

Retraction

Retracted: Construction of Innovation and Entrepreneurship Education Ecosystem in Higher Vocational Colleges from the Perspective of System Theory

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/ participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity. We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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Research Article

Construction of Innovation and Entrepreneurship Education Ecosystem in Higher Vocational Colleges from the Perspective of System Theory

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Innovation and entrepreneurship (IAE) education in higher vocational education is mainly to cultivate college students' innovative spirit and ability, and it is an important way to promote economic development. However, the current academic research on the construction of IAE education ecosystem in higher vocational school (HVS) is relatively weak. In order to improve the IAE education ecosystem of HVS and strengthen the innovation of HVS education system, this study systematically discusses and analyzes the system from the four aspects of system boundary, state, power, and movement and further innovates and constructs the IAE education ecosystem of HVS on the basis of university education system, subject cooperation, and mechanism management. The results prove the feasibility of HVS IAE education ecosystem from the perspective of system theory, enhance the cultivation of HVS talents' IAE ability, and are of great significance to promote the comprehensive reform of higher vocational school education system.

1. Introduction

Innovation and entrepreneurship (IAE) education in higher vocational education is mainly to cultivate college students' innovative spirit and ability, serve the construction of an innovative country, and is an important way to promote economic development [1]. The report of the 19th National Congress of the Communist Party of China clearly puts forward, actively encourages IAE to drive employment, and helps fresh college students achieve employment and entrepreneurship [2]. Compared with general education, higher vocational education is more closely connected with industry and market and has the natural advantage of developing IAE education. Many domestic scholars began to pay attention to IAE education. Bo et al. explored the deep integration path of professional education and IAE education, hoping to realize the coordinated development of vocational education and IAE Education [3]. Dongmei took Jilin Engineering Vocational College as an example to explore the IAE education system of higher vocational school (HVS) through three

aspects: full coverage, hierarchy, and modularization [4]. IAE education of HVS is a systematic project promoted as a whole, which requires mutual cooperation and cooperation among participants, and more attention should be paid to the coupling relationship between top-level design and implementation.

With the proposal of China's education reform, the theories of integrity and systematicness in the field of ecology have been applied in pedagogy, gradually forming the theory of educational ecology and putting forward the IAE education ecosystem. The construction of the IAE education ecosystem of HVS is of great significance to IAE Education [5], but the current academic research on the construction of the IAE education ecosystem of HVS is relatively weak, As a result, the so-called educational reform is still in the exploratory stage. Shunbo and Wei explored the path of building IAE ecosystem from five system aspects based on type characteristics [6]. Yang took Sichuan Vocational College of cultural industry as an example, analyzed the necessity of building IAE education ecosystem, and summarized the specific measures of IAE education ecosystem construction of HVS [7].

With the reform of education system by social development, the construction of IAE education ecosystem of HVS is an inevitable requirement to serve the national development strategy and an inevitable trend to enhance the adaptability of vocational and technical education. This paper discusses the reform of education ecosystem.

2. Practical Problems and Available Resources for IAE Education in HVS

2.1. Practical Problems. The construction of IAE education ecological embodiment in colleges and universities is a complex main project involving many problems. As a result of efforts in recent years, the existing IAE education ecosystem of HVS in China has taken shape, but its future development still faces bottlenecks [8]. Sha analyzed the significance and existing problems of enterprise school cooperation in IAE talent training through the exploration of talent training path and believed that we should pay more attention to IAE Education [9]. Jianzhong believes that the current HVS's IAE education thinking concept is backward, the teachers are not enough, and the system is not perfect, which needs to be further improved [10]. Guofeng also believes that the current IAE education system has immature concept, imperfect management mechanism, chaotic internal structure, and insufficient fund investment [11]. Yang and Wu further improved and optimized the IAE education system from the aspects of responsibility implementation, curriculum system, teaching staff, cultural atmosphere, and establishment of practice platform and policy guarantee, so as to improve students' highquality employment and realize the high-quality development of the school [12].

In the past, the teaching methods of the normal education system in colleges and universities were jointly participated by the student department, schools, and school enterprise cooperation units in the teaching process. School support was adopted for entrepreneurship with college students. Students raised their own funds, school enterprise job fairs, and individuals took the initiative to apply online. Most students preferred employment, and the number of students who started their own businesses was relatively small.

2.2. Available Resources. The education ecosystem is a system composed of horizontal subject coordination and vertical mechanism coordination, which needs the support of the government and society through policy and resource drainage. At this time, students still do not have more resources and experience for the society. The education is more to provide guidance. Colleges and universities and teachers and students expand the output of achievements through teaching and practical training and realize the development pattern of two-way promotion. According to the viewpoint of system theory, the system is analyzed from four aspects: boundary, state, power, and motion.

