Analysis of Collaborative Development Path between Environmental Art Education and Cultural Creative Industry

Yue Zhang*

School of Media and Arts, Wuxi University, Wuxi, Jiangsu, China
yue19902022@163.com
*Corresponding author

Abstract: Under the background of cultural and creative industrialization, the development of environmental art design education is facing huge opportunities and challenges. Based on environmental art education and cultural and creative industries, this paper analyzed and studied the cultivation of innovative talents in environmental art. Based on the theory of entropy, the coordinated development of environmental art and cultural and creative industries has been discussed. Through a survey of 100 environmental art teachers in 10 universities in Z province, students' interest accounted for 99.00%. Teachers' level accounted for 97.00%, and innovation awareness accounted for 95.00%. These three factors are the top three influencing factors for the cultivation of innovative talents in environmental arts in universities in Z province. At the same time, through a survey of 100 employers, it was found that companies and enterprises' demand for environmental art innovative talents mainly focused on two aspects: professional skills (40.00%) and innovation awareness (31.00%). It can be seen that in the coordinated development process of environmental art education and cultural and creative industries, the cultivation of creative talents is the top priority.

1. Introduction

China's economy has developed rapidly, and technology, economy, culture and art have been fully integrated into the global economic integration. As a new economic force under the background of economic globalization, the cultural and creative industry has become the main pillar of economic development. Environmental art design is a comprehensive discipline. The environmental art design major in contemporary China has created an environmental art design with Chinese characteristics on the basis of learning from the teaching system of Western art colleges. The training of environmental art design professionals in colleges and universities should be demand-oriented to meet the needs of the market and to promote teaching reform.

Driven by society and economy, the development of environmental arts education has been promoted. Marks M systematically analyzed two cases. Among them, environmental art was used as

a mechanism, which engaged the community in building environmental understanding [1]. Li Y was based on the teaching reform of computer-aided environmental art design major. Through the study of professional professional courses, students master the knowledge of art theory, art design and architectural design methods, urban planning and other related fields [2]. Taguchi J surveyed the early context of built environment education in the United States and the American built environment education curriculum. At the time, many art educators took lessons from environmental issues and pioneered new fields in art, architectural design and education [3]. These studies are very thorough for the professional investigation of environmental art and design. However, research on education still needs to be in-depth.

The cultural and creative industry economy is one of the latest trends in the development of the global cultural economy. Innovation and creativity are drivers of global economic and cultural practice. Sang D P collected and analyzed policy discourses on Chinese cultural and creative industries (CCI) keywords from 2006 to 2020. He also conducted text mining and web analysis and found that China's CCI policy discourse was increasingly attractive [4]. The purpose of Shafi A A was to assess the extent to which South Africa's CCI contributed to economic development through its foreign exchange earnings and employment profiles [5]. Through the proof-of-concept of the development law of CCI, Hung T A discussed the core issues that must be paid attention to when promoting the agricultural cultural and creative industries to realize the lack of economic benefits [6]. These studies have carried out different explorations on the contribution of cultural and creative industries to the economy. How to coordinate the development of environmental art education with the cultural and creative industries is a major research content at present.

The innovation of this paper is to take environmental art education and cultural and creative industry as the research object, and take the coordinated development of industry and academia as the carrier. From the perspective of entropy, the coordinated development of environmental art and cultural and creative industries is expounded.

2. Coordinated Development Method of Environmental Art and Cultural and Creative Industries Based on Entropy Theory

2.1 Development of Environmental Arts Education and Cultural Creativity

The social and imaginative industry depends on the profound, social and diversion needs of individuals in the time of utilization. It is a new business form based on high-tech technology, with the Internet as the carrier. The cultural and creative industry is the only way for China to adjust its economic structure, enhance its creativity, and strengthen the development of the manufacturing industry [7].

