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Research on the Integration and Cultivation of Innovation and Entrepreneurship and Civic and Political Education in Colleges and Universities under the Perspective of Big Data

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Abstract With the great importance attached to innovation and entrepreneurship education and civic and political education in colleges and universities as well as the continuous development of big data technology, the fusion of innovation and entrepreneurship and civic and political education based on big data has become an inevitable trend of educational development. Based on the demand for the integration of innovation and entrepreneurship and civic and political education, this paper formulates the goal system of integration training and constructs the structural framework of integration training based on the layered theory. Meanwhile, on this basis, through the study of big data technology, it constructs an accurate fusion human cultivation model based on big data, and establishes a big data system platform for the fusion of innovation and entrepreneurship and civic and political education. Through empirical analysis, it can be seen that the comprehensive score of SA colleges and universities based on the fusion training method of this paper is 4.511, which has the best score and is closer to the excellent level. Compared with SF colleges and universities, the score is 0.567 points higher. And the mean values of overall satisfaction and coverage of SA colleges and universities with this paper's fusion cultivation model are 92.5% and 87.2%, respectively, which are better, indicating that the method of fusion cultivation based on this paper's innovation and entrepreneurship and civic and political education can satisfy students' requirements. This study provides a valuable perspective and support for the fusion culture of innovation and education in colleges and universities.

Index Terms big data platform, stratification theory, innovation and entrepreneurship education, civic education

I. Introduction

Ideological and political education in colleges and universities constitutes a pivotal aspect of moral education for university students, serving as a fundamental component in shaping their ethical development. Innovation and entrepreneurship education, on the other hand, represents a crucial endeavor in response to the prevailing trend of mass entrepreneurship and innovation, and is instrumental in bolstering the employment competitiveness of college graduates [1].

To enhance the ideological awareness and innovation/entrepreneurship literacy of contemporary college students, integrating new media communication advantages, innovating teaching methodologies, and transitioning from traditional knowledge transfer to an "open education" model fostering active exploration and innovation is crucial. This necessitates the seamless integration of ideological and political education with innovation and entrepreneurship training, thereby establishing a collaborative educational framework tailored to students' needs and societal development [2-3]. Consequently, educators must comprehend the nuances of new media and harness their potential to synergize these two educational domains, maximizing their complementary strengths and enhancing the overall effectiveness of the educational process [4].

Simultaneously, to foster the profound integration of the innovation, industrial, capital, and talent chains, it is imperative to establish an innovative and entrepreneurship-oriented talent cultivation model. This necessitates the collaborative improvement of the innovation and entrepreneurship talent development mechanism among universities, schools, enterprises, localities, and research institutes [5]. The active integration of innovation and entrepreneurship education into professional curricula in colleges and universities represents an indispensable adaptation to the ongoing developmental and reformative trends of our time [6].

Based on the context of curricular ideology, this study delves into the essence of integrating professional education with innovation and entrepreneurship education. By analyzing and comprehending the demands of the contemporary era, we identify several shortcomings in the current state of educational integration, including inadequate conceptual

depth, insufficient teacher resources, imperfect curriculum systems, and the absence of robust evaluation mechanisms [7]. Consequently, to address these issues, the integration of professional education with innovation and entrepreneurship education in colleges and universities necessitates a multifaceted approach. This involves reinforcing the concept of infiltration, enhancing systemic guarantees, strengthening the teaching faculty, fostering stronger school-enterprise collaborations, establishing practical platforms, promoting resource sharing, refining the evaluation mechanism, and ultimately, aligning with societal requirements to cultivate a cohort of high-quality, innovative, technical, and skilled talents for the nation [8].

Civic and political education within the curriculum framework emphasizes the fundamental task of moral cultivation and people's education. This necessitates the seamless integration of ideological and political education throughout the entire educational process, fostering the harmonious development and close alignment of professional education, innovation and entrepreneurship education (hereinafter referred to as "bi-innovation" education), and ideological and political education. In the context of the "mass innovation and entrepreneurship" era, universities, as key implementers of the innovation-driven development strategy, must strategically integrate "bi-innovation" education into students' professional skill development.Schuelke-Leech, B.A. conducted two exemplary studies on innovation and entrepreneurship, revealing distinct performance patterns between engineers and entrepreneurs within the innovation process. Specifically, engineers tend to prioritize technological innovation issues [9]. Similarly, Sunny Li Sun et al. utilized the film "I Am Not the God of Medicine" as a case study to underscore the pivotal role of the cinematic medium in enhancing innovation and entrepreneurship education. This approach positively contributes to nurturing students' entrepreneurial mindset and fostering innovative thinking [10].

