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Retraction

Retracted: Assessment of College Entrepreneurship and Innovation Education Effect for Sci-Tech Service Industry

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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) Manipulated or compromised peer review

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.

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.

References

[1] Y. Chang and Y. Liu, "Assessment of College Entrepreneurship and Innovation Education Effect for Sci-Tech Service Industry," *Discrete Dynamics in Nature and Society*, vol. 2022, Article ID 8037934, 12 pages, 2022.

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Research Article

Assessment of College Entrepreneurship and Innovation Education Effect for Sci-Tech Service Industry

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Based on the analysis of the importance and necessity of evaluating the college entrepreneurship and innovation (E&I) education effect for the sci-tech service (STS) industry, from four aspects of top-layer design, college environment, faculty and learner assessment, an assessment index system for the effect of college E&I education is constructed. Through analytic hierarchy process (AHP), this paper also makes a comprehensive and objective assessment and analysis on the effect of college E&I education, which is oriented to the STS industry. Among the primary layer indicators, the weight coefficient of learner assessment is 0.4444, followed by the faculty, and the weight coefficient is 0.3061. Additionally, this proves that lecturers and learners are the focus and primary body of E&I education activities in colleges for STS industry. The theoretical concept and practical ability of learners is the most important index to test the assessment of E&I education effect. Lecturers' teaching methods and their own experience are important for the effect assessment of E&I education, and the environment of E&I education is important for the effect assessment of education. The construction of innovative and entrepreneurial lecturers is critical to education effect assessment.

1. Introduction

As a new industry derived from knowledge intensive economy, STS industry has its unique training requirements for talent training mode. Information technology has gradually become the driving force of the great adjustment of industrial structure and the smooth transition of economy in the era of service economy. In the era of service economy, human capital is still an important element of economic progress [1–3], the development of STS industry needs high-quality talents, and all the service industry in developed countries are necessary to improve the quality of workers in this industry [4–6]. Therefore, we will strengthen the training of a team of innovative talents who integrate knowledge, innovation, skills, and cooperation into a comprehensive STS innovative talent team, which is target to the deepening of talent training and education and teaching reform in colleges. College E&I education is an important reform measure taken by education in the world to actively adapt to economic and social development. It is the trend of development in the field of international education [7–9]. Some domestic colleges began to reform and innovate the training mode in order to cultivate STS innovative talents to meet the needs of social development with service economy and knowledge economy as the main body.

Chinese colleges still adopt two basic models in talent training, namely general education model and specialized education model [10–12]. General education is mainly aimed at cultivating learners with the characteristics of self-motivation, self-innovation, profound knowledge, rigorous thinking, and noble sentiment. Professional education is mainly aimed at cultivating full-time talents. It focuses on cultivating learners' practical ability to work. The talents they cultivate have irreplaceable characteristics in the short term and other issues, which would hinder the future growth of learners. Obviously, learners under the traditional talent training model can no longer meet the needs of social development under the leadership of the service economy and

knowledge economy. In addition, due to the leap-forward development of some colleges under the promotion of national policies, these colleges blindly pursue the improvement of the school-running layer, and are tied down by the traditional complicated of elite education. As a result, the learners do not have strong sense of scientific and technological service, nor the skills to serve the economic and social development. For college learners in the economic transition period, the STS industry is an industrial field with broad prospects for employment and entrepreneurship [13, 14]. Enhancing the technical skills and management service capabilities of college learners to control the technology service industry is an inevitable choice for college entrepreneurship and innovation (E&I) education.

As a new international trend of educational concepts and models, E&I education has attracted widespread attention from all over the world, and has gradually become an important part of modern education, especially higher education [15–17]. In contrast to conventional education model and the E&I education system of other types of universities, the uniqueness of E&I education for colleges in the STS industry mainly manifests in the following dimensions. First, pay more attention to the training of learners' awareness of E&I, and guide learners to change from job seekers who "passively adapt to the society" to builders who "actively adapt to and even challenge the society." Secondly, emphasize the development of a series of curriculum systems. For the content of E&I, courses such as entrepreneur training, entrepreneurial planning and management, new enterprise creation and innovation, new business development, innovative activity management, emerging enterprise financing, and enterprise growth strategies are offered. Thirdly, focus on enabling learners to gain more perceptual experience through imitation and other practical forms. Through the establishment of various E&I program and competitions, learners are fully exposed to the whole process of innovation and the fun and meaning of entrepreneurship in practice. Fourthly, it is supported by solid academic research. There are various innovation research centers or entrepreneurship centers and other institutions to provide a platform for academic basic research on cutting-edge topics. Finally, it directly induces the E&I activities of lecturers and learners. It can provide lecturers and learners with innovative directions and ways to improve the creation rate of new companies, so as to make greater contributions to economic development.

In the early 1980s, the trend of E&I education for the STS industry was introduced to China from the West, and many regions began to establish pilot schools for E&I education for the STS industry. The concept of E&I in the industry has not yet taken shape, and its promotion work has not achieved good results. Education effect assessment and monitoring is particularly important currently. The traditional education effect assessment system is not suitable for the E&I education model. Its index system is not scientific enough, the assessment standards are uniform and rigid, and the assessment methods are relatively backward. Therefore, how to establish a scientific index system and assessment model method according to the training objectives of E&I, comprehensively supervise the two-way process and performance of teaching and learning of E&I education, and regulate and guide the faculty through effective assessment and testing. It is of high necessity to effectively promote the implementation and operation of E&I education, and to improve the overall performance of research universities, and has become a topic worthy of research.

