Transactions on Comparative Education (2024)
Clausius Scientific Press, Canada

DOI: 10.23977/trance.2024.060207
ISSN 2523-5818 Vol. 6 Num. 2

Practice of Curriculum Construction Based on Mobile Big Data Technology Integrating Ideology and Politics into Innovation and Entrepreneurship Education

Xiaodan Li[1,a,*], Xiucheng He[2,b], Xin Huang[1,c], Kang Zhang[1,d]

[1]College of Management, Gansu Agricultural University, Lanzhou, Gansu, China
[2]College of Mechanical and Electrical Engineering, Gansu Agricultural University, Lanzhou, Gansu, China
[a]lixd@gsau.edu.cn, [b]hexiucheng@163.com, [c]huangx@gsau.edu.cn, [d]924687127@qq.com
[*]Corresponding author

Keywords: Mobile Big Data Technology, Ideological and Political Education, Innovation and Entrepreneurship Education, Curriculum Integration Construction

Abstract: The current job market is saturated, and homogeneous talents are often at a disadvantage when seeking employment. In order to help college students adapt to the society better and faster and find their favorite jobs, major universities implement the innovation-driven development strategy of the Ministry of Education, and carry out a new curriculum design that integrates ideological quality and innovation consciousness, and strives to improve college students' innovation consciousness and entrepreneurship. However, the effect of curriculum integration is not ideal, and students' ideological awareness and entrepreneurial employment skills have not been significantly improved. This paper used mobile big data technology to conduct an in-depth analysis of the specific situation of colleges & universities. The results show that the calculation accuracy of big data technology for curriculum fusion is between 94.2% and 97.8%, and the minimum error is 2.22%. Compared with the traditional curriculum formulation method, the results obtained by the algorithm in this paper are more accurate, and it is more conducive to formulating an integrated curriculum that meets the requirements of students.

1. Introduction

At present, the employment situation is severe, and graduates face the problem of "graduation is unemployment". In order to solve the problem of difficult employment and increasing employment pressure for college students year by year, colleges and universities need to do a good job of related education. Li Q studied the three perspectives of students from multiple dimensions, and established a three-dimensional education model of college students' outlook on life and world outlook, which provided practical value and reference significance for the education of college students' awareness in the future, and also provided constructive suggestions for improving the comprehensive quality of college students [1]. Based on family counseling, guided by college ideology and morality, and supported by social training, Liu L believed that it can effectively improve college students'

awareness of ideals and beliefs, and cultivate college students' deep patriotism and strong sense of social responsibility [2]. Parris D L aimed to innovate the business curriculum. By shaping the mindset and skill set of the next generation of socially conscious practitioners, it helps students build a sense of self-efficacy built on their confidence that they can use entrepreneurial thinking and actions to positively impact the world [3]. Warhuus J P discussed from the theory and experience of educators' experiential teaching of entrepreneurship in higher education, creatively drew the experimental entrepreneurship education feedback mechanism on the training platform into a three-dimensional layer, and embedded the three-dimensional algorithm model on the A two-by-two structure to describe the flow and goals of the feedback mechanism. The final results reflected the design and evaluation methods of the model, which can play a special role in addressing the teaching and legitimacy of such courses [4]. The purpose of Chung-Gyu B was to validate the effectiveness of entrepreneurship courses and educational programs recognized by students and graduates. He studied the improvement of curriculum and educational programs run by the Graduate School of Entrepreneurship using Materiality Performance Analysis. The subjects of the study are students and graduates enrolled in graduate schools of entrepreneurship designated by the Korean Ministry of Small and Medium Enterprises and Entrepreneurship. According to research analysis, there were differences in the preferences of graduate students and graduates in accredited courses and educational programs [5]. The research of these scholars was to ensure the employment foundation of college students, promoting the employment of college students and establishing correct ideas. With the progress of the times, we must pay attention to the advantages of information technology, organically integrate mobile big data technology with course construction, and make up for the limitations of traditional courses.