Centobelli, P. et al. [11] revealed that in higher education teaching and learning, the internal environment exerts a more significant influence on the development of students' knowledge competence and the fostering of a knowledge-seeking mindset compared to the external environment. Additionally, they emphasized the impact of knowledge management strategies on fostering students' innovation and entrepreneurship. Brutigam, V. [12], in his report on a project at the Bavarian University of Applied Sciences, illuminated the effectiveness of entrepreneurship programs tailored to specific target groups, which actively contribute to developing entrepreneurial thinking and motivating students to embark on entrepreneurship.Wong, M. [13], utilizing data from reflective journals of higher education students, highlighted that moral education is recognized by students as instrumental in shaping their values and promoting the establishment of a moral code in society. Meanwhile, Felgendreher, S. et al. [14] examined how sustainable development activities (SDAs) influence the development of students' moral and ethical concepts. Their study showed that while SDAs produce generally positive and effective educational outcomes, their impact is moderated by individual student characteristics and background experiences.Furthermore, Bofarull, I. D. [15] discussed the interplay between students' moral and ethical dispositions and teaching practices, advocating for the integration of character education with intellectual education in schools and other educational sectors to facilitate the harmonious growth of students' minds and talents.

In this paper, we initially delve into the necessity for integrating innovation and entrepreneurship education with civic and political education, thereby establishing the objective of such an integrated training program in colleges and universities. Subsequently, we construct the structural framework for this integrated cultivation by merging content objectives with the layering theory. Furthermore, grounded in the system's operational mechanism, we devise a fusion cultivation approach that harmoniously blends innovation, entrepreneurship, and civic-political education. This approach leverages big data technology to categorize and stratify student groups, enabling the development of a precise, big data-driven fusion cultivation model. The integration of fusion cultivation data is facilitated through the establishment of a big data system platform, ensuring precise management of the fused data. Lastly, we establish an evaluation system comprising three first-level indicators and eleven second-level indicators, validating the practical efficacy of our fusion cultivation model through empirical cases. This study represents a comprehensive exploration towards realizing the integrated cultivation of innovation, entrepreneurship, and civic-political education.

II. The Integration Cultivation Strategy of Innovation and Entrepreneurship and Civic Education in Colleges and Universities

A. Fusion training objectives based on big data

1) Development of integration training objectives

The integration of innovation and entrepreneurship and ideological and political education is carried out on the premise and basis of the integration of moral education [16]. This paper outlines a comprehensive goal system comprising the dimensions of "morality, intelligence, physical fitness, aesthetics, labor, and emotion." In the "virtue" dimension, the primary focus is on fostering social morality. The "intelligence" dimension encompasses not only academic knowledge but also a robust system aimed at nurturing students' innovative and critical thinking abilities. The "body" dimension emphasizes physical resilience, willpower, and sportsmanship. The "aesthetics" dimension prioritizes cultivating noble aesthetic sentiments and perspectives. The "labor" dimension focuses on equipping students with the ability to innovate labor models in the contemporary era, integrating elements such as artificial intelligence, and embodying an intelligent approach to labor. Additionally, the "emotion" dimension underscores the importance of interpersonal skills, emotion regulation, and a balanced development of emotional intelligence and

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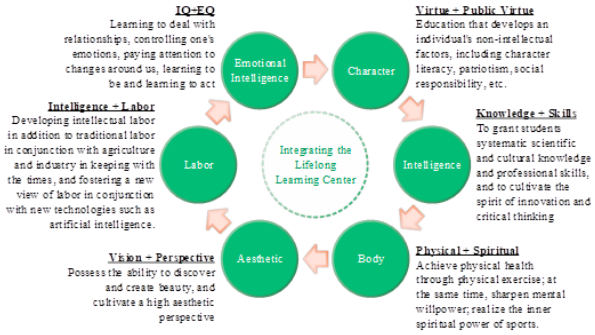