The research in China on the effect assessment system of E&I education for the STS industry is still in its infancy. The current results mainly focus on explaining the necessity of effect assessment from the aspects of the direct and indirect influence of E&I education on the economy and society, the time cost and opportunity cost of educational institution investors and educated people, etc. [18, 19]. The representative point of view on the construction of the assessment system is that the influence of E&I education is lagging and should be assessed longitudinally. Its assessment index system should reflect the characteristics of the industry, reflect the lecturer's E&I teaching ability, the grasp of teaching links and the assessment needs of teaching effects. Personal and environmental elements are the primary indicators to examine, such as the number of courses offered, the works of lecturers, the influence on society, the number of learners and graduates who build or join startup companies, and the innovations caused by entrepreneurship education. In addition, some people believe that the degree to which higher education adapts to and meets the needs of society is the basic standard for evaluating the effect of higher education services. Therefore, the effect assessment system of E&I education should gradually shift from the government as the primary body to the society as the primary body, and let the society participate to monitor and assess the effect of education. In addition, it should be assessed from the two primary aspects of investment in E&I education and its influence.

In the existing research on the effect assessment of E&I education in China, there is a lack of in-depth quantitative research, and the paradigm of assessment theory and the regulation of assessment system are still immature. The basic theoretical research such as the elaboration of nature is transformed into the principle, mode, method, and path exploration of the construction of the practical system of assessment work. This paper draws on the research results of foreign E&I education effect assessment, and uses the Analytic Hierarchy Process (AHP) assessment model and method to discuss the connotation and characteristics of E&I education for the technology service industry. It also conducts in-depth quantitative research on the assessment index system, assessment model and method, and provides scientific reference and reference for the research on the effect assessment system of college E&I education of China for the STS industry.

2. Selection and Establishment of AHP Model

2.1. Model Selection. E&I education is a step-by-step and dynamic education that runs through the whole process of cultivating talents. It lacks certain rigor and scientificity to assess the effect of E&I education solely by human subjective

judgment. If people want to assess through data, some elements cannot be expressed quantitatively. In the early 1970s, Saaty proposed the AHP in order to be able to carry out systematic and qualitative analysis and quantitative analysis of complicated issues. This method can divide the elements in complicated issues in a sequential and layered manner, and then organize the interrelated elements. It is a decision-making method for quantitative analysis of qualitative issues. It has been introduced into China since 1982. Since then, it has been widely used in energy policy analysis, development strategic planning, economic management research, scientific and technological achievement assessment, talent assessment and other fields. It has been widely valued and applied. Many intertwined elements are covered by the effect assessment of E&I education. Many of them could not be quantified easily. Therefore, it is scientific and applicable to use the AHP to assess the effect of E&I education.

The AHP integrates quantitative and qualitative analyses deeply to deal with complicated issues, fully considers the objective judgements of experts, and emulates the thinking process of decision-makers. This advantageous method is easy to understand and implement.

2.2. The Basic Principles and Steps of AHP Method. The AHP aims to divide the various elements contained in complicated issues into several sequential layers, and use the structure chart to show the relationship between these elements. For each layer, the relative importance of the elements on this layer is judged according to the criteria, that is, pairwise comparison, by solving the matrix eigenvalue issue, to determine the weight order of the elements, and finally to compute the total weight of the elements of each layer to the overall goal and provide a quantitative decision-making basis.

The primary steps of the method are: First, according to the layered division of each related element involved in the issue to be solved, a layered model composed of the goal layer, the rule layer and the alternative layer is formed. Second, using the mathematical method of comparison matrix and matrix operation, the elements of the same layer are compared in pairs, the relative weights are computed, and the relative importance of each element is judged. Third, test the consistency of the comparison matrix to assure that the AHP results are scientific and rational. Lastly, compute the composite weight of each layer element to the goal layer element, and sort to make the corresponding decision.

2.3. The Establishment of AHP Model. Build a hierarchy diagram: all the elements involved in the issue are arranged layer by layer from the top layer to the bottom layer according to their mutual relationship. The highest layer, that is, the goal layer, represents the final issue to be solved; the middle layer, that is, the rule layer, indicates that a certain measure or an intermediate link involved in achieving a predetermined goal according to a certain rule can be multilayered; the bottom layer, that is, the solution layer represents the measures and solutions to solve the issue (Figure 1).

Construct Comparison matrix: in order to quantify the judgment, the AHP method adopts the 9-point scale to quantify the levels of different scenarios (Table 1).