In the competition-assisted evaluation system, statistical comparison and simulation operations are continuously performed, and he applied the intelligent system to university courses. Its derivatives are integrated with artificial intelligence algorithms based on Internet big data technology, which has played a positive role in university course derivatives and their fusion systems [6]. Godwin-Jones R used big data-assisted technology to collect student data, classify and calculate these student information, and match and deliver the instructional design in the process of simulation calculation and analysis. Due to the limited number of students, the student information is static within a certain range. Yes, some spreadsheets and simple data models can be used to perform preliminary analysis and calculations on the collected information to generate valid data that fit the target [7]. Chou C Y proposed a method to develop a course-level open student model, which required the use of the correspondence between courses and core competencies based on big data technology to assess students' core competencies, as well as the courses they have taken and their grades. He used this method to establish a visual analysis system that is suitable for each stage and each major and meets each goal, and uses the system to conduct analysis experiments in the course. After a period of time, he conducted a questionnaire survey to the students of the relevant courses. According to the statistics, more than 70% of the students said that the system can improve their reflection ability and self-improvement ability. It can establish a correspondence between the curriculum and its own core competencies, in addition to saving time for other courses to complete additional goals [8]. In order to study the consumption and learning behavior of students and improve the analysis efficiency, Zheng Y proposed a campus card data analysis method based on big data technology. The results of his analysis divided students into categories that student affairs administrators could take to analyze their behavioral characteristics. According to the analysis results, the administrators who tutor students can formulate different management measures to better serve the students [9]. According to the research of these scholars, it can be seen that the application of mobile big data technology to student behavior and university courses has achieved good results.

This paper integrated the ideological and political courses (IPC) of mobile big data with innovation and entrepreneurship courses, analyzed the specific data of major universities, and analyzed the specific conditions of IPC, innovation and entrepreneurship courses and integrated courses offered by 2,879 universities. Using mobile big data technology to simulate the curriculum construction of ideological and political integration into innovation and entrepreneurship education, the minimum error calculated is only 2.22%, the matching degree of data calculation is more than 94%, and the highest can reach 98%. This shows that mobile big data technology can achieve good results in the integration of curriculum and practice.

2. Curriculum Integration of Ideological and Political Education and Innovation and Entrepreneurship Education

2.1 Current Situation of Integration of Innovation and Entrepreneurship Education and Ideological and Political Education in Colleges & Universities

University innovation and entrepreneurship courses are an important way to teach students innovative thinking, cultivate independent awareness, and master employment skills. It has a special role in the spirit of independence and is the core of talent training [10], and under the current situation, it is particularly important to vigorously strengthen ideological and political entrepreneurship education in colleges and universities. In college education, ideological and political education and innovation and entrepreneurship education have a natural organic connection, which provides an opportunity and a strong framework for the integration of the two [11].

The first is consistency in goals. The overall goals are similar, and firm ideals and beliefs are the support for students' all-round growth, which is the education of students' political morality, ideological morality and mental health. The innovation and entrepreneurship awareness and skills of college students are the foundation of innovation and entrepreneurship education, which is conducive to students' innovation and entrepreneurship. It has a clear understanding of professional choice and entrepreneurship, and improves students' comprehensive quality and ability. Both courses are designed to support the overall growth of college students.

The second is the commonality of content. The main goal of ideological and political education in colleges & universities is to improve students' political, ideological and moral quality, so its content is very rich. The actual development of college students is the main focus of innovation and entrepreneurship education, which includes teamwork and innovation and entrepreneurship awareness, knowledge and practice in related fields such as marketing and management [12]. Obviously, there is a lot of crossover between the two courses.

Finally, the methods are similar. In general, the curriculum basically consists of two different methods: theoretical teaching and practical teaching. In addition, curriculum integration promotes the combined use of various practical teaching techniques with theoretical teaching techniques. Therefore, it is easy to conclude that the two methods are equally extremely similar.

The following table shows the proportion of courses offered by colleges & universities from 2017 to 2020:

Table 1: Comparison of the proportion of courses in different years

course / years	2017	2018	2019	2020
Ideological and Political Course	88%	91%	94%	97%
Innovation and Entrepreneurship Course	81%	84%	87%	92%
Fusion class	9%	17%	21%	33%

By observing the data in Table 1, we can find that the proportion of these three courses is

increasing year by year, indicating that colleges and universities have injected more and more funds, technologies and energy into cultivating students' entrepreneurial skills, practical ability and firm ideals and beliefs, and integrating ideological and political concepts into innovation and entrepreneurship courses has also become the choice of more colleges and universities.

However, there are also many problems with the integration of these two courses.