Figure 1: The university fusion culture is determined

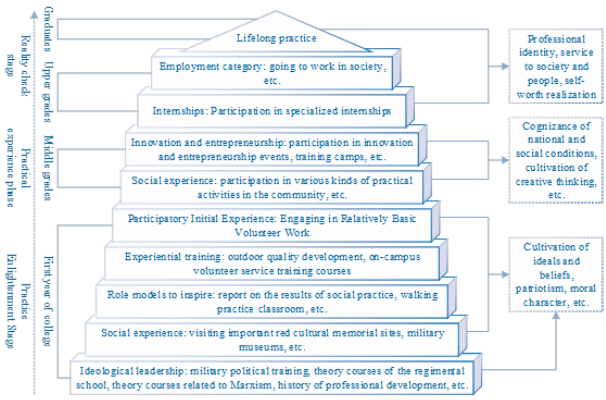

Figure 2: The structure of the fusion culture based on the stratification

cognitive intelligence to enhance students' social adaptability.Furthermore, various training models possess distinct and targeted goals. Specifically, the integrated cultivation of innovation, entrepreneurship, and ideological-political education emphasizes fostering students' innovative mindset, entrepreneurial spirit, and practical competencies. This approach highlights the cultivation and promotion of a contemporary spirit centered on reform and innovation, while also emphasizing students' experiential learning of the creative process, environment, and realities of entrepreneurship.

As depicted in Figure 1, the comprehensive training objectives of colleges and universities are grounded in the overarching theme and direction of "integration," encompassing a diverse array of components and extensions. The integration of ideal belief, as the cornerstone of moral education, necessitates the underpinning and operationalization through specific, varied objectives tailored to distinct educational modalities. These diversified objectives must consistently implement, permeate, and fuse the prerequisites of integrating ideal belief as the core of moral education. Furthermore, they must be guided by the principles of moral education integration, thereby embodying the holistic, unified, and synergistic nature inherent in the integration of innovation and entrepreneurship, alongside civic and political education objectives.

2) Integration training structure based on stratification theory

The structure of integration training, grounded in stratification, is depicted in Figure 2. The term "layering" pertains to the hierarchical organization of content objectives within the integrated training program for innovation and entrepreneurship, as well as ideology and politics education, tailored to various academic years of college students in the temporal dimension and to distinct groups of students in the spatial dimension. This approach stems from the necessity of adhering to the educational philosophy of "differentiated instruction," wherein teaching is customized to the unique abilities and characteristics of individual students. Differentiated instruction necessitates stratification and categorization to cater to students' diverse needs, fostering their strengths while addressing weaknesses, and ultimately enhancing their learning motivation, thereby optimizing educational outcomes.The structure of integration training based on stratification is depicted in Figure 2. The term "layering" signifies the hierarchical organization of content objectives for the integrated training of innovation, entrepreneurship, and ideology and politics education, tailored to different grades of college students temporally and various student groups spatially. This approach is essential for implementing the educational philosophy of "teaching students according to their aptitude," which entails teachers conducting targeted instruction based on the unique characteristics of students, addressing their strengths and weaknesses, and fostering their learning initiative, ultimately maximizing the educational impact. Consequently, teaching according to ability necessitates stratification and segmentation.Secondly, this methodology is well-suited to address the evolving needs of contemporary young students, characterized by an increasingly diversified, differentiated, and personalized trend in their ideologies, behaviors, and interests. Amidst societal advancements, enhanced living standards, globalization, and the deepening of information technology, the modes of social organization and interest patterns have diversified, leading to a corresponding diversification and differentiation in people's ideologies, interests, and behaviors, accompanied by a growing societal acceptance and tolerance.Thirdly, it represents a vivid manifestation and practical necessity stemming from the diversified carriers and objectives of education. The fusion training of innovation, entrepreneurship, and civic and political education aims to unify morality and education, encompassing multiple shared goals like enhancing the socialization of college students. Moreover, it embraces an even broader array of diverse goals tailored to specific practices, training carriers, and student groups, necessitating the layering of the fusion training's structure to meet these varying demands.

B. Mechanism of integration of innovative industries and civic and political education in colleges and universities

The mechanism of the integrated training system for innovation, entrepreneurship, and civic and political education is illustrated in Figure 3. This figure depicts the internal functioning of each component within a defined system struc-

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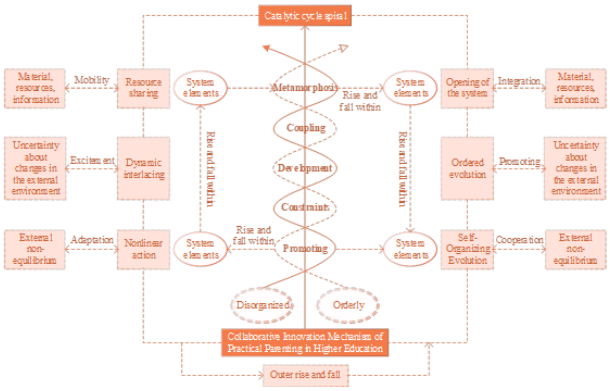