2.2.1. Openness of System Boundary: Support and Output. From the perspective of the external sources of the IAE edu-

cation ecosystem of HVS, the government has issued relevant policies to guide IAE education in colleges and universities and provided financial support for IAE education in colleges and universities through financial allocation. The society provides technical support and platform support for IAE education in colleges and universities through school enterprise cooperation. From the internal perspective of the IAE education ecosystem of HVS, colleges and universities have received various external support and realized the output of innovative talents, innovative technologies, and innovative projects. Border openness is a necessary prerequisite for the internal and external exchange and resource exchange of IAE ecosystem in manuscript colleges and also determines the characteristics of system state, system power, and system movement.

2.2.2. Non Equilibrium of System State: Dissipation and Disorder. Because of the expanding boundary openness of the IAE education ecosystem of HVS, it presents a nonequilibrium state. From the perspective of dissipative structure of resource allocation, the support for IAE education of HVS is different in different regions. This "disorderly" nonequilibrium state can promote the transfer of IAE education resources in higher vocational colleges and form the power of complementary advantages and disadvantages. From the perspective of the dissipative structure of subject cooperation, due to the different value choices and professional levels of different subjects, the division of labor of IAE education in HVS is also different. This "disorderly" unbalanced state promotes institutionalized cooperative governance and efficient cooperation.

2.2.3. Nonlinearity of System Dynamics: Interleaving and Catalysis. The complexity of IAE education of HVS makes the interaction mode of factors at all levels no longer a simple linear relationship, but a spiral trajectory. When the IAE education strategy of HVS was just put forward, there was a simple linear relationship between the government, universities, and teachers and students. After promoting the cooperation between schools and enterprises and the integration of industry and education, it became a complex nonlinear relationship of multipoint cooperation among the government, universities, society, teachers, and students. In the future, with the increasing depth and breadth of participation of various subjects of HVS IAE education, the nonlinear role of this system will also be strengthened, and the effectiveness of HVS IAE education ecosystem will be brought into full play.

2.2.4. Fluctuation of System Motion: Jump and Qualitative Change. The nonlinear relationship of IAE education ecosystem of HVS makes the results of system movement show huge fluctuation. At the level of external fluctuation, the adjustment of top-level design and the change of educational environment will lead to the deviation of the internal structure of the ecosystem, and the nonlinear relationship is more significant, which promotes the IAE education of HVS to reform and adjust in depth and develop with higher quality. At the level of internal fluctuation, the change of cooperation



FIGURE 1: Main subsystem of innovation and entrepreneurship education.

mechanism and the change of teachers' and students' needs will make the internal structure of the system develop out of order, expand the nonlinear auxiliary relationship, promote the in-depth adjustment of IAE education mode and mechanism of HVS, and pay more attention to the cultivation of college students' enthusiasm, creativity, and ability.

The openness of the boundary, the nonequilibrium of the state, the nonlinearity of the dynamic, and the fluctuation of the movement are the characteristics of the IAE education ecosystem of HVS. Firstly, the openness of the system boundary is the symbol of the effectiveness of IAE education in HVS, which determines the existence and sustainable development of the system. Secondly, the greater the diversity of IAE education in HVS, the greater the intensity of reform; the key to promoting the IAE education reform of HVS is the imbalance of the system state. Thirdly, the richer the participants of the IAE education system of HVS, the more perfect its coordination system and the more scientific its mechanism; the formation source of IAE education synergy of HVS is the nonlinearity of system dynamics. Finally, the internal cause of the high-quality development of IAE education of HVS is the fluctuation of system movement. The reform and adjustment of internal and external linkage has greatly promoted the improvement of IAE education quality of HVS.

3. Innovation in the IAE Education Ecosystem of HVS

The education ecosystem is a complex system, developed from a simple system, and is a development process of orderly growth. In this process, the coordination among subjects plays a key role, which requires multidimensional coordination among subjects such as government, schools, and enterprises. This requires not only teacher sharing, project docking, resource coconstruction, and other methods but also public opinion guidance, policy support, financial investment, interest balance and so on. The structure of the IAE education subject subsystem is shown in Figure 1.