First, the fusion positioning is inaccurate. Many universities and institutions focus only on preparing students to become entrepreneurs, but neglect to emphasize character development and innovation. In order to enhance the competitive spirit of students, some colleges and institutions have arranged many competitions, which regard college students' entrepreneurship competition as an important part of the curriculum [13]. This approach to education leads most students to believe in instant success and to value the reputation and money of the game, while the path that college students take in learning about innovation, entrepreneurship and ideology is increasingly derailed.

Second, the integration content is not perfect. In order to implement the national policy, many colleges & universities have set up courses on innovation and entrepreneurship, but the courses have not been implemented. Just as an elective course, the course content is small and the credits are low, so it cannot attract students' attention. At the same time, there is a lack of professional teachers, lack of specialized teaching materials, and even ignoring the knowledge of innovation and entrepreneurship. Moreover, different colleges and majors have different knowledge of innovation and entrepreneurship that students need to master, but the courses offered by schools are often similar and lack specificity.

Third, the integration method is not clear. At present, school education has not achieved organic integration, most of the teachers are experts in Marxist philosophy, and lack of research on market forms, employment needs and the actual situation of students, so they can only follow the script when teaching courses. It causes students to fail to learn practical knowledge and misunderstand the curriculum. The school has not taken effective measures to promote the integration of the two courses, and the integration of the courses is superficial.

In summary, it can be seen that the integration effect of the curriculum is not ideal, and there is a big gap with the beautiful vision of college students to integrate into society better and faster and find the job they want. After graduation, there is still a phenomenon that college students are difficult to find employment, many students do not have a clear understanding of their future career plans, and they do not have a clear understanding of their own strengths, interests and careers they want to engage in in the future, which shows that the integration effect of colleges and universities has not played a practical role.

2.2 Mobile Big Data Technology

Mobile big data technology is a method for establishing user dynamic interest model based on big data technology [14]. Many information that cannot be calculated and organized by humans can be interpreted into information that humans can understand with the support of big data technology, which includes the following steps:

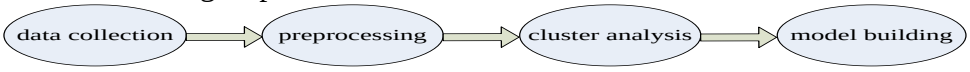

Figure 1: Steps of mobile big data technical analysis

The flow chart in Figure 1 clearly shows the analysis steps of mobile big data technology, which are mainly divided into 4 steps. The first step is to collect data. The specific data of users can be collected with the help of the intelligent platform, including user attribute data, behavior data, user behavior interaction object data, etc.;

The second step is to preprocess the data. The user data collected in the first step can be filtered

to retain key data;

The third step is cluster analysis. The data can be classified according to the similarity between user data, and the data with similar points of interest can be clustered;

The final step is to build a dynamic interest model. The clustering data in step 3 is learned, and the degree of influence of different data on the user's points of interest is calculated, so as to obtain the prediction function of the user's interest value on different points of interest. The space vector model is set by the user's different interest points, so as to complete the establishment of the user's dynamic interest model [15].

The calculation process of mobile big data technology is represented by an algorithm:

First, the matching rate of the input data is calculated and classified according to the user results;

In formula (1), D_C refers to the data matching rate, and X_{DDR} represents the total amount of data. Formula (2) and formula (3) indicate that when the i-th error $error_i$ of X_i is less than the threshold α, X_i is equal to 1, and it is equal to 0 in other cases;

$$D_c = \frac{\sum_i X_i}{X_{DDr}} \tag{1}$$

$$X_i = 0, \text{ other} \tag{2}$$

$$X_i = 1, \alpha \geq error_i \tag{3}$$

The second is to measure user standards, use the total amount of DDR in a time period to find the corresponding user traffic, and count the interest points of users in different periods;

Formula (4) D_r represents the user matching rate, $X_{u,DDR}$ is the total number of DDR of the user in u day. X_{um} in formula (5) and formula (6) represents that the user X_i is equal to 1 when the mth error $error_i$ is less than the threshold α, and is equal to 0 in other cases, which is the same as the calculation process of formula (3);

$$D_r = \frac{\sum_m X_{u,m}}{X_{u,DDR}} \tag{4}$$

$$X_{u,m} = 0, \text{ other} \tag{5}$$

$$P_{DDR} = (P_1 - P_2) / P_1 \tag{6}$$

Formula (6) refers to the matching degree reflected by each DDR, and the calculation result of general formula (6) is between [-100%, 100%];