Construct the comparison matrix $[A]$ of layer B relative to layer $[A]$:

$$A = \left(a_{ij}\right)_{n\times n} = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{bmatrix}, \quad \left(a_{ij} = \frac{1}{a_{ji}}\right). \tag{1}$$

Data consistency check. Through the survey $A = (a_{ij})_{n\times n} = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{bmatrix}$, $(a_{ij} = (1/a_{ji}))$, the comparison matrix of each respondent can be obtained. However, due to the diversity of subjective judgements of each respondent, to rigorously judge the weight of each element, it is important to conduct a data consistency test, and the survey data that has not passed the one-time test will be removed. The specific methods are as follows: (1) Let each respondent independently conduct comparative assessment according to the regulations, and list the comparison matrix. (2) Compute the mean of the respondents' judgment results and normalize them. (3) Compute the greatest characteristic root of the comparison matrix, and judge the consistency of the matrix. The square root method was adopted as follows:

Multiply the elements in Formula (1) by rows to obtain:

$$M_i = a_{i1} \times a_{i2} \times \cdots \times a_{1i}, \quad (i = 1, 2, \ldots, n). \tag{2}$$

Take the n^{th} root of M_i and get formula (3):

$$\overline{W_i} = \sqrt[n]{M_i}. \tag{3}$$

Normalize the obtained square root vector $\overline{W_i}$ to obtain the eigenvector W:

$$W_i = \frac{\overline{W_i}}{\sum_{i=1}^{n} \overline{W_i}}. \tag{4}$$

The $(AW)_i$ in Formula (5) is the i^{th} component of the vector.

The largest characteristic roots $\lambda_{\max}$ can be computed by the following formula:

$$\lambda_{\max} = \sum_{i=1}^{n} \frac{(AW)_i}{(nW)_i}. \tag{5}$$

Compute consistency index $C.I.$:

$$C.I = \frac{\lambda_{\max} - n}{n - 1}. \tag{6}$$

Then, the mean random consistency index $R.I.$ of the same order is searched (see Table 2), and the random consistency ratio $C.R.$ of the comparison matrix is computed.

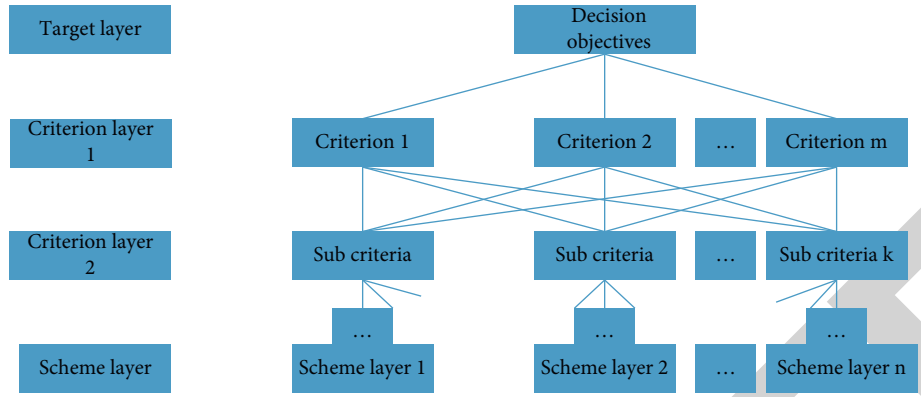

Figure 1: AHP hierarchy structure diagram.

$$C.R = \frac{C.I}{R.I}. \tag{7}$$

When $C.R.\leq 0.10$, the comparison matrix is consistent; otherwise, it needs to be adjusted.

Total sorting. The sorting process of determining the relative importance of every element in a layer to the overall goal is called total sorting. The weight vector of a set of elements to an element in the upper layer is computed and the resultant weight is determined by the bottom-up rule. Suppose that there are k elements in layer A, and there are n elements in layer B of the next layer. B_{1j}, B_{2j}, $\cdots$, B_{nj} represents the single sorting weight of layer B to layer A (see Table 3).

By integrating the weight matrix of each layer, the weight vector W of each layer's element layer to the overall goal is:

$$W_n^1 = \prod_{2}^{i=n} W_n^{n-1} = W_n^{n-1} \cdot W_{n-1}^{n-2} \cdots W_3^2 \cdot W_2^1. \tag{8}$$

Note: Total sorting still requires consistency testing. The total sorting can be computed by YAAHP software.

3. Construction of Effect Assessment Index System for College E&I Education of STS Industry

3.1. Determination of Assessment Index. College E&I education for the STS industry is a complicated project in which the government, schools and social organizations operate collaboratively. There are many influencing elements, and it is difficult for a single-dimensional assessment system to summarize and measure it comprehensively and objectively. The content is regarded as the form of value realization of the elements of the system, and they are related to each other. The form of "element and relationship" is used to make a feasible and easy-to-operate objective expression. Combined with the layer, characteristics, objectives, content, structure, etc. of college E&I education, and at the same time considering the influence of learners' family background, personal features, and the E&I environment of colleges on the education system, the following aspects are mainly involved in the design of comprehensive assessment index system.

Table 1: Meaning of relative importance comparison degree [20, 21].

Level	Meaning
1	Equal importance
3	Slightly greater importance
5	Moderately greater importance
7	Strongly greater importance
9	Very strongly greater importance
2, 4, 6, 8	Reciprocals

(1) Government level: the government plays an important role in guiding and supporting college E&I education. The government level mainly includes increasing fund investment, issuing relevant preferential incentive policies to actively guide the innovation and entrepreneurship education of colleges and universities, establishing special education management organizations, and formulating corresponding management systems and measures to actively guide and manage students' E&I activities.

