the college students' entrepreneurship incubation center for entrepreneurial practice testing and project incubation. Take the opportunity of internship or vacation to organize students to investigate in enterprises, communities and villages, verify their entrepreneurial ideas through surveys, and modify and improve the business plan, so that students' entrepreneurial plans gradually become practical.

The platform operation is based on big data information technology, makes full use of the advantages of the Internet, combines experiments with theories, and constructs an excellent diversified intelligent ecological environment. Within the functional scope of the platform, it provides innovation and entrepreneurship information resources for users in need, improves the intelligent processing level of university innovation and entrepreneurship information, realizes the adaptive scheduling of university innovation and entrepreneurship information, reduces the work intensity of university innovation and entrepreneurship information managers, improves the efficiency of university innovation and entrepreneurship information deployment, comprehensively cultivates university students' innovation and entrepreneurship ability, and

promotes the innovation and development of university innovation and entrepreneurship activities.

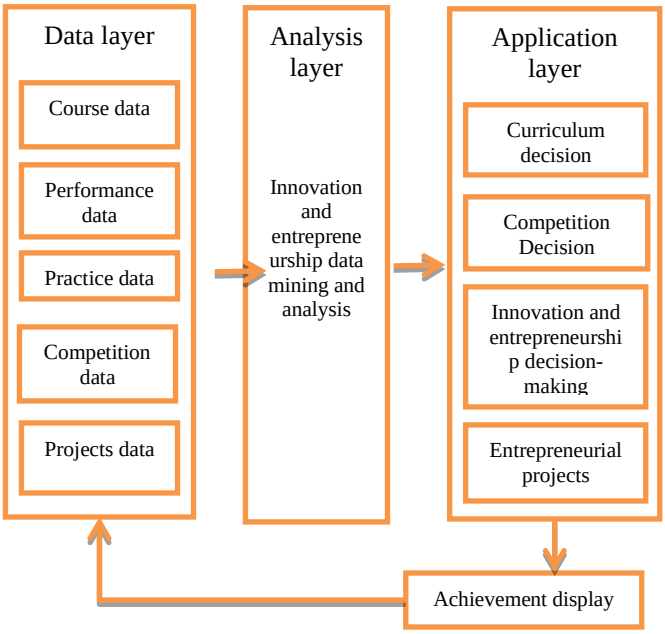

Figure 7. Big Data Technology Application in Innovation and Entrepreneurship

In the data layer, the platform first synchronizes the data and logs generated by the application to the big data system. Sqoop can be used for database synchronization, and Flume can be used for log synchronization. In the later data processing stage, the platform stores the synchronously imported data in HDFS, reads the data for calculation through MapReduce, Hive, Spark and other calculation tasks, and then writes the calculation results to HDFS. Finally, in the data output stage, the platform exports the data in HDFS to the database through the Sqoop system after processing. At this point, the application can directly access the data in the database and display it to the user in real time.

4.2 Introduction of virtual business social environment (VBSE) training platform

A virtual business social environment (VBSE) training system will be established on the big data innovation and entrepreneurship wisdom education platform as a bridge between the theoretical system and the practical system.

The Virtual Business Social Environment (VBSE) training platform is a comprehensive management training platform that integrates multiple professional knowledge. Through the comprehensive training before graduation, students can be trained to understand and master the comprehensive management knowledge of enterprises, which is conducive to the training and improvement of students' comprehensive quality and ability. "Virtual Business Social Environment VBSE Training Platform" conducts all-round simulation operation and management of modern manufacturing industry and modern service industry. Students can train

their comprehensive executive ability, comprehensive decision-making ability and innovation and entrepreneurship ability required for operation and management in the modern commercial society by engaging in different professional posts "work" in various social organizations, feel the business operation under the complex marketing environment, learn to work, learn to think, and thus cultivate their overall awareness and comprehensive professional quality.

The virtual business social environment VBSE creates a virtual business social environment by extracting the typical characteristics of different forms of organizations, so that trainees can conduct simulation operation and business operation in the virtual market environment, business environment, government environment and public service environment according to the actual work business content, management process, documents, and in combination with the business rules set by teaching, It can conduct macro and micro management, multi person collaborative simulation operation and multi organization confrontation. At the same time, depending on the progressive knowledge system from "basic rules" to "management theory and strategy" and the training level based on "operation, logic, theory and application", the ultimate talent training goal of VBSE in the virtual business social environment is guaranteed.

Through the virtual business social environment VBSE platform, students can better connect theoretical knowledge with professional posts, and improve the success ratio of college students' entrepreneurship incubation.

4.3 Measures to implement the integration of big data and online teaching and multiple interactive teaching

Based on the analysis of the current teaching situation, teaching mode and students' learning situation of the business major, the project is based on promoting the improvement of the teaching effect of the business major, cultivating high-quality business professionals, taking big data as the analysis tool, taking network teaching as the integration background, exploring the specific content of the multi interactive teaching mode, highlighting the use of big data mining and analysis tools, and quantifying the multi interactive teaching behavior and process data. Build a static and dynamic model of big data to promote diversified interactive teaching and conduct empirical tests in actual teaching, so as to provide decision-making basis and build a development model for the reform of the teaching model of business majors, the improvement of students' professional ability, and the research on the application of big data in specific teaching modules.