Ecological craftsmanship and social and inventive ventures are firmly connected, that is, the collaboration and improvement between natural workmanship training and social and innovative enterprises. Ecological craftsmanship training is the source and underpinning of the advancement of social business, which gives a modern spine to the improvement of social and inventive ventures. Then, the quick advancement of the social and innovative industry has advanced the improvement of ecological craftsmanship and plan training [8-9]. The film and television industry has gradually recovered and developed reasonably, more new formats have been formed, and the industrial demand tends to be innovative and high-quality. Online video, live broadcast, VR + film and television and other new media forms have a lot of room for development [10-11].

The main problems of environmental art education in the context of the cultural and creative industry are shown in Figure 1.
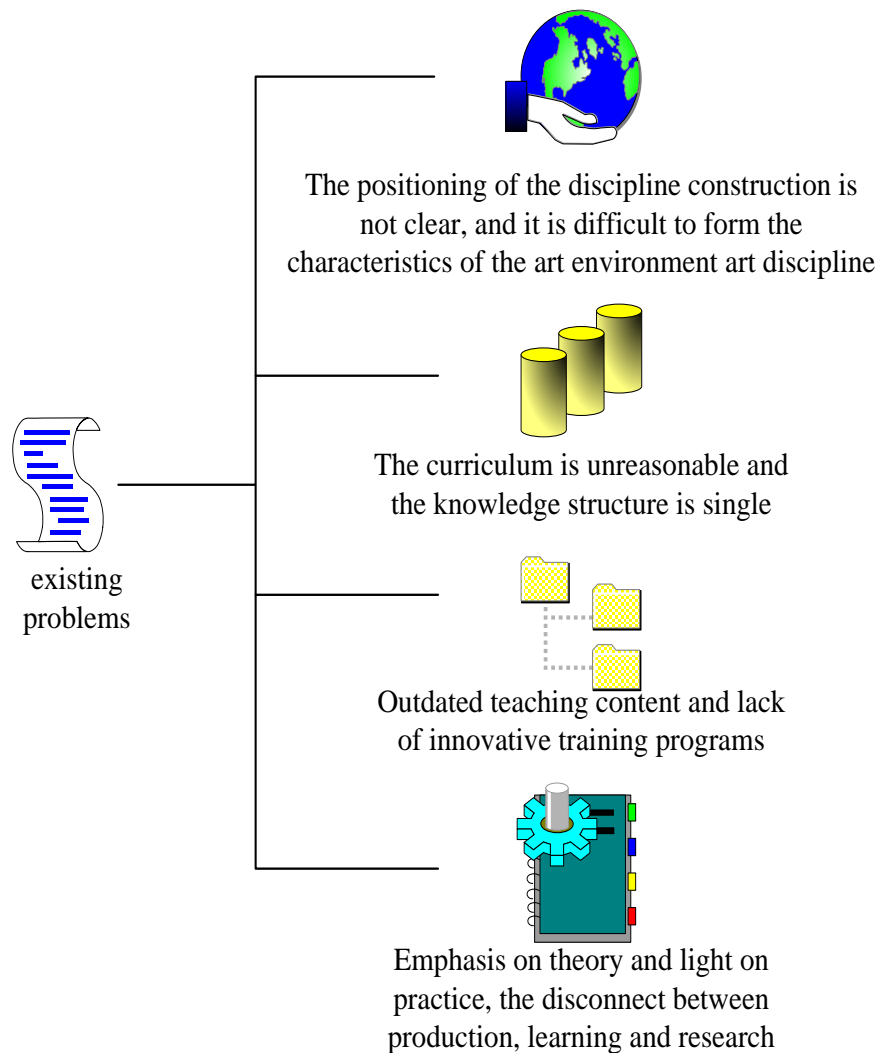
Figure 1: Problems in environmental art education

The curriculum of environmental art education in China is relatively rigid, and the teaching methods are not flexible enough. It is necessary to focus on the cultivation of individual skills, rather than courses that focus on innovative thinking. Students majoring in environmental art are not open-minded enough, and their creativity level is obviously backward, which has become a bottleneck for the development of environmental art in China. At present, most art colleges and universities in China regard the combination of "production, learning and research" as an important policy. However, on the whole, the education of "social practice" and "school" has not yet reached a balance [12].