(2) College level: it includes three aspects. First, college environment: the environment reflects the organizational support and resource investment provided by colleges for E&I education, mainly including hard environment and soft environment. Hard environment refers to various material guarantee measures taken by the school in terms of E&I funds, infrastructure and other material aspects; Soft environment refers to the academic atmosphere and culture in which the school encourages innovation, advocates entrepreneurship and tolerates failure, stimulates students' innovative and entrepreneurial spirit and enthusiasm through relevant policies and measures, and provides an internal guarantee for E&I education. Secondly, teaching staff: college E&I education is ultimately implemented through teachers. Therefore, the teaching staff is an important factor in the evaluation of education quality, which mainly includes: teacher background, that is, the basic conditions such as academic title, professional knowledge, quality skills and work experience that college teachers should have for E&I education,

Table 2: The mean random consistency index [22, 23].

Order	2	3	4	5	6	7	8	9	10	11	12	13	14
Random consistency index	0	0.52	0.86	1.10	1.26	1.34	1.40	1.43	1.49	1.51	1.54	1.56	1.58

Table 3: Total sorting table.

Layer A	A_1	A_2	...	A_k	Layer B total sorting
Layer B	a_1	a_2	...	a_k	
B_1	b_1^1	b_1^2	...	b_1^k	$\sum_{i=1}^{k} a_i b_1^i$
B_2	b_2^1	b_2^2	...	b_2^k	$\sum_{i=1}^{k} a_i b_2^i$
			...		
B_m	b_m^1	b_m^2	...	b_m^k	$\sum_{i=1}^{k} a_i b_m^i$

$(W^{(j)})^T$

including teachers' political quality, professional and intellectual qualities and ability quality are the key points of evaluation; Teachers' E&I ability, that is, teachers' scientific research and innovation consciousness, ability and related achievements; Teachers' E&I teaching ability is the ability to master and implement the E&I education theory and teaching methods. Thirdly, teaching links: teaching is the implementation link of E&I education. Through innovation in curriculum content and form, students' E&I ability can be improved. The main evaluation aspects are: discipline construction, that is, the design and arrangement of relevant theories and practical courses such as entrepreneurial consciousness, knowledge, strategy, ability and quality; In addition to the traditional classroom, teacher and textbook teaching, teaching methods should also add social investigation, case analysis, lecture interaction, entrepreneurship simulation and business practice.

(3) Student level: college E&I education aims to cultivate comprehensive talents who adapt to the development of the era of knowledge economy and improve students' E&I ability. As the object of E&I education, students' performance is the direct manifestation of the effect of E&I education, mainly including students' scientific research ability, innovation achievements, entrepreneurship rate and participation in E&I education practice activities, such as the number and times of scientific research, the distribution of scientific research achievements, innovative works and the performance of winning prizes in competitions; Student quality mainly includes students' own background, performance and their satisfaction with the E&I system. Among them, students' background refers to their family background, educational experience, concept consciousness, personality quality, ability quality and other information for E&I; Students' performance refers to their achievements in innovation, entrepreneurship, learning and practice; Student satisfaction refers to students' sense of identity, initiative and participation in E&I education courses and methods.

(4) Social dimension;

society is a powerful support for E&I education, mainly including social reputation and social atmosphere, that is, the approval and recognition of E&I education by the society and the E&I atmosphere formed by the whole society. It mainly refers to the social influence and academic status of college in the field of E&I; Whether social groups and business organizations actively support the college E&I activities and provide service support; A series of academic connections and achievements in external innovation; The results of graduates' E&I.

Taking the above evaluation contents as the main line and referring to the literature [24–28] on the construction of assessment index system of college E&I education for STS industry, the assessment system of college E&I education for STS industry effect is screened by expert investigation method from the perspectives of result evaluation and process investment (see Table 4). The system includes 4 primary layer indicators (criterion layer): the top-layer design (including national policies and training systems), the college environment (including entrepreneurial activities and entrepreneurial bases), the faculty (including theoretical teaching, lecturer construction) and learner assessment (including theoretical concepts, ability practice), marked with Y_1, Y_2, Y_3, and Y_4, respectively; 8 secondary layer indicators (Sub criterion layer): national layer, culture system, entrepreneurial base, entrepreneurial activities, lecturer construction, theoretical teaching, practical ability, and theoretical concept, marked with Z_1 to Z_8; There are 21 elements in the scheme layer, including incentive measures, curriculum, and learning ability, marked with N_1 to N_{21}.

Table 4: Effect assessment system of college E&I education for STS industry.

Target layer (total index)	Criterion layer (primary layer index)	Subcriterion layer (secondary layer index)	Scheme layer (tertiary layer index)
Effect assessment system of college E&I education for STS industry X	Top-layer design Y_1	National layer Z_1	Incentive measures N_1
		Culture system Z_2	Teaching content N_2 curriculum N_3
	College environment Y_2	Entrepreneurial base Z_3	Supporting equipment N_4
			Number of hatches N_5
			Fund input N_6
		Entrepreneurial activities Z_4	Entrepreneurship lecture hall N_7
			Competition platform N_8
			Entrepreneurial community N_9
	Faculty Y_3	Lecturer construction Z_5	Practical experience N_{10}
			Lecturer team N_{11}
			Qualification certificate N_{12}
		Theoretical teaching Z_6	Assessment method N_{13}
			Teaching methods N_{14}
			Teaching skills N_{15}
	Learner assessment Y_4	Practical ability Z_7	Learning ability N_{16}
			Entrepreneurial practice N_{17}
			Participate in activity N_{18}
			Entrepreneurial intention N_{19}
		Theoretical concept Z_8	Theoretical knowledge N_{20}
			Entrepreneurial consciousness N_{21}