Figure 3: Integration culture system operation mechanism

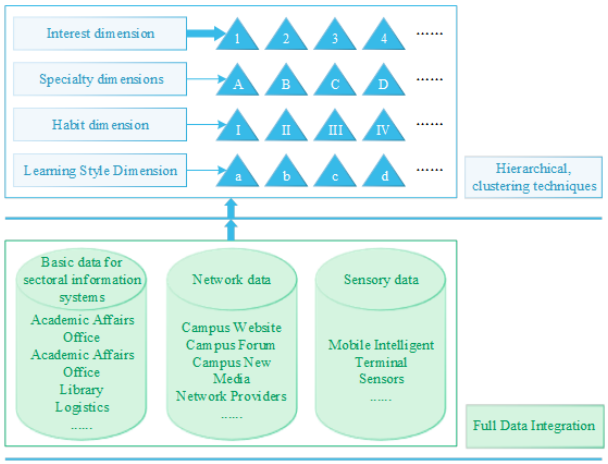

Figure 4: Based on large number of accurate fusion culture mode

ture, as well as the operational rules and principles governing the interconnection and interaction of these components under specific environmental conditions, aimed at achieving a particular function. In the context of big data, the integrated training system for innovation, entrepreneurship, and ideological education in colleges and universities possesses overarching parenting goals and work objectives that must be realized. Its operation adheres to the principle of an objective system.Synergy theory posits that the subsystems within a complex system initially operate independently but, through interaction, ultimately attain a coordinated, orderly state of operation. This process adheres to three fundamental principles of system theory: system openness, the principle of sequential covariance, and the principle of self-organization. The integrated training system for innovation, entrepreneurship, and civic education in colleges and universities is grounded in practical parenting carrier elements and integrates other elements, including the implementation body and operational mechanism of such carriers.Hence, the integration of innovation, entrepreneurship, and ideology and politics education in colleges and universities evolves from the independent functioning of individual elements to their synergistic cooperation. The synergistic operational mechanism of this system is rooted in the aforementioned principles of synergy theory, thereby facilitating the realization of an ideal state where all elements work in harmony.

III. Talent Integration Training Path Based on Big Data

A. Accurate training model based on big data

The precise integration cultivation model leveraging big data is depicted in Figure 4. Central to the personalized cultivation approach is the utilization of big data for effectively categorizing and stratifying student groups and identifying individual differences. By harnessing technologies and methodologies for relationship comprehension and data processing, including classification and clustering algorithms, big data can group data labels that share similar or identical features or attributes into distinct clusters. This capability enables the establishment of relational mappings among students who exhibit comparable knowledge requirements, interests, preferences, reading habits, and research domains, thereby facilitating the intelligent classification and stratification of educational subjects. Consequently, it becomes possible to discern the "class characteristics" as well as the individual differences among students.This study proposes an approach that utilizes big data to realize intelligent classification and stratified grouping of educational objects, enabling the identification of students' "class characteristics" and individual differences. This lays the groundwork for integrating innovation, entrepreneurship, and ideological education in a phased, progressive, hierarchical teaching and personalized training framework tailored to diverse student groups. By leveraging the big data system, we can monitor and comprehend students' learning characteristics, needs, foundations, and behaviors. We employ the Apriori algorithm to mine and cluster students based on shared learning styles, among other factors.During the process of big data clustering analysis, if a particular data point deviates significantly from the clustering results, indicating a lack of fit or overfitting, it underscores the existence of individual differences from the group. In such cases, specific reasons must be investigated and addressed. Furthermore, big data full-sample cluster analysis enhances the granularity of student group classification, facilitating the subdivision of groups and even the identification of novel groups that transcend conventional empirical classifications.

B. Big data system platform for talent integration training

With the emergence of new goals and requirements for the content of data and platform construction, a pivotal objective for the future development of university big data platforms lies in leveraging current mature big data technology alongside traditional database technology to integrate the data amassed through the converged cultivation of innovation and entrepreneurship, as well as civic and political education in higher education institutions. This integration involves the unified storage, consolidation, computation, and analysis of