"Creativity" is the basic requirement of environmental art design. "Industry" is the inevitable trend of its development. In order to meet the development needs of China's cultural and creative industries, the training methods of talents have been adjusted and optimized, so that they can be better cultivated scientifically and comprehensively, which has become an important direction of environmental art design education [13-14]. This paper puts forward some suggestions on how to establish a creative talent training model that is compatible with the coordinated development of the cultural and creative industry from the following aspects in Figure 2.
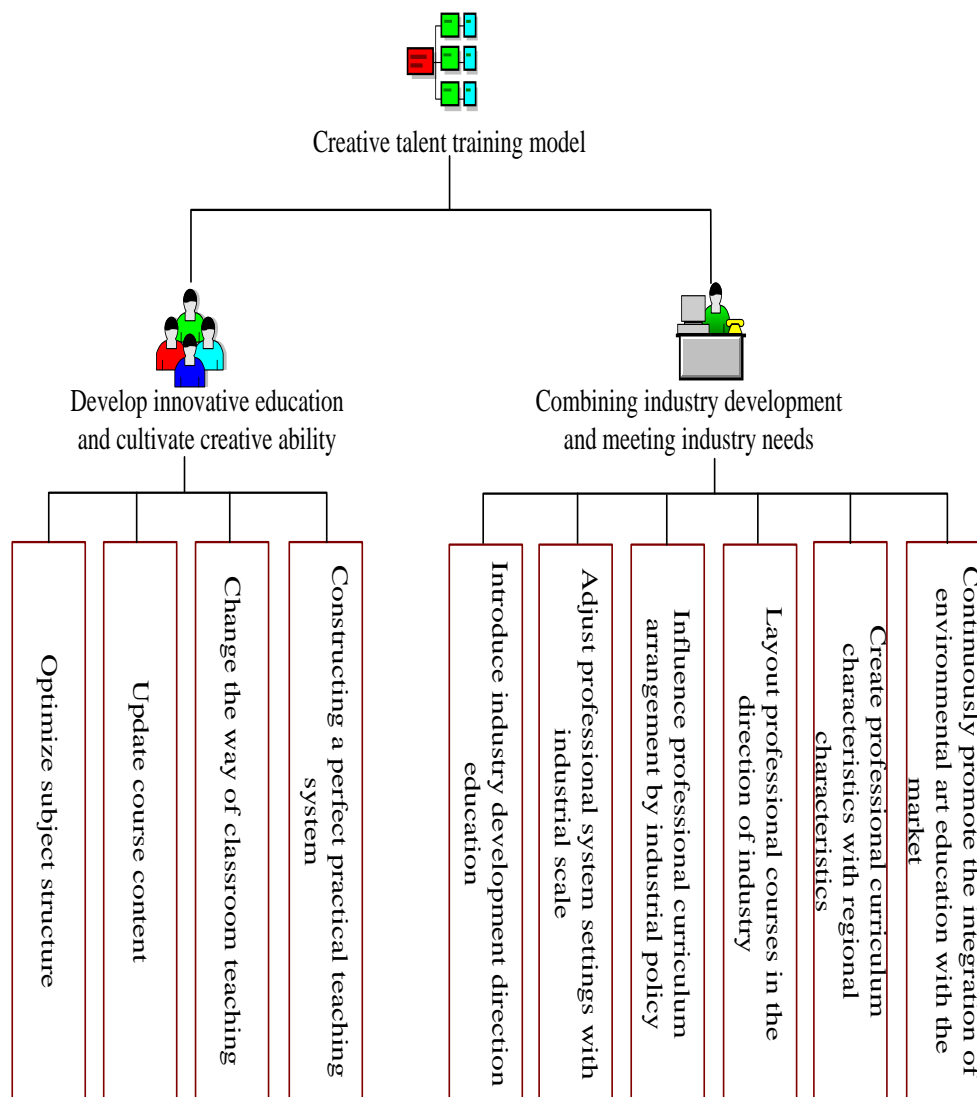
Figure 2: Creative talent training model