3.2. Index Weight Calculation and Consistency Check. In order to avoid the subjective characteristics of AHP analysis method, according to the constructed assessment index system, 7 A-level Chinese universities were used as case studies and survey data is used to obtain weights. The respondents selected for this survey are teaching experts and lecturers from the School of E&I from 7 universities. The data is weighted and averaged to form a comparison matrix. According to the expert survey method, a survey and consultation form was distributed to 10 responsible E&I education experts in the industry, and the survey and consultation were carried out. According to their own experience and knowledge and the scale table in Table 1, the experts obtained the comparison matrix through the comparison of elements and elements. The total index matrix is as follows (Table 5).

According to Formula (1), we can get X:

$$X = (x_{ij})_{4\times4} = \begin{bmatrix} 1 & 1/2 & 1/3 & 1/5 \\ 2 & 1 & 1/3 & 1/2 \\ 3 & 3 & 1 & 1/2 \\ 5 & 2 & 2 & 1 \end{bmatrix}.$$

Then, the value of M can be computed by Formula (2): $M_1 = 1 \times 1/2 \times 1/3 \times 1/5 = 0.0333$, $M_2 = 0.3333$, $M_3 = 4.5$, $M_4 = 20$.

The feature vector W is computed by Formulas (3) and (4): $Y_1 = 0.0898$, $Y_2 = 0.1597$, $Y_3 = 0.3061$, $Y_4 = 0.4444$.

The biggest characteristic roots $\lambda_{\max}$ can be computed by Formula (5): $\lambda_{\max} = 4.1121$.

According to Formulas (6) and (7), we compute the result of $C.R.: C.R. = 0.0415 < 0.10$, which can pass the consistency test, thus judging that the consistency of the matrix is good and acceptable.

Similarly, we test the consistency of primary layer and secondary layer index,where *C.R.* of the primary layer index matrix is $Y_1 = 0.0010$, $Y_2 = 0.0021$, $Y_3 = 0.0217$, and $Y_4 = 0.0406$.

C.R. of the secondary layer index matrix is $Z_1 = 0.0000$, $Z_2 = 0.0105$, $Z_3 = 0.0017$, $Z_4 = 0.0432$, $Z_5 = 0.0378$, $Z_6 = 0.0762$, $Z_7 = 0.0970$, and $Z_8 = 0.0611$.

Therefore, the consistency between primary layer and secondary layer index is good and acceptable.

In the calculation of AHP index weight, YAAHP software is used to summarize the index weight of single sorting and total sorting of AHP model. The relevant results are recorded in Table 6.

3.3. Analysis of Assessment Results. According to the weight coefficients of the primary layer index, secondary layer index and tertiary layer index of the E&I education effect assessment index system for colleges for the STS industry, the distribution of each index can be known (see Figures 2–4).

According to Figures 2–4, among the weights of the primary layer index, the learner assessment (Y_4) has the largest weight on the assessment of college E&I education effect facing the STS industry, which is 0.444, followed by the faculty (Y_3), and the college environment (Y_2). The weight coefficient of top-layer design (Y_1) is the lowest, and the corresponding weight coefficients are 0.3061, 0.1597 and 0.0898 respectively. The weights of secondary layer index for

Table 5: Comparison matrix of total index in the assessment index system.

X	Y_1	Y_2	Y_3	Y_4
Y_1	1	1/2	1/3	1/5
Y_2	2	1	1/3	1/2
Y_3	3	3	1	1/2
Y_4	5	2	2	1

Table 6: Index weight coefficient of single sorting and total sorting of assessment index layer of E&I education effect in colleges.

Total index	Primary layer index	Secondary layer index	Single sorting weight coefficient of tertiary layer index	Total sorting weight coefficient of tertiary layer index
		Z_1 (0.3200)	N_1 (1.000)	N_1 (0.0295)
	Y_1 (0.0898)	Z_2 (0.6800)	N_2 (0.6500)	N_2 (0.0405)
			N_3 (0.3500)	N_3 (0.0222)
			N_4 (0.2230)	N_4 (0.0108)
		Z_3 (0.2791)	N_5 (0.3081)	N_5 (0.0146)
	Y_2 (0.1597)		N_6 (0.4689)	N_6 (0.0217)
			N_7 (0.2117)	N_7 (0.0251)
		Z_4 (0.7209)	N_8 (0.6052)	N_8 (0.0705)
			N_9 (0.1831)	N_9 (0.0219)
			N_{10} (0.6665)	N_{10} (0.0872)
X		Z_5 (0.4234)	N_{11} (0.1926)	N_{11} (0.0258)
			N_{12} (0.1409)	N_{12} (0.0192)
	Y_3 (0.3061)		N_{13} (0.1306)	N_{13} (0.0055)
		Z_6 (0.5766)	N_{14} (0.6007)	N_{14} (0.1068)
			N_{15} (0.2687)	N_{15} (0.0482)
			N_{16} (0.2613)	N_{16} (0.0648)
		Z_7 (0.5505)	N_{17} (0.0801)	N_{17} (0.0204)
	Y_4 (0.4444)		N_{18} (0.6586)	N_{18} (0.1619)
			N_{19} (0.2406)	N_{19} (0.0489)
		Z_8 (0.4495)	N_{20} (0.2088)	N_{20} (0.0426)
			N_{21} (0.5506)	N_{21} (0.1108)

