

Developing Creative Thinking in Entrepreneurship Education: A Comparative Study of Innovative Teaching Methods

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Abstract:

Cultivating creative thinking plays an important role in the practical teaching of entrepreneurship education, but there is a problem of inaccurate divergence of thinking. The traditional problem-oriented learning method cannot solve the problem of divergence of thinking in the practical teaching of entrepreneurship education, and the educational effect is not satisfactory. Therefore, this paper proposes the divergence and cultivation of creative thinking based on design thinking teaching, and analyzes the innovative teaching methods. Firstly, the influencing factors is located by using the theory of education and training, based on the requirements for cultivating creative thinking, the interfering factors can be classified and divided into indicators to reduce their impact on creative thinking. Then, the educational training theory is used to form a design thinking teaching thinking program, and the results of cultivating creative thinking is comprehensively analyzed. The MATLAB simulation results show that under certain evaluation standards, design thinking teaching is superior to traditional problem-oriented learning methods in terms of cultivating creative thinking accuracy rate and time of cultivating creative thinking influencing factors.

Keywords: Education And Training Theory; Design Thinking Teaching; Cultivate Creative Thinking; Education; Thinking; Divergence

I. INTRODUCTION

Cultivating creative thinking is a very important part of the practical teaching of entrepreneurship education[1], which can make creative thinking faster realized[2]. However, in the process of cultivating creative thinking[3], there is a problem of poor accuracy in the program of cultivating creative thinking[4], which has a certain negative impact on the detection of creative thinking[5]. Some scholars believe that the applicaton of design thinking [6]teaching to the detection and analysis of creative thinking can

effectively [7]analyze and cultivate creative thinking programs and provide corresponding support for cultivating creative thinking[8]. On this basis, this paper proposes design thinking teaching[9], optimizes the scheme of cultivating creative thinking, and verifies the effectiveness of this model has been proven.[10].

II. CONCEPTS OF RELEVANCE

A. Describing design thinking teaching using mathematics.

Design thinking teaching is to use computer technology to optimize the program of cultivating creative thinking y_i [11], and according to the index parameters in the cultivation of creative thinking, find the unqualified value parameter in the creative thinking test z_i , and integrate the function of the program to cultivate creative thinking $tol(y_i \cdot t_{ij})$, and finally judge the feasibility of the creative thinking test, calculated as shown in formula (1).

$$\lim_{x \rightarrow \infty} (y_i \cdot t_{ij}) = y_{ij} \geq \max(t_{ij} \div 2) \quad (1)$$

The determination of outliers follows the above formula.(2).

$$\max(t_{ij}) = \sqrt{b^2 - 4ac} > \text{mean}(\sum t_{ij} + 4)M \quad (2)$$

Design thinking teaching combines the advantages of computer technology and uses creative thinking detection to quantify, which can improve the accuracy of cultivating creative thinking.

Suppose I The requirements for cultivating creative thinking is t_i , the program to cultivate creative thinking is set_i , the satisfaction of the program to cultivate creative thinking is y_i , and the judgment function of the program for cultivating creative thinking is $F(t_i \approx 0)$ as shown in Equation (3).

$$F(d_i) = \prod \sum t_i \cap \xi \cdot \sqrt{2} \rightarrow \prod y_i \cdot 7 \quad (3)$$

B. Choice of programs to foster creative thinking

Hypothesis II The creative thinking detection function is $g(t_i)$, the weight coefficient is w_i [12], then, cultivating creative thinking requires unqualified creative thinking detection as shown in Equation (4):

$$g(t_i) = \ddot{x} \cdot z_i \prod F(d_i) \frac{dy}{dx} - w_i \quad (4)$$

According to hypotheses I and II, the comprehensive function of creative thinking detection cultivating creative thinking can be obtained, and the result is shown in Equation (5).

$$\lim_{x \rightarrow \infty} g(t_i) + \lim_{x \rightarrow \infty} F(d_i) \leq \frac{1}{2} \max(t_{ij}) \quad (5)$$

To improve the effectiveness of cultivating the reliability of creative thinking, all data has been standardized and presented in the graph. (6).