The development of the cultural and creative industry determines the market trend. Environmental art education should strengthen market research under the conditions of a market economy. A practice base that is in line with the market has been established. It is also necessary to actively integrate into the active cultural and creative market, which draws the nutrition of environmental art from the market. According to the needs of the market, training methods and content are adjusted. Market and innovation-oriented innovative teaching methods give full play to the advantages of various teaching environments and resources such as campuses and markets. The combination of theory and practice, teaching and practice has cultivated cultural and creative talents who meet the requirements of the times. The reform and development of environmental art education has provided infinite vitality for the development of China's cultural and creative undertakings [15-16].

2.2 Coordination Mechanism of Environmental Art Technology Education and Innovation Education

(1) Mechanism of action

Environmental arts technical education and environmental arts innovation education are

interacted. As they communicate with the external environment, their respective core values also change. The change of their own succession value not only affects the change of the total succession value of the entire innovation system, but also produces succession change kD_C due to the interaction between the two.

The interaction between environmental art technology education and environmental art innovation education is as follows:

1) If the direct value of environmental art technical education and environmental art innovation education does not increase or decrease ($kD_Y = 0$ and $kD_O = 0$), the order of each system do not change. In terms of technology or innovation, the two systems themselves have changed almost zero. The interaction between the two is minimal, $kD_C = 0$.

2) The direct line of environmental art technology education becomes negative ($kD_Y < 0$). However, the value of the direct coefficient of innovation education increases ($kD_O > 0$). Technical education moves toward order, while innovation education becomes more chaotic. At this time, environmental arts education can be followed by technical education. However, current innovations have not changed accordingly, which hinders technical education. The direct descendant of the two interactions becomes positive ($kD_C > 0$).

3) If the direct line of environmental art innovation education is negative ($kD_O < 0$), and the direct line value of technical education increases ($kD_Y > 0$), then innovation education develops in an orderly manner and technical education is more chaotic. At this time, it may be that environmental art education has carried out innovation education, rather than technical education. The two do not match, and the interaction relationship is positive ($kD_C > 0$).

4) If the children of environmental art technology education and innovation education are both negative ($kD_Y < 0$ and $kD_O < 0$), then the order of technology education and innovation education has improved. At this time, technical education became the driving force of innovative education. Innovative education is the guarantee of technical education. The interaction between the two would cause a direct change $kD_C < 0$.

It can be seen from the above analysis that in the operation of environmental art technology education and innovation education, the two influence each other. The direct variation kD_C produced by the interaction between them is:

$$kD_C = \begin{cases} > 0, kD_Y > 0 \, or \, kD_O > 0 \\ = 0, kD_Y = 0 \, and \, kD_O = 0 \\ < 0, kD_Y < 0 \, and \, kD_O < 0 \end{cases}$$

(1)

In the operation of environmental art innovation education, if the order of technology and innovation education can be improved at the same time, it shows the interactive relationship between the two. Coordination refers to the cooperation and coordination among the various subsystems in the system.

(2) Synergy model

In the operation of environmental technology education and innovation education, the interaction between the two can be measured. On this basis, combined with the existing models, a synergy model is established.

