

Practical of Cultivating Innovative and Entrepreneurial Talents Based on Deep Learning Model

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Abstract: With the continuous advancement of sustainability theory and market economy, the contradiction between supply and demand in the talent market continues to deepen. Universities take on the important duty of education development and talent cultivation. In the cultivation procedure of innovative and entrepreneurial talents, the teaching objectives should be implemented both in line with supply and demand and from the perspective of the practical evolution demands of society. At present, most universities overlook the importance of disciplinary and professional practice, resulting in the establishment of disciplines and specialties being unable to actively accommodate the requests of economic growth. In order to improve the effect of innovation and entrepreneurship practice and promote the scientific cultivation of talents, this paper conducted in-depth research on the basis of analyzing the growth of theory and practice, and combined with the deep learning model. For demonstrating the role and impact of the deep learning model on the role and influence of the deep learning model in improving the effect of practical, this paper made an experimental analysis from the perspective of teaching diversity and students' entrepreneurial ability, and compared it with traditional practical teaching. The experimental results showed that under the deep learning model, 68% and 74% of the students had better entrepreneurial knowledge satisfaction and entrepreneurial practice ability. From this data, it can be seen that practical teaching of talent cultivation based on deep learning models can promote the growth of students' entrepreneurial abilities, which is conducive to the cultivation of innovative and entrepreneurial talents.

1. Introduction

In the current situation of widespread labor shortage in society, the development situation of the employment market is also becoming increasingly severe. The sustainability of cultivating innovative and entrepreneurial talents is gradually receiving attention from all sectors of society. At present, most schools have formed their own talent training mode. The construction of curriculum system has been gradually improved, which has promoted the formation of students' entrepreneurial awareness and spirit to a certain extent. However, with the continuous development of innovation and entrepreneurship education, the problems and contradictions are gradually emerging. The

traditional entrepreneurship education system generally takes the theoretical guidance as the principal instruction pattern, which causes a large gap between the talent training level of colleges and the actual social development level. In practical work, students lack practical experience and are difficult to link theory and practice. Therefore, the construction of a scientific practical instruction system is the crucial to cultivating talents in universities in the future. Following the advancement of deep learning, the adoption of deep learning models in a diverse range of professional fields is becoming more widespread. Deep learning model has strong computing power. In the training of talents in universities, it can effectively extract the demand characteristics of market talents. It is of great value to improve the teaching effect and cultivate students' practical and creative skills by designing practical teaching through the association between nodes.

Against the backdrop of fierce competition in the talent market, the cultivation of innovative and entrepreneurial talents has gradually become a key direction for the development of higher education. Miller D J believed that a university campus could be seen as an entrepreneurial ecosystem. Its education and teaching could provide students with available assets, freedom and development diversity, and create opportunities for students to cultivate their entrepreneurship and innovation spirit [1]. Zhu H B recapped the fundamental conditions of innovation and entrepreneurship education in Chinese universities from 2010 to 2015, and reflected on the shortcomings of current education [2]. Huang Saad A provided a platform for the teaching, dissemination and integration of innovation and entrepreneurship content, which affected college students' understanding and experience of entrepreneurship, and helped them cultivate entrepreneurial characteristics and entrepreneurial mentality [3]. Heaton S proposed a dynamic capability framework to guide the practical teaching of university innovation and entrepreneurship talent training, and used case studies to illustrate the implementation of its teaching concept [4]. To some extent, these studies have promoted the growth of students' understanding of innovation and entrepreneurship theory. However, most of them focus on theoretical instruction and lack practical instructional achievements.

The deep learning model can learn effective feature representation through large-scale data to increase the effectiveness of practical instruction. Ilonen S determined the emotional learning achievements of students in talent training practice teaching according to the classification of emotional learning achievements of the deep learning model. He deeply investigated and understood the goals and ideas of innovation and entrepreneurship teaching in universities [5]. Nelson N N used a combination of quantitative and qualitative approaches of deep learning model to investigate college students. He found that entrepreneurship teaching was a positive factor affecting students' entrepreneurial willingness [6]. With the increasing demand for innovation and entrepreneurship talents in the market, the quality of innovation and entrepreneurship talent cultivation also needs to be continuously optimized. Therefore, the practical analysis of innovative and entrepreneurial talent cultivation based on deep learning models is very important.