Finally, according to the calculation results of the formula, the fluctuation of the user's interest value within a certain time range is analyzed and a model is established;

$$X_{u,m} = 1, \alpha \geq error_{u,m} \tag{7}$$

$$\begin{gathered} DDR\ flow\ is: () \\ DPI\ flow\ is: () \\ DDR > DPI, error\ is: () \end{gathered} \tag{8}$$

$$\begin{gathered} DDR\ flow\ is: () \\ DPI\ flow\ is: () \\ error\ is: () \end{gathered} \tag{9}$$

Formula (8) and formula (9) are respectively two different results obtained by calculation, which reflect the weights of different matching rates of X_{um} in formula (7). If the calculation result of

formula (8) is greater than that of formula (9), it means that the first situation is more sensitive to the user, and should pay more attention to the situation reflected by formula (8), and vice versa.

Mobile big data technology is very different from traditional big data technology. The following table shows the comparison between traditional big data computing framework and mobile big data computing framework [16]:

Table 2: Comparison of big data computing frameworks

Computational framework	real-time	fault tolerance
traditional big data technology		
Dryad	Low	Tasks are error prone to redo
GraphLab	Low	Tasks are error prone to redo
MapReduce	Low	Tasks are error prone to redo
Spaek	Low	Tasks are error prone to redo
Mobile big data technology		
S4	high	checkpoint technology
Spark Streaming	high	RDD Lineage Guarantee
Storm	high	RDDs and write-ahead logs
Samza	high	better

According to the comparison in Table 2, it can be found that traditional big data computing frameworks include Dryad, GraphLab, MapReduce, Spaek, etc. It is mainly used in the calculation of static data, and pays more attention to the offline calculation of large-scale data, but the timeliness is poor, the calculation time is long, and real-time data processing cannot be performed. Mobile big data technology focuses on real-time data processing and can handle more complex events. The computing framework can be divided into S4, Spark Streaming, Storm, Samza, etc. It has high computational efficiency and fault tolerance, more applicable scenarios, and more accurate results.

2.3 Impact of Mobile Big Data Technology on Integration of Ideological and Political Education and Innovation and Entrepreneurship Education

With the advancement of technology, colleges and universities must not only integrate courses, but also innovate educational models, make full use of big data technology, and improve traditional teaching and learning models. The flow chart of data input mobile big data of course integration is as follows:

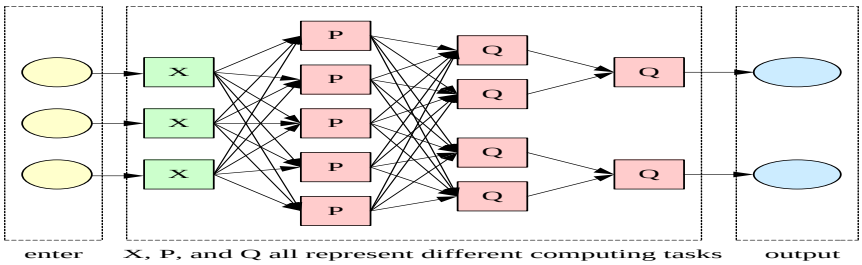

Figure 2: Big data computing framework task processing flow chart

The process of the flowchart in Figure 2 is divided into 3 steps. First, the data related to curriculum fusion is input. Secondly, the calculation of different tasks is carried out, and the results that may be caused by different methods of curriculum integration are analyzed according to the results. Finally, the effective data is output, that is, the curriculum combination measures that can be finally adopted. This paper surveyed 2,879 colleges & universities, and analyzed the IPC and

innovation and entrepreneurship courses in colleges & universities in recent years. The specific data are as follows:

Table 3: The opening of ideological and political courses in colleges and universities

years	quantity	Proportion(%)
2017	2533	88
2018	2620	91
2019	2706	94
2020	2793	97

Table 3 shows the IPC offered by major colleges & universities from 2017 to 2020. The IPC in colleges & universities are relatively common. Every year, colleges & universities are added, and in 2020, a total of 2,793 schools have offered IPC.

Table 4: The opening of innovation and entrepreneurship courses in colleges & universities

years	quantity	Proportion(%)
2017	2332	81
2018	2418	84
2019	2505	87
2020	2649	92

Table 4 shows the basic situation of innovation and entrepreneurship courses offered by colleges & universities in recent years. The proportion has gradually increased from 81% in 2017 to 92% in 2020, indicating that colleges & universities are paying more and more attention to cultivating students' innovative and entrepreneurial spirit.