It is assumed that the order parameter in the development process of an environmental art technology education is $e_Y = (e_{Y1}, e_{Y2}, ..., e_{Ym})$. Among them, $m \geq 2, \alpha_{Yo} \leq e_{Yo} \leq \beta_{Yo}, 0 \in [1, m]$ and $e_{Y1}, e_{Y2}, ..., e_{Ym}$ are various influencing factors that affect the development of environmental art technology education. Assuming that the larger the value of $e_{Y1}, e_{Y2}, ..., e_{Yl}$, the higher the order degree of environmental art technology education. The larger the value of $e_{Yl+1}, e_{Yl+2}, ..., e_{Ym}$, the lower the order degree of environmental art technology education. Then the systematic order degree of the order parameter component e_{Yo} of environmental art and technology education is:

$$i_Y(e_{Yo}) = \begin{cases} \dfrac{e_{Yo} - \alpha_{Yo}}{\beta_{Yo} - \alpha_{Yo}}, & o \in [1, l] \\ \dfrac{\beta_{Yo} - e_{Yo}}{\beta_{Yo} - \alpha_{Yo}}, & o \in [l+1, m] \end{cases}$$

(2)

In the same way, the order parameter e_O and order degree that affect the development of environmental art innovation education can be defined:

$$i_Y(e_{Oo}) = \begin{cases} \dfrac{e_{Oo} - \alpha_{Oo}}{\beta_{Oo} - \alpha_{Oo}}, & o \in [1, l] \\ \dfrac{\beta_{Oo} - e_{Oo}}{\beta_{Oo} - \alpha_{Oo}}, & o \in [l+1, m] \end{cases}$$

(3)

$$i_Q(e_Q) = \sum_{o=1}^{m} \gamma_o i_Q(e_{Qo}), \gamma_o \geq 0, \sum_{o=1}^{m} \gamma_o = 1$$

(4)

Similarly, it can be seen from formula that $i_o(e_O) \in [0,1]$. When $i_o(e_O)$ is smaller, its regular contribution to environmental art innovation education is less, and its order is lower. On the contrary, when the value of $i_o(e_O)$ is larger, the order of innovation education is also higher.

2.3 Influence of Cultural and Creative Industries on the Development of Environmental Art Education

The cultural and creative industry is a complex, dynamic and non-linear system, including technological innovation and cultural innovation. Other subsystems of Wenchuang are regarded as a whole. The sum of the sub-variables caused by the interaction of each subsystem is defined as kD^*, and $kD^* = 0$ is assumed. The direct changes in the cultural and creative industry are:

$$kD = kD_Y + kD_O + kD_C + kD^*$$

(5)

Among them, Q is a positive number and y is time. α, β and λ are variable coefficients, which correspond to technology industry, cultural industry and collaborative innovation. The positive and negative values of α, β and λ are determined by the innovation degree of environmental art education. The development of environmental arts education over time can be obtained from the formula:

$$H = Se^{-(\alpha+\beta+\lambda)Qy}$$

(6)

3. Experiments on the Cultivation of Innovative Environmental Art Talents in Z Province

This research randomly selects a total of 100 environmental art teachers from 10 colleges and universities in Z province to conduct a questionnaire survey. A total of 100 questionnaires are distributed and 100 are returned as valid questionnaires. Table 1 is an analysis of teachers' gender and age.

Table 1: Faculty gender and age

		number of people	proportion
gender	male	55	55.00%
	Female	45	45.00%
generation	under 35	64	64.00%
	35-45 years old	19	19.00%
	45+	17	17.00%

Age structure: It refers to the proportion of teachers in each age group in a specific field, which is called the teacher age structure. The age composition of teachers is the inner potential of teacher resource development and an important reflection of teacher resource development ability. From the data in Table 1, it can be seen that young teachers under the age of 35 account for 64.00%. Obviously, their age is generally lower and the structure is not ideal, which is related to the later establishment of the environmental art design profession. In recent years, with the development of education in China and the pressure of employment, the shortage of teachers has undergone tremendous changes.

As can be seen from Figure 3, the majority of respondents found that the main factor affecting the development of creative talents is student interest (99.00%). If students do not have a strong interest in the learning and training of professional learning, skills and knowledge, it is difficult to stimulate their enthusiasm for innovation and initiative, and it is even more difficult to implement the school's advantages. According to the survey, the top three factors affecting artistic innovation talents in Z province are students' interest (99.00%), teacher level (97.00%), and innovation consciousness (95.00%). It can be seen that students' interest, teachers' level, and innovation consciousness are important factors that determine innovation ability, which must be started from three aspects.

