

# A Study on the Different Professional Curriculum Proportion Setting and Employment Relations in the College Game Design Courses

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**Key words:** game design; teaching model; game model

**Abstract:** in the research of different professional curriculum proportion setting and employment relations in colleges game design courses, due to the single designed curriculum content when using the current algorithm to make different professional curriculum proportion setting, the error of proportion setting is big. To this end, a design method based on the improved game theory is proposed to design the different professional curriculum proportion setting and employment relations in the college game design courses. in the method, it is from the corresponding point of view of game design course in colleges and different professional curriculum to set up revenue function firstly, and different cost function is established according to the game design course in colleges and the teaching content and direction of employment development of different professional curriculum, to design the game model of professional curriculum proportion setting and employment relationship on the basis of this, promoting the different professional curriculum proportion setting in game design courses in colleges, and through the game Nash equilibrium, it is converged to the direction of employment development trend, and effectively to complete the design of different professional curriculum proportion setting and employment relations in game design course in colleges finally. The experimental simulation shows that the design method for different professional courses proportion setting and employment relations in the college game design course based on the improved game theory has a high accuracy and good effect.

## 1 Introduction

With its function gradually perfect, the development of game industry not only accelerated the development and progress of the game design, but also play a guiding role to the development of the game design major<sup>[1-3]</sup>. But there is not a recognized and more perfect degree education system for game software major, and the training of the talents cannot meet the needs of the enterprise<sup>[4-6]</sup>. Therefore, how to effectively make the multi-major integration as the object of education, explore a practical way of training practical and comprehensive talents, has become the main problem to be solved in the game design course in college, which has caused the attention of many experts and scholars<sup>[7-9]</sup>.

Currently, the mainstream methods for the design of different curriculum proportion setting and employment relations in game design curriculum in colleges are based on genetic algorithm, particle swarm optimization algorithm and genetic algorithm<sup>[10]</sup>. Which is often used in the design method based on genetic algorithm. But the current algorithm has the problem of large error of proportion setting.

A study on the relationship between the proportion of different professional courses and the employment relationship in the course of game design in college

In view of the above problems, a new method of designing the proportion of different professional courses in college game design course based on the improved game theory is proposed. The method has high accuracy and good effect.

## 2 the design principle of the different professional courses proportion setting and employment in the game design course in colleges

The design principle of the different professional courses proportion setting and employment in the game design course in colleges can be formulated as follows:

(1) The combination of teaching content and market.

Game art design is different from other design professionals in common, the former is the design of the market survey as the premise, the design of people's aesthetic preferences for the fundamental, to expand the industrial design development for the purpose.

(2) The combination of teaching content and culture.

Colleges and universities in the game fine arts curriculum should enlarge the cultural significance, in teaching make students to deeply understand that the game has become the carrier of nowadays culture.

(3) The combination of practice teaching and employment direction.

Practical teaching needs to meet training objectives of the college game design major, and can effectively improve the students' professional competitiveness.

In the above conditions, the condition of  $\omega^T x_0 = 1$  can be obtained, and then the fractional programming of different professional curriculum proportion setting and employment relations design can be represented for  $(C^2R)$  in game design courses in colleges and universities, and the equivalent linear programming of different professional curriculum proportion setting and employment relations design in game design courses in colleges and universities can be represented for  $(pc^2R)$ , and the optimal values which are equal different professional curriculum proportion setting and employment relations design in game design courses in colleges and universities can be used to express by the following formula:

$$\max \mu^T y_0 = V_{C^2R} \quad (1)$$

### 3 the optimization principle of different professional courses proportion setting and the employment relationship design in the college game design course

#### 3.1 The establishment of the game model of different professional courses proportion setting and employment relationship optimization design

Firstly, it is from the corresponding point of view of different professional curriculum to set up revenue function, and different cost function is established according to the teaching content and direction of employment development of different professional curriculum, to design the game model of professional curriculum proportion setting and employment relationship on the basis of this. Specific steps are as follows:

Setting  $s$  is the category of professional courses related to the course of the game design,  $\gamma_{rid}$  represents the setting proportion of different professional courses and game design courses, the following formula can be used to complete the calculation of  $\gamma_{rid}$ :

$$\gamma_{rid} = \frac{p_r H_{ri,d} p_s H_{s,ri}}{\sigma^2 (p_r H_{ri,d} + p_s H_{s,ri} + \sigma^2)} \quad (2)$$

The revenue function of different professional courses proportion setting and college game design course is:

$$u_s = \left( \frac{1}{1 + \exp(-\alpha_s (\gamma_{s,d} - \beta_s))} \right) \quad (3)$$