Based on the normalized application and authentic data of the diversified interactive teaching model, and focusing on the relationship between diversified interactive teaching and learning, teaching strategies and other issues, a big database of business professional teaching behavior and process is built to analyze and apply the big data of business professional courses, so as to improve the teaching process The improvement of students' learning enthusiasm and the effect of big data algorithm in teaching practice provide data and theoretical support and lay a foundation for the update of development model[4]. On the basis of exploring the application path and strategy of the multi interactive teaching mode in the business major under the background of big data, the innovative teaching mode constructed in the teaching reform achievements is gradually promoted in the application technology and application method of big data in the teaching mode (Figure 8).

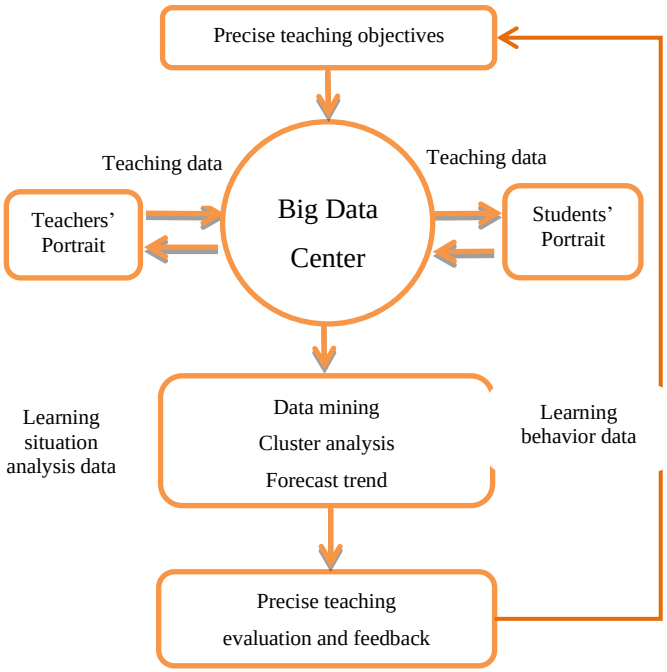

Figure 8. Multiple interactive teaching mode based on big data

For example, in terms of the design of the teaching system, in terms of big data mining, teachers' teaching behavior, teaching status, students' participation in learning, learning effects and other data in the actual teaching process of business majors can be mined through the teaching management system, blue ink cloud and other data systems to build an education and teaching database based on the improvement of education and teaching effects. Design accurate cloud algorithm tools, capture the real data of teaching behavior and process, conduct specific analysis and model construction according to the setting of teaching goals, and promote the accuracy of teaching.

4.4 Collaborative Education Realization

Collaborative education refers to the collaborative training of government, universities and enterprises. As the main body of innovation and entrepreneurship, in the process of implementing the innovation and entrepreneurship education model, colleges and universities should design a scientific curriculum system based on the training objectives, reasonably allocate sufficient teachers and software and hardware resources, and then efficiently organize all teaching links, especially the courses and practice links related to innovation and entrepreneurship, to achieve the innovation and entrepreneurship training objectives. In this process, colleges and universities also need to dynamically monitor the degree of achievement of the training objectives, form a feedback control mechanism for the training process, and dynamically adjust the training process according to the degree of achievement of different training objectives, so as to ensure the realization of the training objectives.

The main role of the government in implementing the innovation and entrepreneurship education model of "one platform, double integration, three levels, and synergy" is to provide a stable policy environment, scientific resource guidance, and a sound regulatory system for all participants; In case of conflict or contradiction among all parties involved, coordinate and promote the implementation of innovation and entrepreneurship education model.

Enterprises and universities cooperate to establish various mass entrepreneurship and innovation education practice bases to provide platform support for the implementation of innovation and entrepreneurship education mode. The forms of cooperation between various platforms and universities can be flexible and diverse, and should not be restricted to certain specific forms. In the process of cooperation, the rights and obligations of the partners in the construction and utilization of the innovation and entrepreneurship practice platform should be clarified by contract, and the withdrawal mechanism of each party should be clarified. The platform should not become a burden for the participants.

5 CONCLUSIONS

The arrival of the age of big data has had a profound impact on the education, management and service models of colleges and universities, as well as the way of thinking, behavior concepts, learning habits of teachers and students. In the future, big data will also completely change human thinking mode, living habits and working rules, and trigger profound changes in the whole society. At present, the application of big data in innovation and entrepreneurship education in colleges and universities is still in the exploratory stage, and there are still many difficulties and problems to be solved. In particular, in the field of innovation and entrepreneurship education for college students, there are problems such as insufficient data integration and low quality, such as how to use big data technology for precise entrepreneurship guidance, how to establish a big data training platform, and how to deeply integrate VBSE training system with curriculum content. To meet the needs of new business development, colleges and universities must constantly adjust the ideas and methods of innovation and entrepreneurship education, use the advantages of big data technology, establish a talent training approach with clear goals, complete systems, multi-dimensional evaluation and platform optimization, and promote the improvement of the quality of innovation and entrepreneurship talents in the process of accurate innovation and entrepreneurship guidance.

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