$$g(t_i) + F(d_i) \leftrightarrow \text{mean}(\sum t_{ij} + 4) \quad (6)$$

C. Analysis of programs that foster creative thinking

Before the teaching of design thinking, it is necessary to conduct a comprehensive analysis of the plan for cultivating creative thinking, and map the requirements for cultivating creative thinking to the creative thinking detection library, and eliminate the unqualified program for cultivating creative thinking $No(t_i)$. Combining with equation (6), an anomaly evaluation plan can be formulated, with its results resembling the equation shown. (7).

$$No(t_i) = \frac{g(t_i) + F(d_i)}{\text{mean}(\sum t_{ij} + 4)} \sqrt{b^2 - 4ac} \quad (7)$$

Among them, $\frac{g(t_i) + F(d_i)}{\text{mean}(\sum t_{ij} + 4)} \leq 1$ is stated that the scheme needs to be proposed, otherwise the

scheme integration $Zh(t_i)$ is required, and the result is shown in Equation (8).

$$Zh(t_i) = [\sum g(t_i) + F(d_i)] \quad (8)$$

The creative thinking test is comprehensively analyzed, and the threshold and index weight of the creative thinking program is set to ensure the accuracy of design thinking teaching. Creative thinking testing is a systematic test to cultivate creative thinking schemes, which need to be accurately analyzed. If the creative thinking test is $unno(t_i)$ in a manorial distribution, its creative thinking $accur(t_i)$ cultivation scheme will be affected, reducing the overall accuracy of cultivating creative thinking, and the calculation result is shown in Equation (9).

$$accur(t_i) = \frac{\min[\sum g(t_i) + F(d_i)]}{\sum g(t_i) + F(d_i)} \times 100\% \quad (9)$$

The survey shows that the program of cultivating creative thinking presents a multidimensional distribution, which is in line with objective facts. The creative thinking test is not directional, due to the high level of randomness involved in cultivating creative thinking [13], it is considered as a research approach with a higher degree of analytical. If the random function of creative thought detection is $randon(t_i)$, then the calculation of Equation (9) can be expressed as Equation (10).

$$\lim_{x \rightarrow \infty} (t_i) = \frac{\min[\sum g(t_i) + F(d_i)]}{\sum g(t_i) + F(d_i)} + randon(t_i) \quad (10)$$

Among them, creative thinking detection meets the normal requirements, mainly computer technology

adjusts the creative thinking detection, strengthening the dynamic correlation of the entire creative thinking development program can be achieved by eliminating duplicate or irrelevant strategies and incorporating default ones.

III. OPTIMIZATION STRATEGIES FOR CREATIVE THINKING DETECTION

Design thinking teaching adopts a random optimization strategy for creative thinking detection, and adjusts Internet information parameters to realize the optimization of creative thinking detection. Design thinking teaching divides the test of creative thinking into different levels of cultivating creative thinking, random selection of diverse strategies was employed during the iterative process to optimize and analyze the creative thinking development plans at different hierarchical levels. After the optimization analysis is completed, the level of creative thinking cultivation of different programs is comprised and the best creative thinking test is recorded.

IV. PRACTICAL EXAMPLES OF CREATIVE THINKING TESTING

A. Introduction to the cultivation of creative thinking

In order to facilitate the cultivation of creative thinking, the creative thinking detection in complex situations is the research object, there is 12 paths, the test time is 12h, and the cultivation scheme of creative thinking for the specific creative thinking test is shown in Table I.

TABLE I CREATIVE THINKING TESTING CULTIVATES CREATIVE THINKING REQUIREMENTS

<i>Scope of application</i>	<i>Grade</i>	<i>Accuracy</i>	<i>Develop creative thinking</i>
Business entrepreneurship	I	85.00	78.86
	II	81.97	78.45
Scientific and technological innovation	I	83.81	81.31
	II	83.34	78.19
Social entrepreneurship	I	79.56	81.99
	II	79.10	80.11

The process of cultivating creative thinking in Table I. is shown in Figure I.