Table 5: Integration courses of ideological politics and innovation and entrepreneurship

years	quantity	Proportion(%)
2017	259	9
2018	489	17
2019	605	21
2020	950	33

Table 5 shows the offering of integrated courses of ideology and politics and innovation and entrepreneurship. Compared with the number of single courses offered, the proportion of integrated courses offered in colleges & universities is relatively low. In 2017, only 259 colleges & universities across the country offered such courses. Although the proportion of integrated courses has increased greatly over time, the scope of popularization is still relatively small.

There are significant differences in the educational objectives, curriculum system and teaching staff of the two courses. If colleges & universities want to formulate individualized integration courses in line with students' majors, they must conduct surveys on students in each college. They can analyze their interests, energy, specialties, etc., and organize relevant professional teachers to conduct systematic training. This means that the establishment of fusion courses requires a lot of investment in capital, technology and time.

In this paper, the algorithm filters and organizes massive data, sort out massive data and select effective information that meets the conditions for curriculum integration, which is a feasible way for curriculum thinking into innovation and entrepreneurship education. Mobile big data processing can mine data and grasp the differences in students' employment and entrepreneurial interests and the entrepreneurial knowledge required by students of different majors. It thus provides a more suitable solution for the curriculum integration of major colleges & universities, and adjusts the strategy in real time under different conditions to achieve a better integration effect.

3. Practice of Mobile Big Data Technology Integrating Ideology and Politics into Innovation and Entrepreneurship Curriculum Construction

The experiment takes 2,879 colleges & universities as examples, each of which has multiple majors such as philosophy, economics, education and management, and the situation of each major in each school is different. There are currently nearly 40 million college students, and mobile big data technology must be used to filter out valid information from these 40 million data. These college data can be input into the mobile big data algorithm to calculate the matching degree of curriculum fusion, as follows:

$$\begin{gathered} DDR\ flow\ is: 2879 \\ DPI\ flow\ is: 3782\ including\ 17\ records \\ error\ is: 6.3379 \end{gathered} \tag{10}$$

According to the calculation result of formula (10), the mobile big data technology organizes and calculates the relevant information fused in the course, and the obtained data error is 6.34%. It shows that mobile big data has a good curriculum reflection effect on curriculum integration. The data of 15 colleges & universities are subjected to big data simulation operation, and the following results are obtained:

Table 6: Curriculum integration analysis table

data serial number	Input data	Output Data
1	626215	594564
2	678312	634547
3	743396	714545
4	544321	512456
5	786954	744546
6	884321	855545
7	453456	415434
8	562355	545435
9	656858	615443
10	485765	441424
11	573468	544535
12	544545	514445
13	543435	524242
14	321515	314535
15	543876	514555

Table 6 analyzes the integration of 15 groups of college courses. In these 15 groups of data, the maximum error value is 5.85%. The minimum error is only 2.22%, which means that the matching degree of mobile big data technology to data calculation is more than 94%.

The current employment situation is grim. It is not only that there is a shortage of jobs, but some college students also have the problem of being high-minded and low-handed. Interested jobs that do not match their professional knowledge, unskilled professional skills, and lack of clear work goals are all problems that college students may encounter when they are employed. There are also many graduates who are under great work pressure and have difficulty adapting to complex social life, which shows that college students are weak in ideals and beliefs, lack firm beliefs and the courage to face difficulties. Based on these problems, colleges and universities explore integrated courses. On the one hand, it can disseminate the basic knowledge of entrepreneurship to college students, so that students can establish a sense of innovation in practice and clarify the future

development direction in the simulation courses, and formulate their own career plans to work hard for it. On the other hand, it can strengthen the education of ideals and beliefs, enrich the spiritual world of students, and cultivate the entrepreneurial spirit of never giving up and becoming more courageous. Curriculum integration is in line with the current social development status, but the actual integration effect is not good. Popular employment positions, student psychology, teachers' cultural reserves, relevant national policies and other factors would affect the details of curriculum formulation. The traditional curriculum formulation is often formulated by the teachers of the teaching and research groups of major colleges & universities according to the national macro-policy. It cannot comprehensively consider the situation, and largely depends on the teacher's own experience. It unilaterally pursues the matching degree with the superstructure and ignores the objective reality of the students. Curriculum construction based on mobile big data computing can sort out all situations. People can calculate the national policy, student situation, and university reality as important parameters to find the curriculum integration plan that best matches the actual situation. The figure shows the calculation results of mobile big data for various situations.