At the same time, this paper also distributes 100 questionnaires to employers (enterprises, companies and scientific research units), and 100 questionnaires are returned as valid questionnaires. Through the investigation of artistic innovation talents in universities in Z province, it is found that the current quality structure of university students in Z province is multi-faceted, multi-level and multi-dimensional. In the questionnaire survey of the company, the investigation team divided the quality of environmental art innovation talents into professional skills, innovation consciousness, multidisciplinary knowledge, work experience, team spirit, practical ability, coordination ability, etc. The study finds that professional skills accounts for 40.00% and innovation awareness accounts for 31.00%. Multidisciplinary knowledge accounts for 14.00% and work experience accounts for 6.00%. Team spirit accounts for 4.00% and practical ability accounts for 3.00%. Coordination ability accounts for 2.00%, as shown in Figure 4.
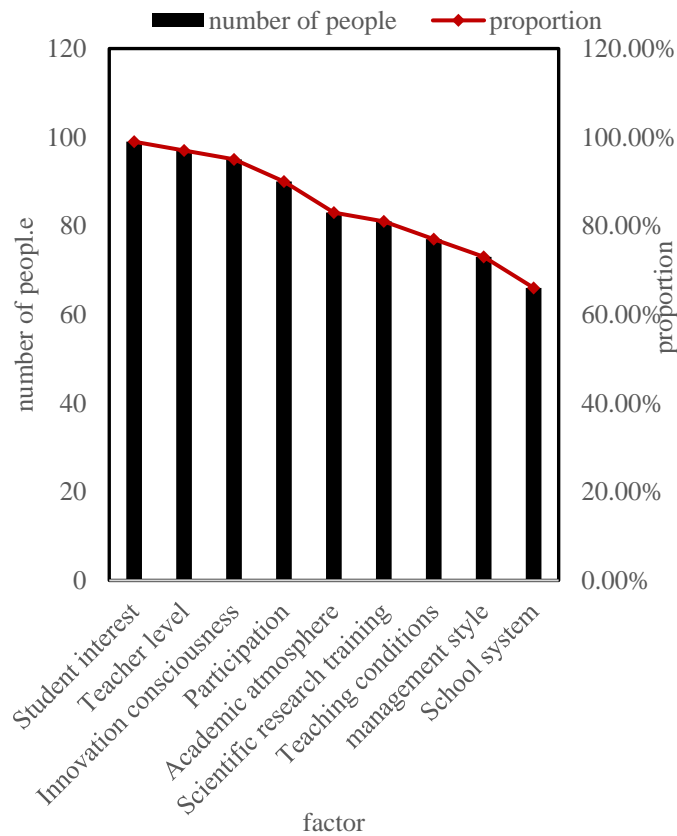
Figure 3: Factors restricting the cultivation of artistic innovative talents in universities in Z province
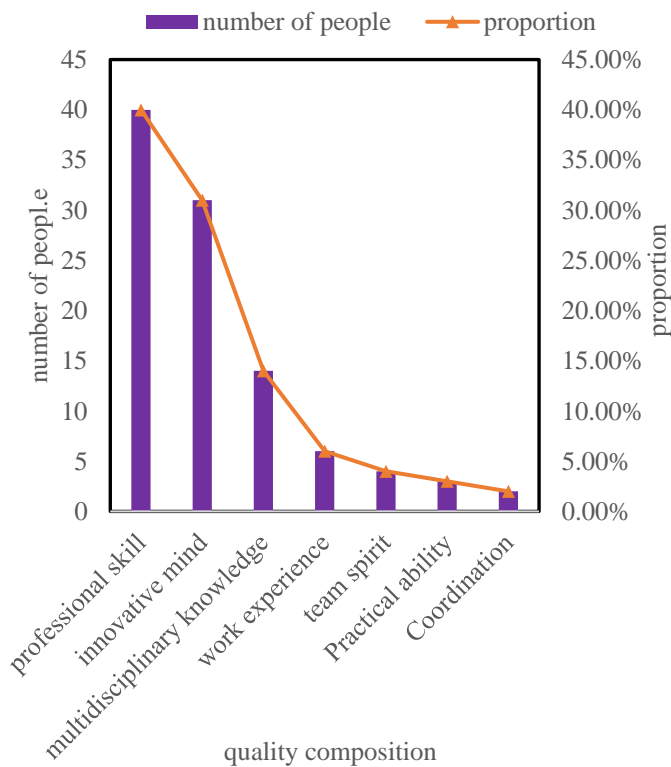