Based on the above formula, it can establish the cost function of teaching content and the employment direction in different professional courses, it can be expressed by using the following formula:

$$u_{ri} = \left( \frac{1}{1 + \exp(-\alpha_{ri} (\gamma_{ri,d} - \beta_{ri}))} - \frac{c_{ri} p_{ri}}{p_{ri, \max}} \right) \quad (4)$$

The below formula can be used to obtain the utility function of teaching content and employment

development direction of the college game design course:

$$p_s^* = \arg \max_{ps} u_s(p) \quad (5)$$

Based on the establishment of the game model of different professional courses proportion setting and employment relationship optimization design in college game design courses, it can be expressed by the following formula:

$$p_{ri}^* = \arg \max_x x u_{ri}(p)$$

In the upper formula, in order to make the  $p$  have a unique Nash equilibrium, to order

$$p = [p_s, p_{r1}, \dots, p_{rN}] \quad (6)$$

### 3.2 The principle optimization to realize of different professional courses proportion setting and employment relationship design in the college game design course

Assuming a  $n$  game design professional positioning unit  $DMU_1, DMU_2, \dots, DMU_n$ , each  $DMU$  have  $m$  game design curriculum categories and  $s$  species different professional courses related to game design courses,  $DMU_j$  employment development prediction vectors are respectively  $x_j = \{x_{1j}, x_{2j}, \dots, x_{mj}\}^T$ ,  $y_j = \{y_{1j}, y_{2j}, \dots, y_{sj}\}^T$ . assuming that the employment direction  $DMU_{j0}$  can be represented as  $(x_{j0}, y_{j0})$ , and denoted as  $(x_0, y_0)$ , then the use of the below formula, it can be built the equilibrium model of different professional curriculum proportion setting and employment relations in game design courses in colleges:

$$\begin{cases} \max \frac{\mu^T y_o}{v^T x_o} \\ \frac{\mu^T y_o}{v^T x_{oj}} \end{cases} \quad (7)$$

## 4 experimental simulation

In order to prove the effectiveness of the proposed method based on the improved game theory, an experiment is needed. Simulation platform is built by Matlab simulation software. The experimental data collected from the actual data of a practical curriculum system setting and employment management system in a college game design major. In the selected data set, it contains five years of data, the first four years of data are as test data, and the fifth year of employment direction data are as a pre measured data. The improved algorithm, particle swarm optimization algorithm and genetic algorithm are respectively used for accuracy prediction, error rate comparison, to measure the effectiveness of the design of different algorithms, the comparison results are shown in table 1.

Table 1 accuracy comparison of different algorithms

Test data set	Improved algorithm		particle swarm optimization		genetic algorithm	
	Prediction accuracy (%)	Error rate (%)	Prediction accuracy (%)	Error rate (%)	Prediction accuracy (%)	Error rate (%)
1	97	0.001	86	0.2	73	0.5
2	98	0.001	83	0.3	75	0.6
3	97	0.001	80	0.2	74	0.8
4	97	0.001	83	0.3	75	0.5
5	96	0.001	94	0.5	73	0.5

It can be seen from table 1, the experimental accuracy of using the improved algorithm for different professional curriculum proportion setting and employment relations design is better than the other algorithms, mainly because that in the improved algorithm, it is from the corresponding

point of view of game design course in colleges and different professional curriculum to set up revenue function firstly, and different cost function is established according to the game design course in colleges and the teaching content and direction of employment development of different professional curriculum, to design the game model of professional curriculum proportion setting and employment relationship on the basis of this, promoting the different professional curriculum proportion setting in game design courses in colleges, and through the game Nash equilibrium, it is converged to the direction of employment development trend, and effectively to complete the design of different professional curriculum proportion setting and employment relations in game design course in colleges finally.

## 5 Conclusions

Direct at the problem of that the single designed curriculum content when using the current algorithm to make different professional curriculum proportion setting, the error of proportion setting is big, a method based on the improved game theory is proposed to design the different professional curriculum proportion setting and employment relations in the college game design courses. In this method, it is from the corresponding point of view of game design course in colleges and different professional curriculum to set up revenue function firstly, and different cost function is established according to the game design course in colleges and the teaching content and direction of employment development of different professional curriculum, to design the game model of professional curriculum proportion setting and employment relationship on the basis of this, promoting the different professional curriculum proportion setting in game design courses in colleges, and through the game Nash equilibrium, it is converged to the direction of employment development trend, and effectively to complete the design of different professional curriculum proportion setting and employment relations in game design course in colleges finally. The experimental simulation shows that the design method for different professional courses proportion setting and employment relations in the college game design course based on the improved game theory has a high accuracy and good effect.

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