The results of the computational accuracy of these data are shown in Figure 3.

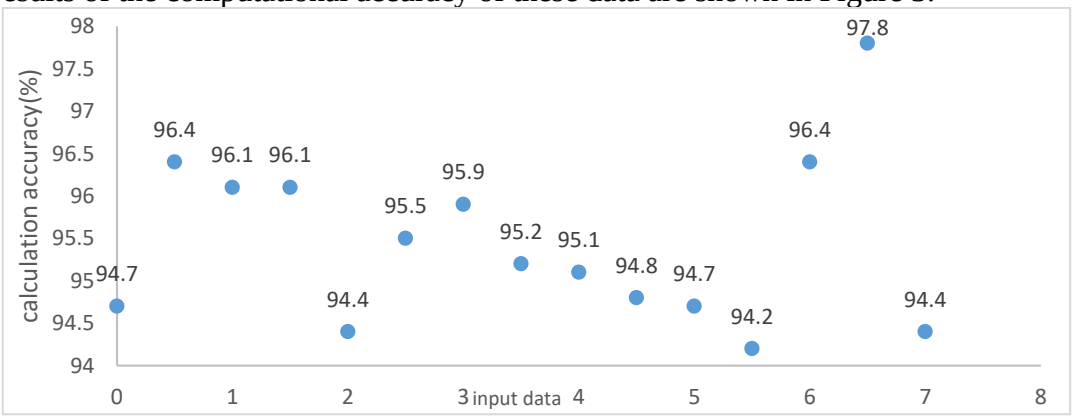

Figure 3: Scatter plot of computational accuracy of mobile big data

Figure 3 shows that the calculation accuracy of mobile big data technology for curriculum fusion is between 94.2% and 97.8%, and the minimum error is 2.2%. The maximum is 5.8%, which means that mobile big data technology can more accurately calculate the effective plan for curriculum construction.

Traditional curriculum construction relies on human computing. Precise formulation requires the collection of a large amount of information, and the calculation time is long and the error is large. Human calculation would inevitably lead to individual subjective judgments, and it is difficult to take into account all students. Students are the audience of the course, and similar courses cannot take into account the learning characteristics of all students. The algorithm in this paper can take into account the individual and general, the interests of students of different majors and the policy of "mass entrepreneurship and innovation", analyze and calculate, and find a feasible way for curriculum construction. The following is a comparison of the traditional course construction and the course construction of the algorithm in this paper.

Figure 4 is a comparison of the accuracy of the two algorithms for the construction of IPC. The data in Figure 5 shows that the effect of mobile big data algorithms on the construction of IPC is significantly better than that of traditional algorithms, and can be optimized by up to 21%.

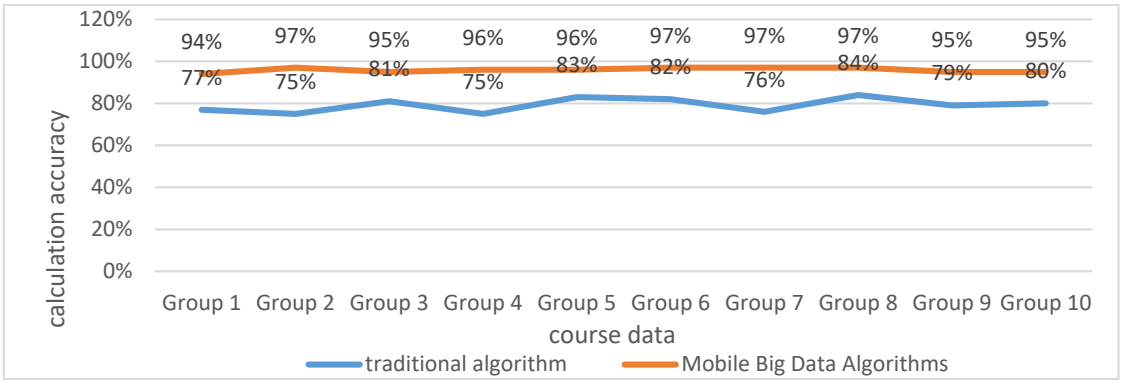

Figure 4: Accuracy comparison of ideological and political curriculum construction

Figure 5 is a comparison of the accuracy of traditional course construction and mobile big data algorithms for innovation and entrepreneurship courses, and the accuracy of traditional algorithms for course construction is between 79% and 83%, and there is a big gap between the accuracy of mobile big data algorithms and 96%-98%.