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diverse data types, enabling rapid querying and retrieval to fully unlock the potential value of university data. Furthermore, it aims to furnish precise and comprehensive decision-making analyses for the future fusion of innovation and entrepreneurship education with civic and political education. The construction of an integrated big data resource base system and platform, spanning the entire university, with standardized, user-friendly operation, and flexible scalability, represents the prevailing trend in the integration of these educational domains within colleges and universities.By establishing data standards, standardizing data management, clarifying operational procedures, and assigning hierarchical access rights, an integrated big data resource information database for students has been formulated, thereby establishing a unified, standardized, and digitized education management system for college students. This system enables the realization of full life-cycle management of student data, effectively maximizing the value of data application. The operational architecture of the big data system for integrating innovation and entrepreneurship education with civic education is depicted in Figure 5. The processing flow of big data can be broadly categorized into four distinct stages: data perception and collection, data processing and integration, data analysis, and data interpretation.In accordance with the fundamental principles and methodological steps of big data platform construction, as well as the practical context of integrated training in innovation and entrepreneurship, and civic and political education, this paper delineates the construction and operation of the big data resource base for this fusion training into five key modules and processes: data collection, data pre-processing and storage, data mining and analysis, data application and visualization, and data feedback.

Big data collection entails the utilization of data sensing systems, network communication systems, sensing adapter systems, intelligent identification systems, and software and hardware resource access systems to achieve intelligent identification, positioning, tracking, access, and transmission of vast amounts of data. This process aims to acquire a diverse range of structured, semi-structured, and unstructured data. Currently, prevalent methods for big data collection encompass sensor-based collection, radio frequency identification (RFID), data retrieval and classification tools, as well as barcode technology. Big data collection constitutes the initial and fundamental step in the construction of a big data platform designed to integrate innovation and entrepreneurship education with civic and political education in colleges and universities.The application process of the data platform for the integration of innovation and entrepreneurship education with ideology and politics education in higher educational institutions is illustrated in Figure 6. The five stages of this platform—data collection, data pre-processing and storage, data mining and analysis, data visualization and application, and data interpretation and feedback—form a data-information-theory-practice value cycle. This cycle inherently adheres to the epistemological principle of dialectical materialism, embodying a cyclical cognitive progression from practice to cognition,

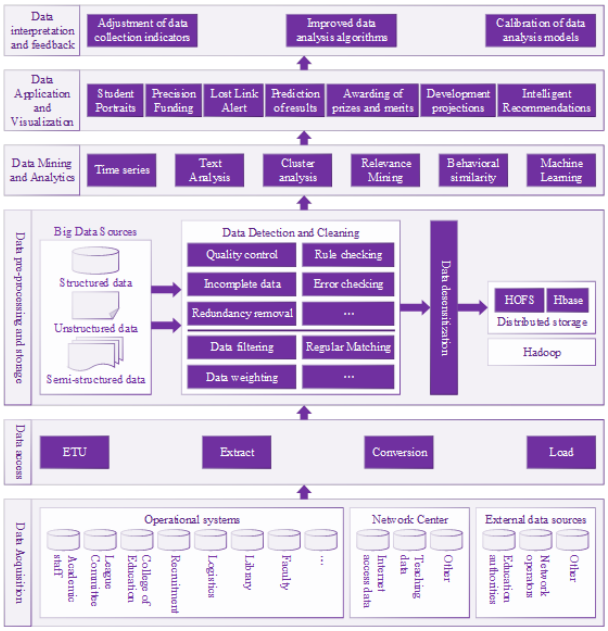

Figure 5: The fusion culture is based on the system operation structure

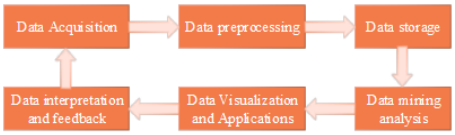

Figure 6: Fusion culture data platform application process

and vice versa, thereby fostering a continuous and iterative learning process.

IV. Empirical Analysis of Integration Cultivation in the Perspective of Big Data

A. Construction of evaluation index system for quality of integrated training

The evaluation framework for the integration and fostering of innovation, entrepreneurship, and ideological and political education encompasses three primary dimensions: Dimension A, focusing on the level of education and nurturing; Dimension B, assessing the depth of integration; and Dimension C, examining the breadth of cultivation and integration. This framework is derived from a comprehensive analysis and distillation of the inherent characteristics, content coverage, and stakeholder involvement in both innovation and entrepreneurship education, as well as ideological and political education. Following a questionnaire survey administered to 350 experts and a subsequent consistency test, the weights of individual indicators were determined, thereby enabling the construction of a comprehensive evaluation index system.