In Figure 1, the government, as the initiator, advocate, and policy maker of IAE education, defines the implementation path and objectives of IAE education through top-level design; as the main body of direct connection and implementation, the colleges and universities include entrepreneurship college, youth league committee, academic work committee, academic affairs office, research institute, laboratory, and other departments, which, respectively, undertake the roles of IAE education, teaching, guidance, and scientific research. It is necessary to specify the IAE education development plan according to the university's conditions and Cather's theory and practice courses of IAE education, so as to create an atmosphere for the development environment of IAE in colleges and universities; as the carrier and platform of IAE education, enterprises provide practice opportunities and internships for college students, provide guidance for entrepreneurship projects, and provide favorable external conditions for IAE education. The entrepreneurship park provides IAE with entrepreneurship venues, policy consultation, entrepreneurship guidance, and information services and plays a leading role in IAE education. In the process of participating in various entrepreneurial projects, college students' innovation awareness and entrepreneurial spirit have been improved, and their entrepreneurial experience has become richer and richer. Finally, their achievements have been transformed into real enterprises, providing more students with jobs and entrepreneurial opportunities.

The education system is a typical open system with certain complexity. In order to improve the IAE education system, we need to combine the overall planning of education, the optimization of policy supply and the enhancement of resource symbiosis, establish a guarantee system of external subject coordination and internal department linkage to ensure policy implementation resources, determine the training level and content, and adjust and supplement the talent training plan, through the combination of all aspects of the system to achieve the training goal. The IAE education talent training system is shown in Figure 2.



FIGURE 2: The whole system promotes the government, colleges and universities, enterprises, society, and academic circles to form school local coordination, encourages the government and enterprises to participate in the education platform of colleges and universities, carry out strategic planning and establish effective institutional mechanisms to form a security system, so as to carry out general education, characteristic education, and practical education, determine the training level and refine various training contents, so as to achieve the training goal of promoting vocational ability, comprehensive quality, and all-round development of higher vocational students and feedback the results through the evaluation system.

4. Teaching Experiment and Test Results

4.1. Basic Information of Students and Teaching Grouping. In order to increase higher vocational students' all-round cognition of IAE ecological education system, 2000 graduates of a HVS in 2020 and 2021 were randomly investigated in groups. The graduates in 2020 were a group of normal higher vocational education, with an average of 18.5-20 years old, 1245 boys and 755 girls. The higher vocational students in 2021 are another group receiving IAE education system, with an average age of 18-20.6 years, 1087 boys and 913 girls.

4.2. Teaching Methods and Teaching System. The graduates in 2020 adopt the teaching methods of the normal education system of colleges and universities. In the teaching process, the student department, schools, and school enterprise cooperation units jointly participate in the school support for entrepreneurship with college students. Students raise funds by themselves, and school enterprise job fairs and personal active online recruitment. Most students give priority to employment, and the number of students who start their own businesses is relatively small.

In 2021, the graduates adopted the teaching method of HVS IAE ecological education system. During the teaching process, they reformed the previous education system, sought various educational preferential policies to provide financial support for students, and greatly improved the students' active learning habits in the way of combining teaching theory with practice. The school will provide guidance and support in many aspects to graduates with innovative and entrepreneurial ideas and encourage students to participate in independent entrepreneurship.

4.3. Observation Contents and Statistical Methods. For the two groups of students in 2020 and 2021, observe the mass entrepreneurship and innovation education under the reform education, investigate and count the cognition of

the education system, the entrepreneurial scale and entrepreneurial success rate of the two groups of students, and evaluate the results of systematic application.

Among them, in the application of the teaching system, the arithmetic mean and standard deviation rate method in statistics and the bivariate *t*-test method need to be used for statistical analysis in the calculation of students' entrepreneurial results. The arithmetic mean and standard deviation rate are shown in formula (1)

$$\sigma = \frac{1}{n-1} \sqrt{\sum_{i=1}^{n} (x_i - \mu)^2}, \ \mu = \frac{1}{n} \sum_{i=1}^{n} x_i, \tag{1}$$

where σ is calculation result of standard deviation rate of input sequence *x*, *n* is the number of elements of the input sequence *x*; μ is the arithmetic mean of the input sequence *x*.

The bivariate t verification method is shown in formula (2)

$$t = \frac{\mu_1 - \mu_2}{\sqrt{(n_1 - 1)\sigma_1^2 + (n_2 - 1)\sigma_2^2/n_1 + n_2 - 2\bullet((1/n_1) + (1/n_2))}},$$
(2)

where \bar{x} is the arithmetic mean of the sample series of IAE education system; μ is the average value of the sample series of IAE education system, and *t* is the result of bivariate *t*-test.