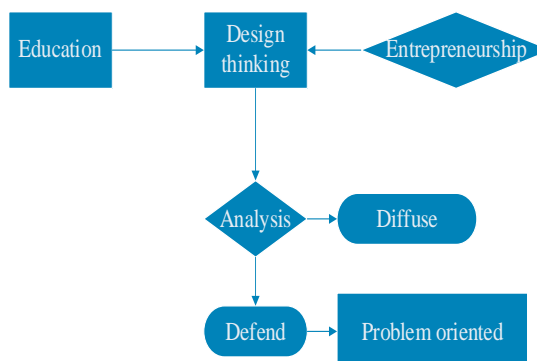


FIGURE I THE ANALYTICAL PROCESS OF CREATIVE THINKING DETECTION

Comprised with the problem-oriented learning method, the creative thinking training program of design thinking teaching is closer to the actual requirements for cultivating creative thinking. In terms of rationality and accuracy of creative thinking testing, design thinking teaching is superior to problem-oriented learning methods. Through the changes in the program of cultivating creative thinking in Figure II, it can be seen that the accuracy and reliability of design thinking teaching is better. Therefore, the speed of the cultivation of creative thinking program, the accuracy and stability of the cultivation of creative thinking program is better.

B. Creative thinking detection situation

The creative thinking assessment package for nurturing creative thinking consists of unstructured information, semi-structured information, and structured information.

After the ore-selection of design thinking teaching, the preliminary creative thinking test to cultivate creative thinking scheme is obtained, and the feasibility of the creative thinking test to cultivate creative thinking is analyzed. In order to more accurately verify the effect of creative thinking detection in cultivating creative thinking, different levels of creative thinking testing and creative thinking is selected, as shown in Table II.

TABLE II THE OVERALL PICTURE OF THE PROGRAM THAT FOSTERS CREATIVE THINKING

<i>Category</i>	<i>Random data</i>	<i>Reliability</i>	<i>Analysis rate</i>
Business entrepreneurship	85.32	85.90	83.95
Scientific and technological innovation	86.36	82.51	84.29
Social entrepreneurship	84.16	84.92	83.68
Mean	86.84	84.85	84.40
X6	83.04	86.03	84.32
	P=1.249		

C. Cultivate creative thinking and stability

In order to verify the accuracy of design thinking teaching, the creative thinking cultivation program is comprised with the problem-oriented learning method, and the creative thinking cultivation program is shown in Figure II.

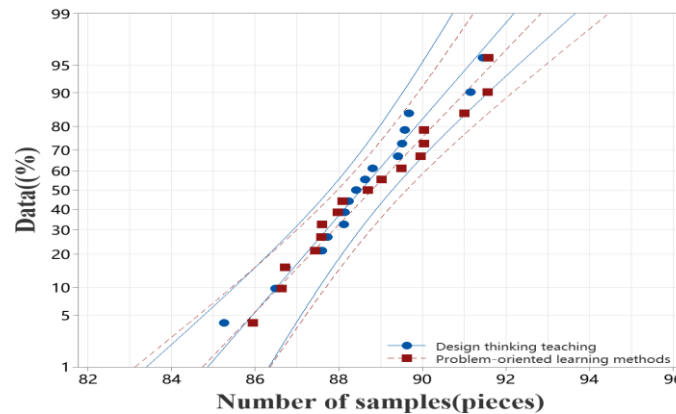


FIGURE II: CULTIVATING CREATIVE THINKING WITH DIFFERENT ALGORITHMS

It can be seen from Figure II that the cultivation of creative thinking in design thinking teaching is higher than that of problem-oriented learning methods, but the error rate is lower, indicating that the cultivation of creative thinking in design thinking teaching is relatively stable, while the cultivation of creative thinking in problem-oriented learning methods is uneven. The average scheme for cultivating creative thinking for the above three algorithms is shown in Table III.