Figure 4: Quality composition of innovative talents in environmental arts in universities in Z province

Specifically, for the countermeasures and suggestions for the cultivation of innovative talents in environmental art, some specific suggestions in Figure 5 are given.
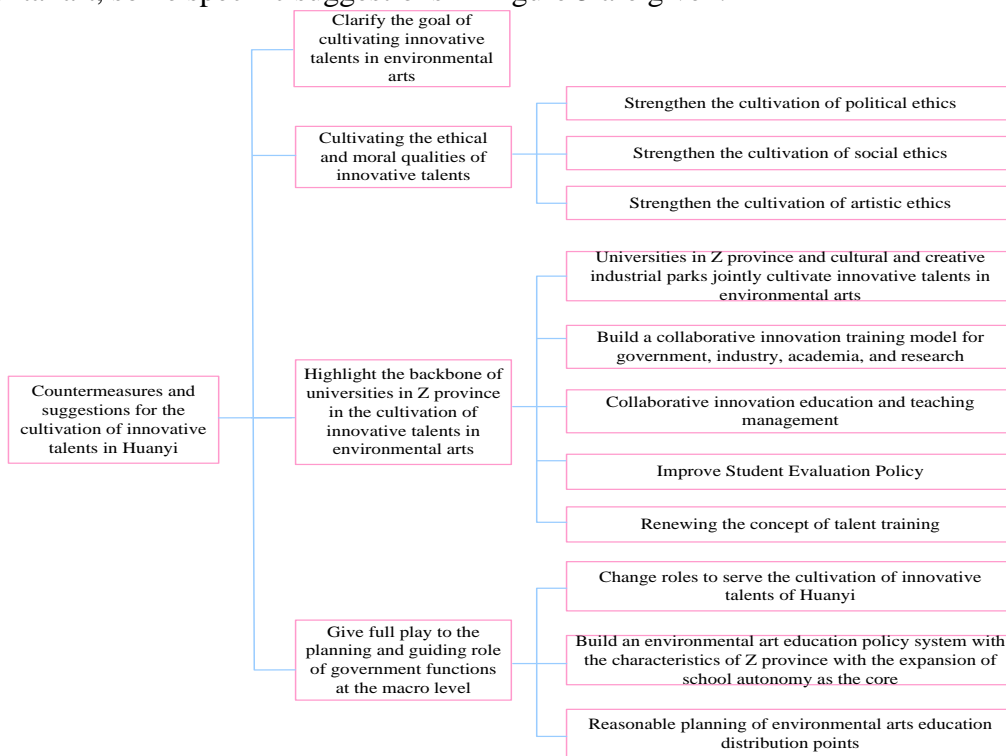

Figure 5: Countermeasures and suggestions for the cultivation of innovative talents in environmental art

The cultivation of students' quality is the way to test and exercise the creativity of talents. The partnership between the government and business is the closest. Enterprises are the stage for environmental art students. It is the best creative test site and an important carrier for the development of the cultural and creative industry. Environmental art talents rely on the company's production and operation. Through art projects that are closely integrated with the market, they are involved in the creation, interpretation and management of works. This can not only grasp the latest trend of the industry, but also grasp the trend of the market, so as to strengthen the cultivation of innovation awareness and ability.