Through a deep learning model, this article conducts in-depth research on the cultivation of innovative and entrepreneurial talents, and compares it with traditional practical methods. According to experimental data, the scores of innovation and entrepreneurship talent cultivation based on deep learning model in teaching mode, methods, means, and resources are 81.44, 83.21, 81.05, and 85.51, respectively. The scores of traditional practical teaching were 72.16, 77.14, 72.39 and 70.84 respectively. It can be seen that the diversity of practical teaching under the method of this paper was strong. The number of students who have reached a good level or above in the evaluation of entrepreneurial knowledge satisfaction and entrepreneurial practical ability under the in-depth learning model practice teaching accounted for 68% and 74% of the total number respectively. However, 52% and 64% of the students in the general and unqualified levels of entrepreneurial knowledge satisfaction and entrepreneurial practical ability evaluation in traditional

practical teaching respectively accounted for the total number. These data show that the practical instruction effect of talents training in universities based on the deep learning model is more ideal.

2. Cultivation of Innovative and Entrepreneurial Talents

2.1 Overview of Innovation and Entrepreneurship Talents

Innovation and entrepreneurship talents refer to those who are based on innovation ability and have certain entrepreneurial quality [7]. For innovative and entrepreneurial talents, the most fundamental thing to make entrepreneurial activities sustainable and benign is to have good management ability. Entrepreneurship quality is the premise of entrepreneurship, which can stimulate entrepreneurial desire and lead entrepreneurial practice [8]. Only when people have a sufficient understanding of entrepreneurship can they have the need to start a business. With a strong entrepreneurial need, they effectively stimulate their entrepreneurial motivation and generate entrepreneurial desire driven by strong entrepreneurial motivation. With entrepreneurial quality and entrepreneurial desire, there is entrepreneurial behavior. To ensure the correct development of entrepreneurial practice, it is necessary to have good entrepreneurial knowledge. The entrepreneurial quality of college students drives them to enrich their entrepreneurial knowledge.

2.2 Practical of Talent Cultivation

The practice of talent cultivation mainly focuses on teaching. The practical instruction of cultivating innovative and entrepreneurial talents in universities is an instructional mode that takes the idea of entrepreneurship education as the purpose and takes enhancing the entrepreneurial quality and ability of college students as the main teaching task [9]. During the instructional process, it is expected to build a reasonable curriculum framework and enable learners to conduct entrepreneurial practice activities in a specially designed entrepreneurial practice site under the leadership of teachers. This teaching mode is guaranteed by the entrepreneurship education system. As a whole concept, the college students' entrepreneurship education system is relatively stable in its constituent elements.

(1) Entrepreneurship course system

The teaching practice of innovation and entrepreneurship takes the curriculum system as the main carrier. The curriculum content is the center, and its talent training goal mainly depends on the entrepreneurship curriculum system to achieve. While teaching entrepreneurial knowledge, entrepreneurial management and related knowledge should also be taught to enable them to have basic entrepreneurial knowledge, basic theories and basic methods. Entrepreneurship is a competition of intelligence and ability, which requires both deep professional foundation and extensive knowledge reserves. More attention should be paid to the absorption and integration of knowledge in different fields [10].

(2) Entrepreneurship guidance and training

Entrepreneurship guidance and training is the key to successful implementation of entrepreneurship education. The focus is on the organization and construction of entrepreneurial teacher team. The excellent team of entrepreneurship teachers can timely and efficiently impart the theory and practical experience of entrepreneurship to learners, so that they can develop in the right direction towards the training goal.

(3) Practice system

Innovation and entrepreneurship education should focus on "three innovations" (innovation, innovation and entrepreneurship), and carry out specific practice of entrepreneurship education based on various forms of activity carriers and practice bases inside and outside the campus [11]. Its

system composition is shown in Figure 1.