The indicator system for the integration and cultivation of innovation, entrepreneurship, and ideological education is presented in Table 1, where the weights assigned to the

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Primary indicator	Weight	Secondary indicator	Weight	Total weight
Education culture level (A)	0.420	A1	0.350	0.145
		A2	0.350	0.145
		A3	0.124	0.047
		A4	0.176	0.083
Depth of fusion level (B)	0.300	B1	0.201	0.052
		B2	0.274	0.063
		B3	0.258	0.098
		B4	0.267	0.087
Culture fusion span (C)	0.280	C1	0.340	0.082
		C2	0.459	0.125
		C3	0.201	0.073

Table 1: The index system of innovation and education integration culture

three primary dimensions—education and cultivation level (A), depth of integration level, and breadth of cultivation and integration (C)—are 0.420, 0.300, and 0.280, respectively. The eleven second-level indicators comprise ideological and political education (A1), innovation and entrepreneurship education (A2), classroom channel (A3), daily education (A4), depth of ideological understanding (B1), depth of educational guarantee (B2), depth of policy guarantee (B3), depth of cooperation level (B4), breadth of curriculum system (C1), breadth of team building (C2), and breadth of practice platform (C3). Notably, within the education and cultivation level (A), the weights of ideological and political education (A1) and innovation and entrepreneurship education (A2) are the highest, both at 0.350, signifying the paramount importance of the quality of instruction in these courses on the overall education and cultivation level. In the depth of integration level (B) and breadth of cultivation and integration (C), the depth of educational guarantee (B2) and breadth of team building (C2) hold the highest weights, at 0.274 and 0.459, respectively, underscoring the crucial role of enhancing the depth of educational support and teacher team development in advancing both the depth and breadth of integration. Consequently, elevating the standards of ideological, innovation, and entrepreneurship education, ensuring robust educational guarantees, refining the training system, and bolstering the capabilities of the teacher team are pivotal to improving the quality of integrated education.

B. Quality analysis of integration training based on big data

1) Comparative analysis of the quality of integration training in different schools

The constructed quality evaluation system of fusion training is further applied to practice to objectively evaluate the level of fusion training of innovation and entrepreneurship and civic education in colleges and universities. In this study, 6 colleges and universities in S province are selected as research objects, covering different types of colleges and universities such as 985, 211, provincial colleges and universities, comprehensive colleges and specialized colleges and universities, etc. They are respectively noted as SA∼SF, of which SA colleges and universities are the fusion training model of this paper. And respectively, the school leaders in charge of academic work

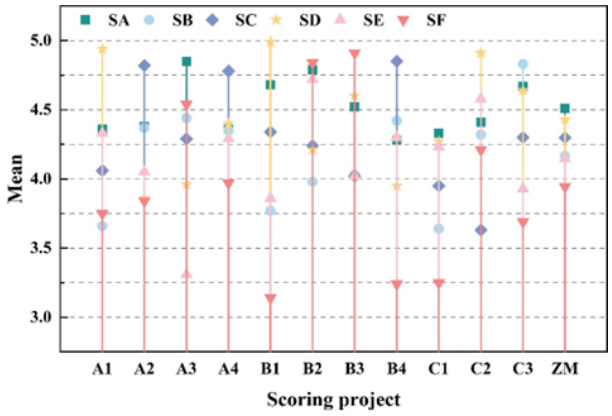

Figure 7: Comparison results of the fusion culture of different schools

or the head of the Academic Affairs Office or the head of the Academic Affairs Office of the six colleges and universities were allowed to fill in the scale objectively as representatives, which greatly ensured the authority and representativeness of the obtained data. The scale adopts 5 levels of scoring, corresponding to each index scoring assignment as poor = 1, average = 2, better = 3, good = 4, excellent = 5, ZM indicates the average comprehensive score, the results of the comparison of the quality of integration training in different schools are shown in Figure 7. Overall, only the SA colleges and universities based on the method of this paper have all the index scores above 4, and the other colleges and universities are slightly deficient in other aspects. The SA colleges and universities with this paper's integrated cultivation model have an overall score of 4.511, which is the best score and closer to the excellent level. Among them, SA colleges and universities have the highest scores of A3 of course channels and B2 of depth of education guarantee, which are 4.85 and 4.79 respectively, indicating that the cultivation model of this paper can effectively expand classroom channels and have more perfect education guarantee, thus improving the comprehensive level of fusion cultivation. In contrast, the comprehensive scores of the five universities of SB, SC, SD, SE and SF are 4.165, 4.298, 4.430, 4.147 and 3.944, respectively, which are lower than those of SA universities, among which SF universities have the lowest comprehensive scores of integrated cultivation, which is 0.567 points lower compared with SA universities. It confirms the effectiveness of the fusion cultivation method of innovation, entrepreneurship and civic education based on big data in practical application, which has better performance compared with other fusion cultivation methods.