4. Conclusions

Under the background of cultural and creative industrialization, it should be focused on the organic combination of creative ability and cultural literacy to promote the sustainable development of environmental art education. The development of the cultural and creative industry requires more and more professionals, so as to effectively improve the quality of cultural and creative products. Under the background of environmental art, the combination of education and cultural and creative industries, scientific research and market is the general trend. Environmental art education must combine the needs of the current society with its own characteristics. The development of the teaching mode of industry-university-research cooperation is the development direction of education in the future. The innovative teaching mode of industry-university-research cooperation has been carried out to improve teaching methods and enrich teaching experience, which made the education work more systematic and mature. The purpose was to cultivate and improve students' comprehensive, research and creative ability, which was to cultivate senior professional design

talents for social economy and cultural construction.

Acknowledgement

References

[1] Marks M, Chandler L, Baldwin C. Environmental art as an innovative medium for environmental education in Biosphere Reserves. Environmental Education Research, 2017, 23(9-10):1307-1321.

[2] Li Y. Teaching innovation of environmental art design specialty based on computer aided. Technical Bulletin, 2017, 55(20):548-555.

[3] Taguchi J. A Case Study Of Built Environment Education Theory In The U.S.: The "Architecture and Children" curriculum and its background. Journal of Environmental Engineering (Transactions of AIJ), 2018, 83(749):625-635.

[4] Sang D P. Policy Discourse Among the Chinese Public on Initiatives for Cultural and Creative Industries: Text Mining Analysis: SAGE Open, 2022, 12(1):45-65.

[5] Shafi A A, Sirayi M, Abisuga-Oyekunle O A. Issues, challenges and contributions of cultural and creative industries (CCIs) in South African economy. Creative Industries Journal, 2020, 13(5):1-17.

[6] Hung T A, Hsu C K, Chen Y C. Constructing a Creative Agricultural Complex Base on the Law for Development of the Cultural and Creative Industries in Taiwan. Open Access Library Journal, 2019, 06(3):1-11.

[7] Liu, Sam C H. Examining social capital, organizational learning and knowledge transfer in cultural and creative industries of practice. Tourism Management, 2018, 64(feb.):258-270.

[8] Jin, Yuanpu. New Forms, Trends and Problems of Cultural and Creative Industries in China Today. Contemporary Social Sciences, 2017, v.2(05):145-161.

[9] Gu X, O'Connor J. Teaching 'tacit knowledge' in cultural and creative industries to international students. Arts and Humanities in Higher Education, 2019, 18(2-3):140-158.

[10] Samuel K C. Neoliberalism, Digital Communication Technologies and the Cultural and Creative Industries. Advanced Journal of Social Science, 2019, 6(1):96-108.

[11] J O'Connor, Gu X, Vickery J. Teaching the cultural and creative industries: An international perspective. Arts and Humanities in Higher Education, 2019, 18(2-3):93-98.

[12] Wang S T, Li M H. Global Search PSO to Analyze the Values of Cultural and Creative Industries. The Open Cybernetics & Systemics Journal, 2017, 11(1):67-84.

[13] Eikhof D R. Analysing decisions on diversity and opportunity in the cultural and creative industries: A new framework. Organization, 2017, 24(3):289-307.

[14] Nevskaya A. Exports of Goods and Services from Cultural and Creative Industries. International Affairs, 2017, 63(3):163-172.

[15] Zhang R, Zhang X. Study on the factors affecting the development of cultural and creative e-commerce industries in henan province. Revista de la Facultad de Ingenieria, 2017, 32(14):283-289.

[16] Yi, Na, Wu, Lingwei. Development and Protection: Reshaping Cultural Policies—A Study of the UN's Advancement of Cultural and Creative Industry in Developing Countries. Contemporary Social Sciences, 2017, v.2(05): 111-123.