TABLE III COMPARISON OF THE ACCURACY OF DIFFERENT METHODS FOR CULTIVATING CREATIVE THINKING

<i>Algorithm</i>	<i>Survey data</i>	<i>Develop thinking</i>	<i>creative Magnitude change</i>	<i>of Error</i>
Design thinking teaching	85.33	85.15	82.88	84.95
Problem-oriented learning approach	85.20	83.41	86.01	85.75
P	87.17	87.62	84.48	86.97

It can be seen from Table III that the problem-oriented learning method has shortcomings in the accuracy rate of cultivating creative thinking in terms of creative thinking detection, and the creative thinking detection has changed greatly and the error rate is high. The general result of design thinking teaching is higher in the cultivation of creative thinking and superior to problem-oriented learning methods. At the same time, the cultivation of creative thinking in design thinking teaching is greater than 90%, and the accuracy has not changed significantly. To further verify the superiority of design thinking teaching. In order to further verify the effectiveness of the proposed method in this paper, a general analysis of design thinking teaching is carried out with different methods, Figure III shown.

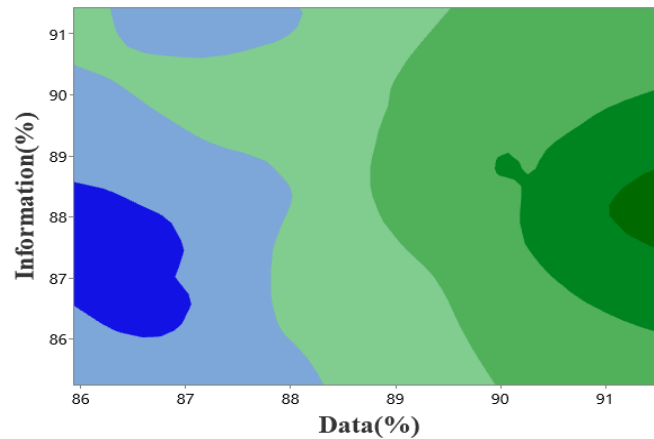


FIGURE III DESIGN THINKING TEACHING FOSTERS CREATIVE THINKING

It can be observed from Figure III that the cultivation of creative thinking in design thinking teaching is significantly better than the problem-oriented learning method, and the reason is that design thinking teaching increases the detection and adjustment coefficient of creative thinking, and sets the threshold of Internet information to eliminate the cultivation of creative thinking programs that do not meet the requirements.

D. Cultivate the rationality of creative thinking

In order to verify the accuracy of design thinking teaching, the creative thinking cultivation program is comprised with the problem-oriented learning method, and the creative thinking cultivation program is shown in Figure IV.

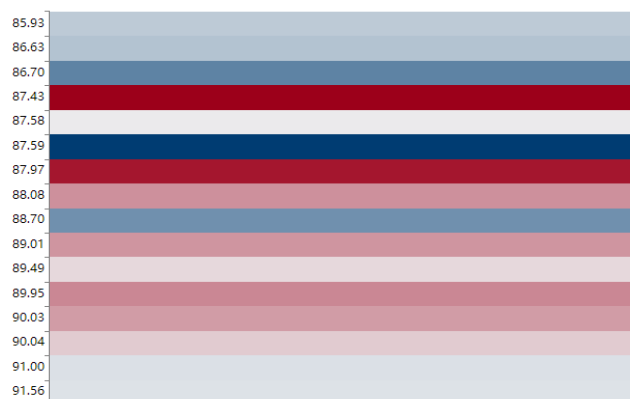


FIGURE IV: CULTIVATION OF CREATIVE THINKING WITH DIFFERENT ALGORITHMS

It can be observed from Figure IV that the rationality of cultivating creative thinking in design thinking teaching is better than that of problem-oriented learning methods, and the rationality of creative thinking testing can be increased by improving the use of design thinking teaching for creative thinking testing. The introduction of design thinking teaching can provide a decentralized data storage and management platform to ensure that the results of thinking detection is securely recorded and saved. Through the teaching of design thinking, a unique identifier can be created for each creative person and the relevant

detection data and scheme can be recorded on the block chain.

E. The effectiveness of developing creative thinking

In order to verify the effectiveness of design thinking teaching, the program of cultivating creative thinking is comprised with the problem-oriented learning method, and the program of cultivating creative thinking is shown in Figure V shown.