2) Analysis related to the quality of integration training

The quality of integrated training in universities, focusing on the fusion of innovation and entrepreneurship education with ideological and political education, is analyzed based on the results of a survey and statistical analysis. The outcomes of this correlation analysis are presented in Table 2. All eleven indicators—including ideological and political

education (A1), innovation and entrepreneurship education (A2), classroom channel (A3), daily education (A4), depth of ideological understanding (B1), depth of education guarantee (B2), depth of policy guarantee (B3), depth of cooperation level (B4), breadth of curriculum system (C1), breadth of team building (C2), and breadth of practice platform (C3)—exhibit significant correlations.Specifically, ideological and political education (A1) and innovation and entrepreneurship education (A2) display a positive correlation at the 0.05 level, while their relationships with classroom channel (A3), daily education (A4), depth of ideological understanding (B1), depth of education guarantee (B2), depth of policy guarantee (B3), depth of cooperation level (B4), breadth of curriculum system (C1), breadth of team building (C2), and breadth of practice platform (C3) are all significantly positive at the 0.01 level. Notably, the highest correlation coefficient is observed between ideological and political education (A1) and depth of education guarantee (B2), at 0.975, indicating a strong relationship. Following this, the depth of cooperation level (B4) and the breadth of the curriculum system (C1) exhibit a substantial correlation, with a coefficient of 0.862.

3) Conducting analysis based on big data integration training

Utilizing the data system platform of this study, we conducted a statistical analysis on the integration training programs offered by SA universities. Specifically, we examined the development of nine distinct course categories: political philosophy (K1), economic management (K2), marketing (K3), innovative thinking (K4), design thinking (K5), business development (K6), innovation management (K7), entrepreneurial financing (K8), and creativity expansion, which collectively represent the integrated training of innovation, entrepreneurship, and civic and political education. The outcomes of our statistical analysis regarding course development are presented in Figure 8.

As evident from the figure, economic management courses (K2) exhibit the highest number of offerings, totaling 180 courses, followed closely by business development and creativity expansion with 175 and 170 courses, respectively. In terms of the average number of learners per course, creative management courses (assumedly a category not explicitly listed but inferred from the context) lead with an average of 2,548 learners, while economic management courses follow with an average of 2,057 learners, and creative development courses (similarly, a category inferred) rank third with an average of 1,011 learners.Comparing the number of courses offered with the average number of learners provides insight into the supply and demand dynamics of these courses. For instance, while political philosophy courses (K1) are offered 142 times, their average learner count is only 897, suggesting a relatively low demand compared to the supply. Similarly, innovative thinking courses (K4), with 159 offerings, attract an average of 1,342 learners, indicating a disparity between the number of courses and learner interest. This finding underscores the need to enhance the quality of political philosophy and innovative thinking courses to stimulate student interest

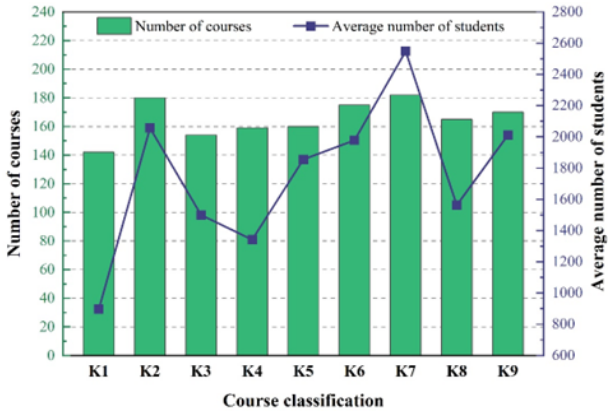

Figure 8: The course is carried out by the statistics

and potentially adjust their supply to better align with demand, thereby optimizing the overall course balance.In contrast, the supply and demand for the other courses examined appear to be relatively stable, satisfactorily meeting the demands of course delivery and student learning.

Further analysis of the coverage and course satisfaction for each major reveals that the data, presented in Figure 9, demonstrate that the average satisfaction levels for all nine course types within the integration training model in SA universities exceed 85%, while the coverage rates surpass 80%. Notably, the entrepreneurial financing course boasts the highest satisfaction rate of 98%, whereas the economic management course achieves the highest coverage rate of 95%. Conversely, marketing courses exhibit the lowest coverage rate of 81% and a satisfaction rate of 89%, suggesting that the overall quality of marketing courses lags behind and underscores the need for further improvements and developments. Collectively, the average overall satisfaction and coverage rates for SA universities adopting this paper's integrated cultivation model are 92.5% and 87.2%, respectively, indicative of commendable performance. This further underscores the efficacy of the fusion cultivation approach, grounded in innovation, entrepreneurship, and civic education, in satisfying students' demands for comprehensive course guidance.