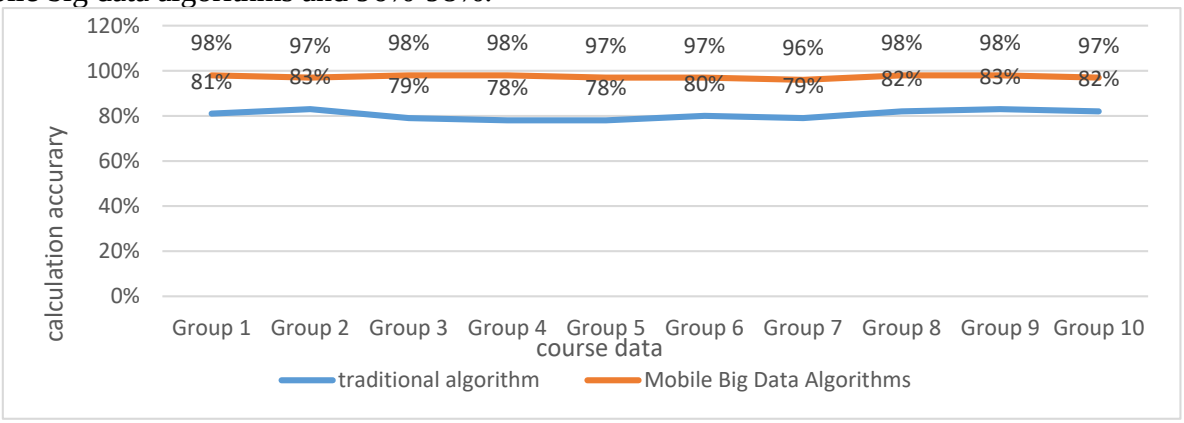

Figure 5: Comparison of the Accuracy of Innovation and Entrepreneurship Course Construction

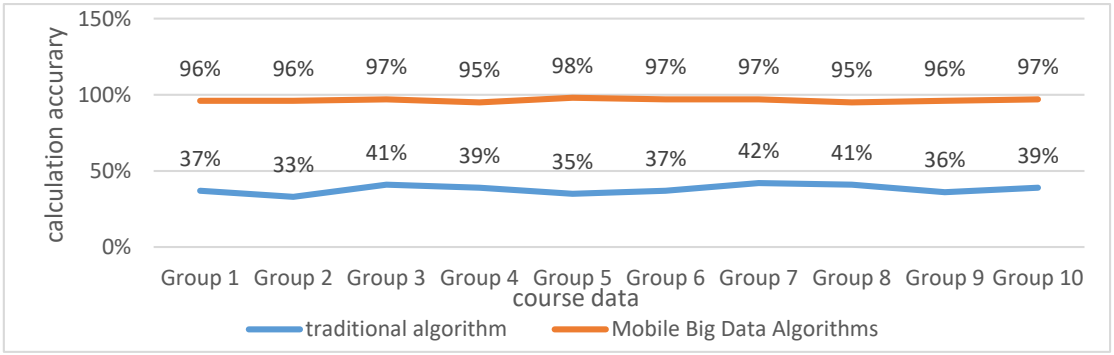

Figure 6: Accuracy comparison of integrated curriculum construction

Figure 6 is a comparison of the effects of curriculum construction. The traditional algorithm can only achieve a maximum calculation accuracy of 42% for the integration course. The mobile big data algorithm is expected to reach a maximum of 98%, and the calculation accuracy is higher than 95%.

According to the comparison of these data, the traditional curriculum development method has great limitations, especially in today's network era, the development of society is changing rapidly, and it is difficult for human computing to fully reflect the complex social reality. Therefore, this

paper uses mobile big data technology to simulate the construction of college courses, and the calculation results show that mobile big data technology has a good effect on the construction of integrated courses.