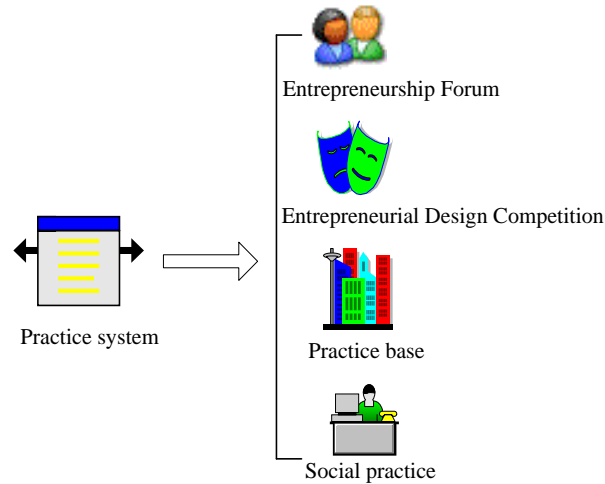


Figure 1: Legend of practice system

(4) Theoretical research system

The theoretical research system is the entrepreneurial practice experience summarized from entrepreneurial practice. On the whole, the content of entrepreneurial theory system includes entrepreneurial motivation, entrepreneurial demand, entrepreneurial resources and entrepreneurial enterprise system. Its knowledge structure has strong practicality and guiding significance, so it needs to keep pace with the times and meet the needs of development.

In recent years, the practical teaching reform carried out by various schools has not only improved students' entrepreneurial awareness and ability to a certain extent, but also makes students' entrepreneurial spirit develop in depth, which has laid a favorable basis for training innovative talents [12]. However, the practical instruction reform in universities is still in the primary phase of exploration. There are still several issues, which are divided into four parts in this paper.

(1) Unclear teaching objectives

Most universities are not clear about their professional practice teaching objectives, which leads to the fuzziness of applied talent training [13].

(2) Unscientific curriculum system

Although the teaching practice has experienced reform and innovation, the existing curriculum system still continues or applies the traditional curriculum structure system. This three-stage curriculum system model of basic courses, specialized basic courses and specialized courses is contrary to the talent training model, which is not suitable for training technical and innovative talents.

(3) Lack of overall planning

Many universities have made the design and development of instructional activities central to the construction of their practical instructional systems. The school has set up a diversity of practical instructional activities and sessions such as experiments, practical exercises and practice. Each link has a more reasonable time setting. However, each activity and link is lack of order and cannot be organically linked together. This falls somewhat short of the goal of developing entrepreneurial talent. Moreover, practical teaching is a relatively independent education system [14].

(4) Neglect the construction of comprehensive evaluation system

Many universities attach great importance to the reform of examination contents and methods, but ignore the test and assessment of professional ability. It is common to place more emphasis on

knowledge than ability [15].

2.3 Deep Learning Model

Over the last few years, the deep learning model has been growing rapidly, which has made great progress in all aspects. This method is derived from neural network. It constructs a high-level abstract expression through the combination of low-level features, and converts high-dimensional data into a mapping function of low-dimensional features to achieve efficient expression, as shown in Figure 2. The application of the depth model in the current practical instruction of talents training in universities can be seen as a transformation process of a node's manifestation from a high-dimensional network to a low-dimensional space. The essence of this process is to learn the relationship between two vector spaces.

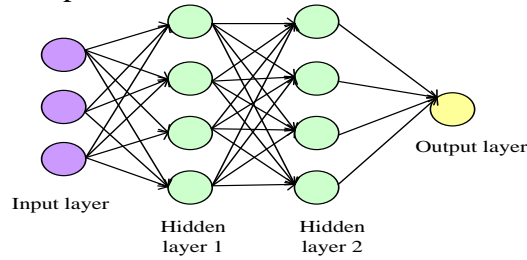


Figure 2: Legend of deep learning model

In the deep learning model, matrix decomposition is a method to reduce the dimension of the original matrix to the product of two or more matrices, which is usually used to fill some sparse matrices. In teaching practice, the goal of matrix decomposition is to decompose the sparse item score matrix from previous practice teaching into two matrices. One is the innovation and entrepreneurship theory matrix, which represents the potential characteristics of the theory. The other is the teaching matrix, which represents the potential characteristics of the teaching process. Finally, theoretical latent eigenvectors and teaching latent eigenvectors are used for inner product, so as to combine innovation and entrepreneurship theory with teaching practice.

$$\hat{y}_{u,i} = f(u, i | p_u, q_i) = p_u^T q_i \quad (1)$$

q_i, p_u represent theoretical potential eigenvectors and teaching practice potential eigenvectors respectively. $\hat{y}_{u,i}$ is the correlation between the two, which is generally reflected in the prediction effect of practical teaching of entrepreneurial talent training.