5. Discussion on Teaching Experiment Results and Achievements

5.1. Investigation on Students' Basic Cognition. Through the relevant investigation on the IAE education ecosystem of HVS students, it is found that a small number of students have very limited understanding of the IAE education system and need the promotion and publicity of the school. After accepting the IAE education ecosystem, most students

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Grouping/year	Number of graduates	Entrepreneurship priority	Work priority	Public recruitment	Other
2020	2000	485 (24.2)	530 (26.5)	495 (24.75)	490(24.5)
2021	2000	735 (36.75)	610 (30.5)	427 (21.35)	228(11.4)
t value		8.429	9.034	9.127	8.926
P value		0.007	0.009	0.008	0.007

TABLE 1: Questionnaire on entrepreneurial cognition of higher vocational students.



FIGURE 3: Visualization of students' IAE cognitive survey results.

take the initiative to strengthen the learning of education methods and teaching contents. Various optimization policies are also being applied and well utilized. With the innovative application of the IAE education system, higher vocational students preparing to start a business are very confident in the prospect of entrepreneurship. The investigation on students' entrepreneurial cognition of a HVS in 2020 and 2021 is as shown in Table 1.

Table 1 shows that in the survey on entrepreneurship awareness of HVS students in the same number and different years, the number of graduates in 2020 gives priority to employment, followed by the industries of public recruitment and independent entrepreneurship. In 2021, after the students who accepted the IAE education system of colleges and universities made effective use of educational reform and innovation and preferential government subsidies, the number of students who chose to give priority to entrepreneurship increased significantly, followed by the students who chose to give priority to work and participate in public recruitment.

By visualizing the cognitive survey results of the same number of students in the HVS in 2020 and 2021 in terms of IAE, Figure 3 is obtained.

In Figure 3, it is obvious that the proportion of entrepreneurial students who accept the application of IAE education system in 2021 is significantly higher than that in 2020, indicating that the application of IAE education system can be recognized by most students and improve the number of entrepreneurs of higher vocational students, which is worthy of being popularized and applied in HVS.

TABLE 2: Statistics of student entrepreneurship scale and success rate.

Year/yuan	20000	40000	60000	100000
2020	21.4 ± 4.3	16.4 ± 3.5	11.2 ± 5.1	6.3.±5.1
2021	35.2 ± 2.7	32.6 ± 2.9	22.5 ± 4.7	12.4 ± 4.3
t value	9.561	8.687	9.104	9.002
P value	0.007	0.009	0.008	0.009

20000 element.

5.2. Student Entrepreneurship Scale and Success Rate. The HVS college students choose to start a business after graduation every year, accounting for about 5% of the number of graduates in the same year, but the success rate of students' entrepreneurship only accounts for about 3% of the 5%. The above data show that the success rate of students' entrepreneurship is very low and in an obvious form of success weakness. Although students' independent entrepreneurship accounts for a large proportion, few can succeed in independent entrepreneurship without the support of policies of colleges and universities and social parties, according to the investigation and statistics on the entrepreneurial scale and entrepreneurial success power of fresh graduates of a higher vocational college in 2020 and those who received IAE education ecosystem in 2021, see Table 2.

Table 2 shows the success rate of HVS graduates in 2020 and 2021 with different entrepreneurship funds such as 20000 yuan, 40000 yuan, 60000 yuan, and 100000 yuan, and the IAE education ecosystem in 2021, the success ratio



FIGURE 4: Visualization of statistical results of entrepreneurship scale and success rate of higher vocational students.

Serial number	Educational ecology system index	PCA weight	AHP weight	Entropy weight
1	Education system	0.038	0.054	0.152
2	Mechanism management system	0.046	0.061	0.067
3	Subject cooperation system	0.063	0.076	0.075
4	School teaching philosophy	0.065	0.068	0.059
5	School teaching methods	0.071	0.059	0.049
6	Teaching content system	0.040	0.054	0.162
7	Teaching platform system	0.072	0.061	0.042
8	Teaching practice system	0.057	0.054	0.034
9	Organization and coordination model	0.061	0.056	0.047
10	Education fund support	0.050	0.052	0.054
11	Education policy support	0.027	0.037	0.123
12	Educational environment support	0.048	0.053	0.050
13	School enterprise cooperation support	0.062	0.058	0.065
14	Achievement transformation system	0.068	0.064	0.037

TABLE 3: Index weight of IAE education ecosystem in higher vocational colleges.

of entrepreneurial students in different entrepreneurial scales was significantly higher than that in 2021, and the survey results were t < 10.000 and P < 0.01, through the visual chart of the survey and statistics results of different entrepreneurial scale and entrepreneurial success rate of higher vocational graduates in 2020 and 2021, as shown in Figure 4.