4. Conclusion

In recent years, major universities have carried out the construction practice of integrated courses. However, the popularization of fusion courses is small and the actual effect is poor. The fusion courses developed by colleges & universities have problems of subjective judgment and limited consideration, which have limited effect on improving college students' innovative awareness and cultivating innovative spirit. This paper uses mobile big data technology to conduct in-depth analysis and calculation of various situations that affect curriculum formulation, including student interests, market requirements, and college conditions. It is foreseeable that after the introduction of mobile big data technology, the curriculum integration construction of colleges & universities can be more efficient and scientific, and the employability of college students can be truly improved. However, mobile big data technology has network security risks, and data quality would affect the final calculation result. In future research, it is necessary to strictly control the data, combine with other excellent algorithms to reduce risks, and provide a more scientific and effective plan for the integration of ideology and politics into the curriculum construction practice of innovation and entrepreneurship education.

Acknowledgement

This work was supported by: 1)2022 Innovation and Entrepreneurship Education Reform Program for Higher Education Institutions; 2) Gansu Provincial Education Science "Thirteenth Five-Year" Planning 2020 General Subjects: Practical Research on the Cultivation of Applied Innovative Agricultural and Forestry Talents in the Context of New Agricultural Science—Taking Land Resource Management Specialty as an Example, Project No.: GS [2020] GHB4640.

References

[1] Li Q, Wu M, Han L. Multidimensional ideological and political education of college students based on the computer platform. Agro Food Industry Hi Tech, 2017, 28(1):871-875.

[2] Liu L. Exploration of Integrating Scientist Spirit into College Students' Ideal and Belief Construction — Based on a Questionnaire Survey of a Normal College in Hunan. Journal of Higher Education Research, 2022, 3(1):34-38.

[3] Parris D L, Mclnnis-Bowers C. Business Not as Usual: Developing Socially Conscious Entrepreneurs and Intrapreneurs. Journal of management education, 2017, 41(5):687-726.

[4] Warhuus J P, Blenker P, Elmholdt S T. Feedback and assessment in higher-education, practice-based entrepreneurship courses. Industry and Higher Education, 2018, 32(1):23-32.

[5] Chung-Gyu B, Chang S, Joo P. A Study on the Effectiveness of Entrepreneurship Education Programs in Higher Education Institutions: A Case Study of Korean Graduate Programs. Journal of Open Innovation: Technology, Market, and Complexity, 2018, 4(3):26-31.

[6] Wang Y, Sun R, Sun W. Research on Algorithms of Fusion System of Artificial Intelligence University Curriculum Derivatives Based on Internet Big Data. Journal of Physics Conference Series, 2021, 1952(4):042044-042046.

[7] Godwin-Jones R. Scaling up and zooming in: Big data and personalization in language learning. Language Learning & Technology, 2017, 21(1):4-15.

[8] Chou C Y, Tseng S F, Chih W C. Open Student Models of Core Competencies at the Curriculum Level: Using Learning Analytics for Student Reflection. IEEE Transactions on Emerging Topics in Computing, 2017, 5(1):32-44.

[9] Zheng Y, Shen L, Zhou Y. Analysis of students' consumption and learning behavior based on the big data of campus card. Revista de la Facultad de Ingenieria, 2017, 32(3):191-200.

[10] Zhu H B, Zhang K, Ogbodo U. Review on Innovation and Entrepreneurship Education in Chinese Universities during 2010-2015. Eurasia Journal of Mathematics, Science and Technology Education, 2017, 13(8):5939-5948.

[11] Daniel, Jato-Espino, Irune. Decision support model for the selection of asphalt wearing courses in highly

trafficked roads. Soft computing: A fusion of foundations, methodologies and applications, 2018, 22(22):7407-7421.
[12] Alon-Beck, Anat. The Coalition Model, a Private-Public Strategic Innovation Policy Model For Encouraging Entrepreneurship and Economic Growth in the Era Of New Economic Challenges. Washington University Global Studies Law Review, 2018, 17(2):5-6.
[13] Redondo J M. Improving Student Assessment of a Server Administration Course Promoting Flexibility and Competitiveness. IEEE Transactions on Education, 2019, 62(1):19-26.
[14] Rajeswari S, Suthendran K, Rajakumar K. A smart agricultural model by integrating IoT, mobile and cloud-based big data analytics. International Journal of Pure and Applied Mathematics, 2018, 118(8):365-369.
[15] Zhang J. Personalized Product Recommendation Model Based on User Interest. International Journal of Computer Systems Science & Engineering, 2019, 34(4):231-236.
[16] Sood S K, Sandhu R, Singla K. IoT, big data and HPC based smart flood management framework. Sustainable Computing: Informatics and Systems, 2017, 20(DEC.):102-117.