At the same time, the score of teaching effect is expressed by the inner product of theoretical potential feature vector and teaching practice potential feature vector, so as to fill in the sparse matrix:

$$\bar{y}_{u,i} = p_u^T q_i \quad (2)$$

In general, for a class of teaching objectives i , its potential feature vector is q_i . Each element value of the vector represents the support degree of the target to the feature. Similarly, for a teaching practice activity u , its eigenvector is p_u^T .

In the model, in order to obtain such eigenvectors, the model minimizes the square error with a regular term. It is expressed as:

$$\min \sum (\hat{y}_{u,i} - p_u^T q_i)^2 + \lambda (\|q_u\|^2 + \|p_i\|^2) \quad (3)$$

In the frame, m is represented as a special case of the generalized matrix factorization (GMF) belonging to the frame. A broader GMF model is defined as: the input of the model is a code of

theory and teaching practice, which is mapped into a word vector through the Embedding layer and expressed as the potential feature vector of teaching practice p_u and the feature vector of teaching theory q_i .

The product of potential feature vector p_u in teaching practice and potential feature vector q_i in theory is expressed as the correlation between them:

$$\delta(p_u, q_i) = p_u \cdot q_i \quad (4)$$

Finally, the final predicted value is mapped through the output layer:

$$\bar{y}_{u,i} = \alpha(w(\delta)) \quad (5)$$

Among them, w represents the weight value of the output layer, and α represents the activation function of the output layer. Compared with the real value, the weight value is updated by means of back propagation.

In the deep learning model, this paper applies the linear kernel to simulate the interaction between features, as shown in Figure 3.

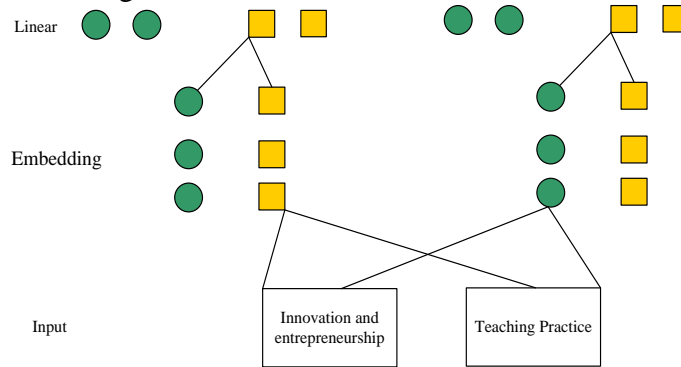


Figure 3: Model interaction legend

3. Innovation and Entrepreneurship Talent Training Practice

In order to test the role of deep learning mode in the cultivation of innovative and entrepreneurial talents, this article conducts a practical analysis of the innovation and entrepreneurship course for fourth year students majoring in logistics management in a certain university based on this method. In order to realize the teaching effect, 100 students are randomly selected and divided into two groups: Group A and Group B. There are 50 students in Group A and 50 students in Group B. The two groups of students have a total of 12 weeks of innovation and entrepreneurship practice teaching. Group A adopts the practical teaching method assisted by the deep learning mode. Group B adopts the traditional practical teaching method. The fundamental components of practical instruction are listed in Table 1.

Table 1: Basic content of practical teaching

Sequence	Item	Information
1	Course name	Fundamentals of Entrepreneurship
2	Course type	Practice class
3	Credit	2
4	instructional objective	Cultivate students' entrepreneurial awareness and ability

In order to ensure the effectiveness of practical teaching, this paper tests and hypothesis tests the theoretical cognitive level and basic practical ability level of students in Group A and Group B. The

total scores of the two tests are 50 respectively. The test and hypothesis test results of the two groups of students are shown in Table 2.