Figure 4 shows that the graduates of higher vocational education in 2021 have received various preferential policies of IAE education system, various entrepreneurship models, and relevant support of entrepreneurship funds. The entrepreneurship scale and success rate have increased significantly, which improves the students' entrepreneurial enthusiasm and success rate, and can promote the sustainable development of HVS and socioeconomic market.

5.3. Discussion on Teaching Test Results. After the establishment of HVS IAE education ecological index system, it is also necessary to evaluate the index weight reasonably. Weight is an important index system for the comprehensive evaluation of the system. The key of index weight is how to reasonably allocate weight for quantitative evaluation The accuracy and objectivity of the weight of each evaluation index directly affect the scientificity of the evaluation. Therefore, when allocating the weight of the system index, the statistical law and authoritative value between the system index data should be considered. The index weight of the system is shown in Table 3.

Table 3 shows that the weight indicators of the system are quantitatively evaluated by objective weighting method

(PCA), subjective weighting method (AHP), and entropy weight method. The PCA weight is a statistical method to investigate the correlation between variables. This method uses the principle of data information concentration and has the characteristics of objective weight. The AHP weight is a hierarchical model that builds the decision-making problem according to the order of overall goal, subgoals, and evaluation criteria. It is the weight of each index to the overall goal and has the characteristics of subjective weight. The entropy weight method determines the objective weight according to the variability of the index. Generally, the smaller the information entropy of an index, the greater the variability of the index value, the more information it provides, and the greater the role and weight it plays. Considering the advantages and disadvantages of the three methods, AHP, PCA, and entropy method are optimized. According to the subjective weight, objective weight, and entropy weight obtained from each index of HVS IAE education ecosystem, the geometric mean is recalculated and normalized, and the final weight results affecting each index of HVS IAE education ecosystem can be obtained.

In the application of the above index data, the result formula of the normalization algorithm is shown in (3) as follows:

$$y_i = \frac{x_i - \min(x)}{\max(x) - \min(x)},$$
(3)

where y_i is the output item corresponding to the *i* input item; min (*x*) is the minimum value in the input sequence *x*; and max (*x*) is the maximum value in the input sequence *x*.

In the research on the construction of HVS IAE education ecosystem from the perspective of system theory, after analyzing the current practical problems and available resources, ptimize and innovate the HVS IAE education ecosystem, such as IAE education subject subsystem and IAE education talent training system, and conduct teaching experimental research and analysis according to the specific situation of higher vocational students and teaching method system. The results show that the students' cognitive effect of IAE education in the basic cognitive survey is better, and the entrepreneurial scale and success rate are also significantly improved [13].

In the ecological education system, optimize the subjective weight and objective weight and come to the conclusion that effective education methods and scientific courses are an important part of the IAE education ecosystem of HVS. The combination of teaching theory and practice platform will form a new innovation and entrepreneurship education system supported by various policies and promote the development of the education level of HVS, effectively stimulate and cultivate students' entrepreneurial spirit and innovation potential.

6. Summary

With the continuous development and progress of various forms of education, HVS's education system also needs to strengthen innovation and integrate with other special edu-

cation to form an education ecosystem in the new era [14]. Constructing HVS IAE curriculum education ecology from the perspective of system theory can stimulate the innovative consciousness of college students, make use of the relevant characteristics of HVS and students, and combine the ability of college IAE education ecology theory and practice to effectively form HVS diversified ecological education system. Based on the university education system, subject cooperation, and mechanism management, this study draws lessons from the system theory as the integration of education system theory and practice to build the HVS IAE education ecosystem system. The IAE education system is gradually improved through the basic characteristics and structural levels of ecological education. According to the needs of colleges and students, the subjective weight and objective weight indicators are combined and optimized in the education ecosystem to obtain the comprehensive weight index results of the IAE education ecosystem. The results prove the feasibility of HVS IAE education ecosystem from the perspective of system theory, enhance the cultivation of HVS talents' IAE ability, and are of great significance to promote the comprehensive reform of higher vocational school education system. In the future practice, the IAE curriculum education ecology of HVS still has great prospects to be further developed.

Data Availability

The data underlying the results presented in the study are available within the manuscript.

Disclosure

We confirm that the content of the manuscript has not been published or submitted for publication elsewhere.

Conflicts of Interest

There is no potential conflict of interest in our paper, and all authors have seen the manuscript and approved to submit to your journal.

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