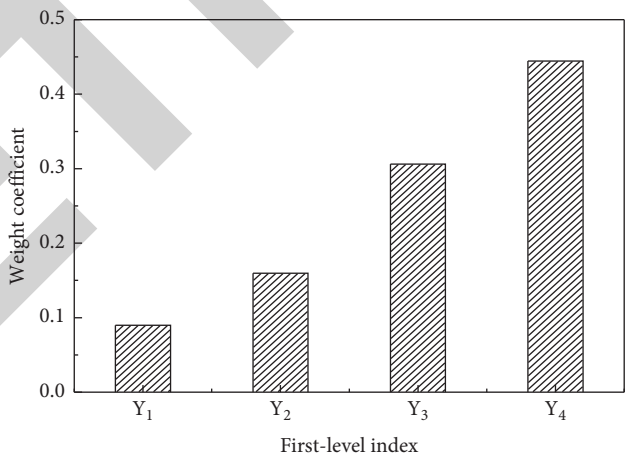

Figure 2: The weight coefficient of primary layer index on the assessment of college E&I education effect.

the assessment of college E&I education effect are, from high to low, learners' practical ability (0.2446), learners' theoretical layer (0.1996), lecturers' theoretical teaching effect (0.1765), the holding of entrepreneurial activities (0.1154), the entrepreneurial lecturer construction (0.1296), the E&I training system (0.0610), the construction of entrepreneurial bases (0.0446) and the national entrepreneurial policy (0.0287). The tertiary layer indicators have the highest weight on the assessment of college E&I education effect are learners' participation in activities after receiving E&I education (0.1619), followed by learners' entrepreneurial awareness (0.1108) and by lecturers' teaching methods (0.1068). The most the insignificant index was the assessment method of the course (0.0055).

According to the data in the AHP index, the following valuable conclusions are obtained.

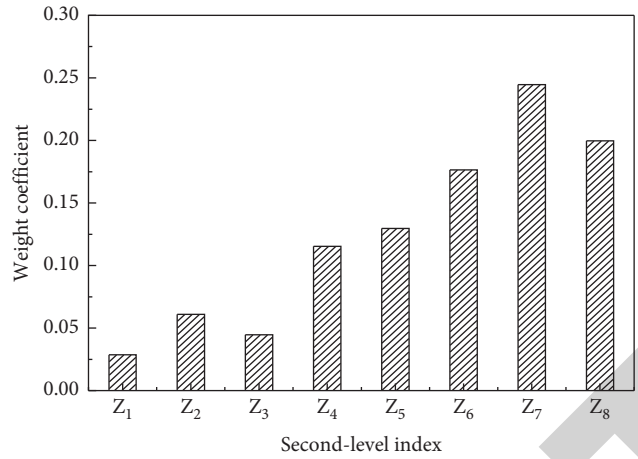

Figure 3: The weight coefficient of secondary layer index on the assessment of college E&I education effect.

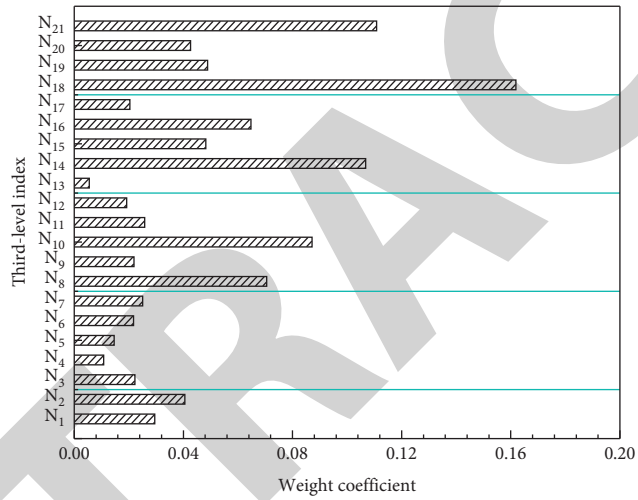

Figure 4: The weight coefficient of tertiary layer index on the assessment of college E&I education effect.

(1) Lecturers and learners are the focal points of E&I education activities, and learners' theoretical concepts and practical ability are the most important indicators to test the effect of E&I education.

(i) In the primary layer index, the weight coefficient of learner assessment (Y_4) is 0.4444, followed by the faculty (Y_3) with a weight coefficient of 0.3061, which also verifies that lecturers and learners are the two primary subjects of educational activities. Under the guidance of lecturers' active education, whether learners' theoretical concepts change and whether their practical ability is improved are crucial to testing learners' knowledge digestion and transformation. It can also be seen from the data that learners' awareness of E&I and their participation in entrepreneurial activities are the most important indicators for the assessment of E&I education effects, and they are also the elements that can most directly reflect educational achievements.