Table 2: Test and hypothesis test results

Classification	Item	Result
Group A	Theoretical cognitive level	34±7.82
	Basic practical ability level	31±4.44
Group B	Theoretical cognitive level	33±7.97
	Basic practical ability level	31±5.02
Inspection results	P value	0.0312

It can be seen from Table 2 that the P-value test result of the two groups of students in the theoretical cognitive level and basic practical ability level test is 0.0312, indicating that there is no significant difference between the two groups of students in the basic ability of course learning.

(1) Teaching diversity

Entrepreneurial education is an important educational model for innovative talent training objectives, and it is a combination of diversified and multi-level instruction and practice. This paper evaluates the innovation and entrepreneurship practice teaching and the traditional practice teaching under the deep learning from the four perspectives of practice teaching mode, method, means and resources. The weight and scoring standard are determined by Delphi method, and the full score is 100 points. The results of the two practical teaching evaluations are shown in Figure 4.

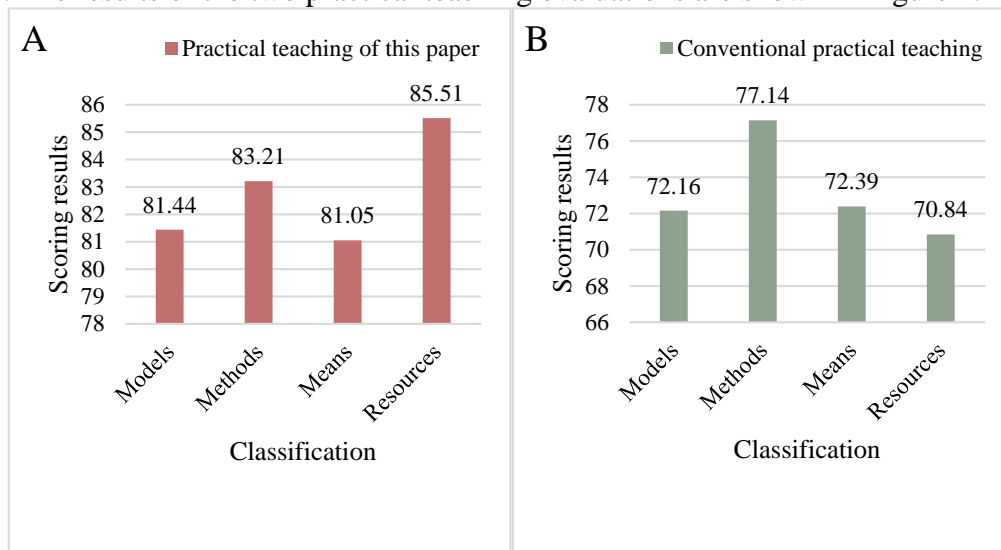


Figure 4A shows the practical teaching of this article

Figure 4B shows traditional practical teaching

Figure 4: Evaluation of teaching diversity

As shown in Figure 4, there is an obvious gap between the traditional practical teaching and the innovation and entrepreneurship practical teaching under this method in terms of teaching mode, methods, means and resources. In Figure 4A, the scoring results of practical teaching based on the deep learning model in the four aspects of teaching mode, method, means and resources are respectively 81.44, 83.21, 81.05 and 85.51. Among them, practical teaching resources have the highest score. In the deep learning model, the input layer can not only add theoretical teaching content, but also constrain the parameter adjustment in the model to add other teaching activities or resources that are highly related to entrepreneurial practice. In practical teaching, the deep learning model extracts innovation and entrepreneurship features from market development information,

extracts practical curriculum features from theoretical teaching content, which is added to the network for training to obtain the final output. This not only maximizes the diversity of teaching, but also effectively guarantees the teaching effect. In the traditional practical teaching of Figure 4B, the scores of teaching diversity are 72.16, 77.14, 72.39 and 70.84 respectively. Only from the score data, the traditional practical teaching is relatively simple and boring. It is not effective in ensuring the diversity and flexibility of students' credit access and promoting the maximum development of students' entrepreneurial ability.