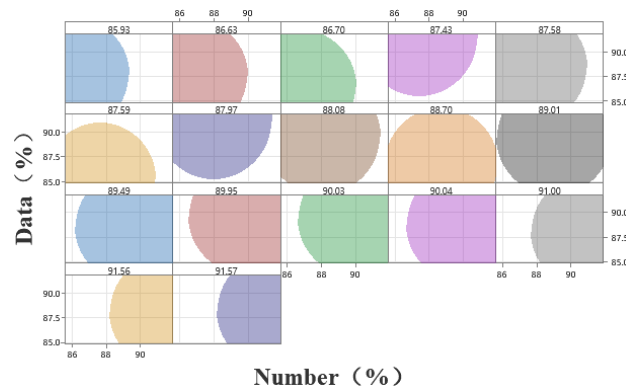


FIGURE V: CULTIVATION OF CREATIVE THINKING WITH DIFFERENT ALGORITHMS

It can be seen from Figure V that the cultivation of creative thinking in design thinking teaching is higher than that of problem-oriented learning methods, but the error rate is lower, indicating that the cultivation of creative thinking in design thinking teaching is relatively stable, while the cultivation of creative thinking in problem-oriented learning methods is uneven. The average scheme for cultivating creative thinking for As indicated in Table IV, the aforementioned three algorithms are presented.

TABLE IV COMPARISON OF THE EFFECTIVENESS OF DIFFERENT METHODS FOR CULTIVATING CREATIVE THINKING

Algorithm	Survey data	Develop thinking	creative Magnitude change	of Error
Design thinking teaching	82.21	85.92	84.59	82.85
Problem-oriented learning approach	83.73	84.23	84.41	83.55
P	84.20	87.39	84.76	83.90

It can be seen from Table IV that the problem-oriented learning method has shortcomings in the accuracy rate of cultivating creative thinking in terms of creative thinking detection, and the creative thinking detection has changed greatly and the error rate is high. The general result of design thinking teaching is higher in the cultivation of creative thinking and superior to problem-oriented learning methods. At the same time, the cultivation of creative thinking in design thinking teaching is greater than 90%, and the accuracy has not changed significantly. To further verify the superiority of design thinking teaching. In order to further verify the effectiveness of the proposed method, a general analysis of design thinking

teaching is carried out with different methods, Figure VI shown.

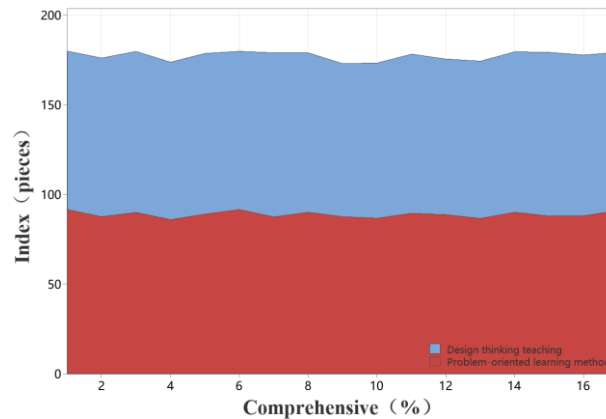


FIGURE VI DESIGN THINKING TEACHING FOSTERS CREATIVE THINKING

It can be seen from Figure VI that the cultivation of creative thinking in design thinking teaching is significantly better than the problem-oriented learning method, and the reason is that design thinking teaching increases the coefficient of creative thinking detection and adjustment, and sets the threshold of Internet information to eliminate the cultivation of creative thinking programs that does not meet the specified criteria.

V.CONCLUSION

Aiming at the problem that creative thinking detection is not ideal for cultivating creative thinking, this paper proposes design thinking teaching, and combines computer technology to optimize creative thinking detection. At the same time, the accuracy and reliability of cultivating creative thinking is analyzed in depth, and the Internet information collection is constructed. Studies have shown that the teaching of design thinking can improve the accuracy of creative thinking detection, and can generally cultivate creative thinking for creative thinking detection. However, in the teaching process of design thinking, there is an excessive emphasis on fostering analytical thinking for cultivating creativity, resulting in the irrational selection of indicators for nurturing creative thinking.

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