(2) Lecturers' teaching methods and their own practical experience are more important for the effect assessment of E&I education

(ii) The E&I course is different from other basic courses and professional courses. It is composed of theory, practice, feeling, learning, experience and other behaviors. In the entrepreneurship class, lecturers ought to follow the guidance concerning their entrepreneurship awareness and the experience in entrepreneurship planning, entrepreneurship preparation, and business management, etc. Thus, it is a must to change the traditional teaching methods, which directly affects the effect of education. Lecturers should follow the laws of education, teaching and personnel training, work hard in teaching, find methods, and then focus on the training of learners' abilities and the stimulation of entrepreneurial spirit in teaching methods and content.

(iii) Experiential entrepreneurship education is advocated. This is a brand-new teaching method for

entrepreneurship education course teaching, and it is also a necessary teaching method. Different from traditional entrepreneurship education, experiential entrepreneurship education attaches greater importance to the subject status of learners and the learning process, and emphasizes the reflection after experience. It is precisely to let each learner perform role-playing, learners generate new cognitions in new experiences, and collide with ideas and thoughts in sharing and communication, which is important for broadening learners' horizons, enhancing learners' ability to distinguish and demonstrate and express. The training of innovation consciousness is of great benefit.

(iv) At the same time, whether lecturers have their own entrepreneurial experience will also affect their teaching methods and content. According to the survey data, lecturers with entrepreneurial practice and company experience can provide entrepreneurial practice experience and explain entrepreneurial risks, and teach E&I courses. It helps to be more easily recognized by learners.

(3) E&I education environment is more important for effect assessment

(v) Colleges are the primary positions for the training of innovative talents. Their culture contains the spirit, style, and code of conduct of the college, which plays a subtle role in shaping the values of learners. The development of various E&I activities, such as E&I lectures, forums, and ERP simulation competitions, especially the construction of entrepreneurship competition platforms, has played a positive role in promoting learners' transformation of textbook knowledge into practical training, and has transformed the "battlefield" that learners experience. It extends outside the campus, and changes entrepreneurial link experience to the entrepreneurial project experience.

(vi) Through the competition platform, it can stimulate learners' innovative thinking, exercise, and improve learners' innovative ability. Furthermore, it displays learners' team projects with lack of resources through competitions to test entrepreneurial projects. Lastly, it prevents learners from blindly starting businesses and create a good environment of E&I, which will enhance the effect of E&I education. Therefore, we actively advocate various high-layer measures and organize schools to create a good atmosphere for E&I, ensure financial investment, explore potential entrepreneurial projects, and settle in incubation bases through competition platforms and community organizations, cultivate college learners' practical skills of E&I, and truly transform entrepreneurship education into practice.

(4) The construction of lecturers in E&I has an obvious effect on effect assessment

(vii) Lecturers are the key element affecting the effectiveness of education and teaching, and the layer of lecturer construction will affect the layer of scientific research, teaching effectiveness and learners' cognition. E&I education is ultimately implemented through teachers in colleges. So the teaching staff is an important factor in the assessment of education quality, which mainly includes: teacher background, that is, the basic conditions such as work experience, quality skills, professional knowledge, academic title and that college teachers should have for E&I education, including teachers' political quality, professional and intellectual qualities and ability quality are the key points of assessment; teachers' E&I ability, that is, teachers' innovation consciousness and scientific research, ability and related achievements; E&I teaching ability of teachers is the ability to master and implement the E&I education teaching methods and theory. E&I course is a complicated system engineering relying on professional education, interdisciplinary, rich in content, and strong in practice, which puts forward higher requirements for lecturers' comprehensive effect. This requires lecturers of E&I courses not only to have a relatively deep theoretical foundation of E&I and knowledge support in interdisciplinary fields, but also to have rich time experience in E&I, as well as teaching ability and teaching methods that effectively connect theory with entrepreneurship practice. Therefore, professional training should be provided to E&I lecturers in a timely manner, and carry out qualification certification based on the principles of teaching, practice, training, and assessment.

(viii) The construction of faculty for E&I requires not only a full-time teaching team, but also a diversified and multichannel part-time lecturer to supplement and alleviate the defect of the imbalanced knowledge structure. To take full advantage of the power of society and business, it is necessary to hire entrepreneurs, venture capitalists, and successful entrepreneurial alumni as adjunct faculty. And it is recommended to send outstanding lecturers to the enterprise to exercise flexibly, and lead learners to participate in entrepreneurial practice to put theories into practice.

3.4. Specific Countermeasures and Suggestions to Solve the Problem of Talents Training for College E&I Oriented to STS Industry. According to the survey results, status analysis and calculation results of quality evaluation model, it is found that the following problems exist in the talent training mode of college E&I oriented to STS industry: mainly reflected in the training goal and the social demand do not match, professional and unreasonable curriculum, the curriculum lags behind the social needs, teaching methods and evaluation form a single, etc., the main reason lies in the

grasp is not allowed in the current industry development laws, resulting in the concept of talent training, education, teaching methods and guarantee mechanism of talent training, etc, lagging behind the needs of the development of industry. Therefore, specific countermeasures and suggestions are put forward from the following five aspects.

3.4.1. Further Improve Relevant Policies and Systems. It is suggested that on the basis of further clarifying the guiding ideology and objectives, implementation principles, requirements and countermeasures of college E&I education, colleges and universities should give full play to the guiding role of school policies and formulate guiding opinions to encourage and promote the research and practice of college E&I education with reference to the spirit of relevant national documents, so as to form a unified understanding of innovation and entrepreneurship education on campus, At the same time, provide preferential treatment in terms of funds and rent, and give corresponding rewards to students who have made achievements.