(2) Entrepreneurship

In addition to ensuring the diversity of teaching, the practical teaching of cultivating innovative and entrepreneurial talents in universities also needs to promote the entrepreneurial ability of students to cultivate their entrepreneurial ability, as well as cultivate their creativity and various skills required for work, which is also essential for improving the employability of college students. After 12 weeks of practical instruction, this paper evaluates the satisfaction of entrepreneurial knowledge and entrepreneurial practice ability of the two groups of students. Similarly, the Delphi method is used to determine weights and evaluation criteria. The assessment scale is categorised into four levels: very good, good, average and unqualified. The analysis results of the two kinds of practical teaching are shown in Figure 5 and Figure 6.

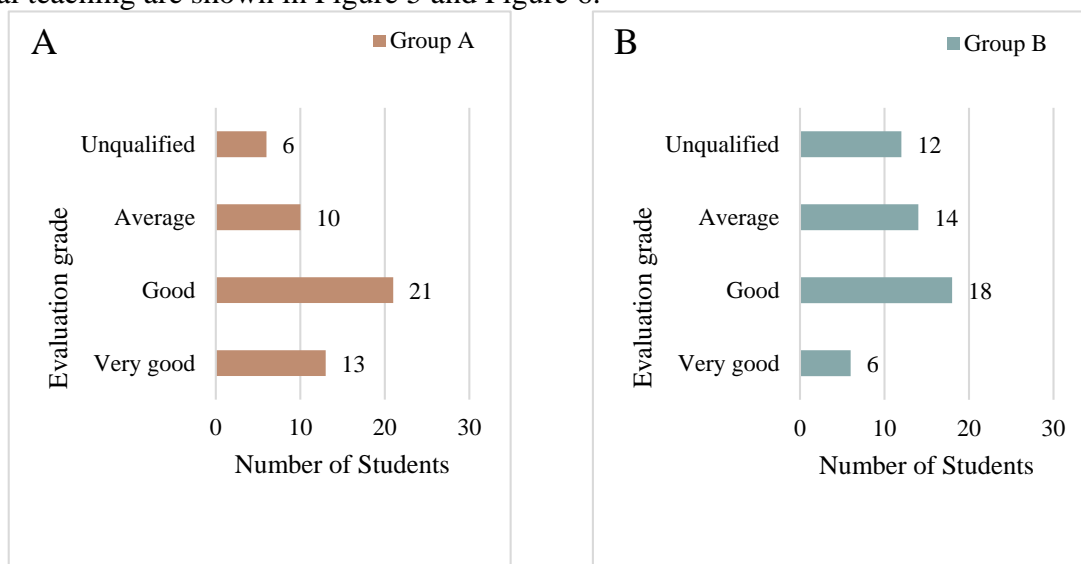


Figure 5A shows students in Group A

Figure 5B shows students in Group B

Figure 5: Analysis of entrepreneurial knowledge satisfaction

From the overall analysis results of entrepreneurial knowledge satisfaction in Figure 5, students in Group A should perform better after practical teaching. In Figure 5A, there are 13 people with very good entrepreneurial knowledge satisfaction. There are 21 people who have reached a better level. For general and unqualified grades, there are 10 and 6 persons respectively. In terms of the proportion of data, 68% of the students in Group A have a good level of entrepreneurial knowledge satisfaction or above. In Figure 5B, the number of students with good grades and above accounts for 48% of the total. The number of students with average and unqualified grades accounts for 52% of the total. From this perspective, the innovation and entrepreneurship practice teaching effect under the deep learning model is obviously better than the traditional practice teaching. Under the deep learning model, practical teaching mainly focuses on the relationship between students and the entrepreneurial market, rather than the relationship between students and entrepreneurial theory. This has improved the students' acceptance of entrepreneurial practical knowledge to a certain extent. In addition, the deep learning model can use the teaching method of combining theory with

actual development to carry out practical teaching, which can expand students' entrepreneurial knowledge contact, thus improving their entrepreneurial knowledge satisfaction.