V. Conclusion

Utilizing big data technology, this paper meticulously constructs a fusion training model that integrates innovation, entrepreneurship, and ideological education within colleges and universities. Furthermore, a comprehensive quality evaluation index system is established, which, upon application and subsequent practice, leads to the following conclusions:

1) The weights allocated to the indicators associated with the three dimensions of education and training—specifically, level, depth of integration, and breadth of training and integration—are 0.420, 0.300, and 0.280, respectively. Within these dimensions, the weights assigned to ideological-political education and innovation and entrepreneurship education are both 0.350, while the weights of the depth of the educational guarantee

	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3
A1	1										
A2	0.245*	1									
A3	0.547**	0.752**	1								
A4	0.567**	0.432**	0.243*	1							
B1	0.854**	0.453**	0.123*	0.548**	1						
B2	0.975**	0.798**	0.675**	0.354*	0.235*	1					
B3	0.678**	0.665**	0.574**	0.354*	0.354*	0.788**	1				
B4	0.548**	0.742**	0.588**	0.455**	0.488*	0.435**	0.798**	1			
C1	0.534**	0.478**	0.842**	0.654**	0.765**	0.687**	0.543**	0.862**	1		
C2	0.687**	0.783**	0.877**	0.654**	0.565**	0.754**	0.432**	0.689**	0.589*	1	
C3	0.687**	0.486**	0.985**	0.568**	0.754**	0.655**	0.348**	0.677**	0.487**	0.637**	1

Table 2: Correlation analysis results of fusion culture

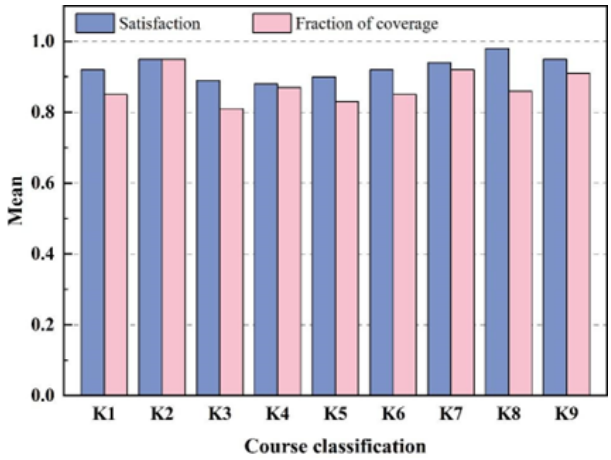

Figure 9: Course satisfaction and coverage

and the breadth of team building stand at 0.274 and 0.459, respectively. Notably, these indicators possess relatively high weights and exhibit correlations, indicating that emphasizing the level of innovation and entrepreneurship education, ideological and political education, refining the educational guarantee mechanism, and augmenting the capabilities of the teaching team, all while striving for comprehensive development, are pivotal factors in enhancing the quality of integrated education.

2) Overall, only the universities in category SA, as assessed by the methodology outlined in this paper, achieved scores exceeding 4 points across all indicators, yielding a comprehensive score of 4.511, which was the highest achieved. The respective combined scores of universities in categories SB, SC, SD, SE, and SF were 4.165, 4.298, 4.430, 4.147, and 3.944. Notably, universities in category SF exhibited the lowest comprehensive score for integrated training, falling 0.567 points short of the score achieved by universities in category SA. In comparison to other integrated training models, the integrated training mode that incorporates innovation and entrepreneurship education, as well as ideological and political education, based on big data analytics, has the potential to enhance the overall quality of training.

3) The highest number of courses conducted was observed in the field of economic management, totaling 180. Regarding the average number of learners, creative management courses yielded the highest average, with 2,548 learners. In terms of satisfaction and course coverage, the average overall satisfaction and course coverage of SA colleges and universities, as evaluated based on the fusion cultivation model proposed in this paper, were 92.5% and 87.2%, respectively. The integration of innovation and entrepreneurship education with civic education, as a training model tailored to meet the needs of course development and learning, results in relatively comprehensive course guidance, leading to favorable overall evaluations by students.

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