3.4.2. Actively Promote the Development of Theoretical Research on College E&I Education for STS Industry. Colleges and universities should strengthen the research on innovation and entrepreneurship and related education, strengthen the connection between innovation research center, entrepreneurship service center and innovation and entrepreneurship classroom teaching, and make the teaching of theoretical knowledge effective in practice. Formulate a comprehensive, hierarchical and typed innovation and entrepreneurship teaching and practice plan, supervise the implementation, and implement the theoretical research into the practice of E&I education research.

3.4.3. Strengthen the Systematization and Scientization of the Teaching Process of E&I Education for STS Industry. In the teaching process, the service guarantee mechanism provided by colleges and universities should mainly focus on discipline education, curriculum, teaching mode and teaching management mode. The systematization and scientization of the teaching process of E&I is mainly reflected in strengthening the subject research, teaching research and teaching materials construction of E&I education, and truly implement the goal of learners' creativity development. In the teaching of the basic concepts, basic theories and basic methods of the subject, each learner's creative potential can be brought into full play in the teaching of E&I courses.

3.4.4. Provide Better Information and Intermediary Services and Create a Good Environment. To offer better information and intermediary services to create a good environment, colleges should further strengthen the construction of information systems related to E&I education, and use modern technical means to collect, research, process, and feedback short-term market information that meets the needs of learners. It provides learners with sufficient information for E&I through campus media to publish relevant information and projects. In addition, the school should rely on the existing business plan competition and other platforms to build a desired environment for E&I within the school, and strengthen the construction of innovation research centers and entrepreneurial intermediary service agencies to provide learners with the taxation, industry and commerce needed to start a business. They also provide consulting and financial guarantee services to stimulate learners' entrepreneurial enthusiasm.

3.4.5. Strengthen Investment in Manpower, Technology, and Capital. It is suggested that colleges and universities give full play to their advantages in technology, talents and resources to provide relevant information, materials, equipment and technology support for students' E&I activities. In particular, the scientific research achievements, invention patents and technology patents of school teachers should be given priority to students with E&I willingness and certain E&I ability, make it promote the transformation of scientific research achievements while E&I, and accelerate the process of transforming scientific research. Faced with the current shortage of lecturers in E&I education and various issues in the teaching process, colleges should better train lecturers, open the door to the whole society, and use their own advantages to attract some learners with solid theoretical knowledge and rich resources and high-effect talents with innovative practical application and entrepreneurial management experience. At the same time, in order to ensure the excellent supply of lecturers, the reform of the employment system of regular assessment and survival of the fittest should be adopted for lecturers engaged in E&I education. In addition, the collage needs to establish an E&I education fund, strive for relevant government support funds, special loans, and venture capital, and attract more social donations or donation funds to provide entrepreneurial funds for entrepreneurial teams to encourage and support college learners to start their own businesses.

4. Conclusions

(1) Based on the analysis of the importance and necessity of the assessment of college E&I education effect for the STS industry. This paper establishes an effect assessment index system for college E&I education for the STS industry from four aspects: top-layer design, college environment, faculty and learner assessment. The AHP assessment model is used to conduct a comprehensive assessment, which provides a scientific reference and reference for the research on the effect assessment system of college E&I education facing the STS industry in my country.

(2) AHP is used to determine the weight of influencing factors, which has strong objectivity and operability. The method combines the objective judgment of decision-maker and the objective judgment of decision analyst effectively, and realizes the systematization, mathematics and modeling of decision-maker's thinking

transformation process, which is easy to calculate and simple to understand. However, AHP is an objective method that relies too much on the judgment of experts. It is difficult to eliminate the interference and influence of human factors in the evaluation. It is more suitable for the comprehensive evaluation of the object system with little correlation between the assessment indicators.

(3) The AHP assessment results of the primary layer indicators show that the weight coefficient of learner assessment (Y_4) is 0.4444, followed by the faculty (Y_3) with a weight coefficient of 0.3061, which also verifies that lecturers and learners are the two primary subjects of educational activities. The lecturers and learners are the focus and primary body of E&I education activities in colleges facing the STS industry, and learners' theoretical concepts and practical abilities are the most important indicators to test the effect assessment of educational E&I education. Lecturers' teaching methods and their own practical experience is more important for the effect assessment of E&I education. The environment and atmosphere of E&I education is more important for effect assessment and the construction of lecturers for E&I has an obvious effect on education assessment.

(4) College E&I education and universities for STS industry must be solidly promoted from the following five aspects: Further improving relevant policies and systems; Actively promote the development of theoretical research on E&I education; Strengthen the systematization and scientization of the teaching process of E&I education; Provide better information and intermediary services and create a good environment; Strengthen investment in manpower, technology and capital. Only by cooperating in many aspects can we realize the good operation and improvement of the *i* E&I education system.

(5) The establishment of the assessment index system for the effect of college E&I education for STS industry is not achieved overnight, but will change with the goal of the STS industry. This needs to be continuously improved and improved in future research and practice, so as to make the assessment index system more targeted and the assessment results more effective, so as to provide support for the integration of STS industry into the development of various industries, so as to cultivate more excellent talents for social and economic development.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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