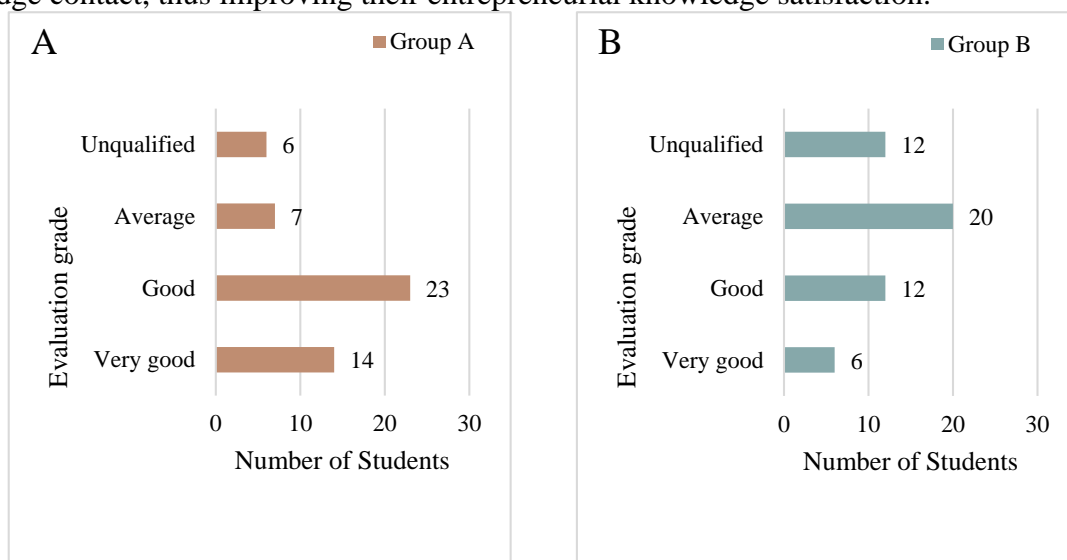


Figure 6A shows students in Group A

Figure 6B shows students in Group B

Figure 6: Analysis of entrepreneurial practice ability

As an extension of vocational education, practice teaching focuses on the cultivation and practice of skills, and its core is to cultivate students' entrepreneurial practice ability. In Figure 6A, students in Group A perform well in entrepreneurship practice under the innovation and entrepreneurship teaching practice based on the deep learning model. Among them, there are 14 students with very good grades, 23 students with good grades, 7 students with general grades and 6 students with unqualified grades. From the perspective of proportion, 74% of the total number of students with entrepreneurial practice ability is at or above a good level. In the traditional practice teaching of Figure 6B, only 6 students in Group B have excellent entrepreneurial practice ability. There are 12 people who have reached a good level, 20 people who have reached a general level and 12 people who have reached an unqualified level. From the perspective of proportion, the number of students with ordinary entrepreneurial practice ability and unqualified grades reaches 64% of the total number. It can be seen that the traditional practical teaching cannot meet the needs of contemporary college students to improve their entrepreneurial ability. The knowledge imparted by the entrepreneurship course is not integrated with the professional knowledge learned, resulting in the students' insufficient entrepreneurial practice ability and the inability to apply what they have learned. In the deep learning model, the integration of entrepreneurial knowledge and professional knowledge is realized, which significantly improves the effectiveness of innovation and entrepreneurship talent training.

4. Conclusion

With the continuous deepening of the reform of higher education, elite education has been gradually developing towards popularization. While talent competitiveness has been greatly improved, it has also raised the threshold for college students to enter the employment market. In the process of cultivating innovative and entrepreneurial talents, a sustainable practice system model is an important carrier of talent cultivation, which is of great significance for achieving the cultivation of innovative and entrepreneurial talents in universities. This paper optimizes and improves current innovation and entrepreneurship practices based on a deep learning model.

Compared with the traditional practice teaching, the practice teaching mode, method, means and resources of innovation and entrepreneurship talents training in universities based on the deep learning model are more diversified. Students' entrepreneurial knowledge satisfaction and entrepreneurial practice ability are more ideal. Although this research has some achievements in improving the practical teaching effect of innovation and entrepreneurship in universities, there are still many deficiencies. In future research, it is necessary to continuously improve the effectiveness of cultivating innovative and entrepreneurial talents, in order to further improve the talent cultivation system.

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