



Innovation and Entrepreneurship Education (IAEE) Driven by Artificial Intelligence (AI)

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Abstract:

With the continuous development and progress of society, the value of scientific and technological innovation and entrepreneurship is becoming more and more obvious; In the process of innovation and entrepreneurship, schools have created a lot of social wealth for the society, and there is an urgent need to study the cultivation mechanism of innovation and entrepreneurship. Focusing on the research of IAEE driven by AI, this paper discusses and analyzes the application of AI in IAEE and the challenges of the application of AI in IAEE, and puts forward the natural language processing algorithm of AI; In order to verify the teaching effect of IAEE driven by AI, this paper makes an experimental comparison between the students' Entrepreneurship learning effect under the traditional mode and the AI teaching mode. The test results show that AI teaching provides a more favourable condition for IAEE, and fully proves the feasibility and effectiveness of IAEE driven by AI.

Keywords: *Artificial intelligence, technology driven, innovation and entrepreneurship, entrepreneurship education*

1 INTRODUCTION

The application of AI in teaching is still in the initial stage. In order to better integrate AI into innovation and entrepreneurship teaching, this paper studies the possible changes in teaching and how to change in combination with the technical advantages of educational AI, and discusses the application countermeasures of AI in IAEE, which will help to inspire the application ideas of AI teaching. It has guiding significance for using AI to optimize the educational process and improve the success rate of students' Entrepreneurship in the future.

Many scholars at home and abroad have studied the IAEE driven by AI. Oliveira [1] problem based learning (PBL) is described as a teaching method that promotes interdisciplinary and critical thinking and has the potential to meet current challenges. Describes how PBL, combined with innovative projects and competitions, is integrated into the master's degree in food engineering to promote academic entrepreneurship. The consistency of PBL with projects and competitions allows the development of innovative products to solve the problems faced by the agro food sector. In this way, it is possible to promote the innovation of the agricultural

food sector and stimulate the entrepreneurial spirit of higher education students [1]. F. J. Cantú - Ortiz introduced the latest development strategy of AI (AI) in the field of education and a case study on cultivating students with the abilities and skills required for the current and future digital transformation to industry 4.0. The goal of the project is to support higher education institutions to establish courses, provide qualified human capital for enterprises and help them meet the challenges of the 21st century, which have brought about the working environment now known as industry 4.0 or the fourth industrial revolution [2].

AI has brought new models and new ideas to solve some problems existing in the process of traditional entrepreneurship education. Combined with the background of the rapid development of AI, this paper systematically discusses the new influence and reform brought by the application of AI in innovation and entrepreneurship teaching; The detailed system framework analysis of the application of AI technology in teaching will have enlightenment for the teaching reform in the new era. Research and explore the effectiveness of AI in supporting intelligent evolutionary teaching resources, intelligent push teaching resources and intelligent retrieval teaching resources, meet the

needs of learners for ubiquitous access to personalized resources, and provide some guidance for the intelligent upgrading and transformation of teaching resources [3]

2 IAEE DRIVEN BY AI

2.1 Application of AI in IAEE

In the teaching environment, machine learning can intelligently mine and analyze a large number of teaching data, discover new patterns, and predict students' learning performance and achievement, so as to promote and improve learning. It can be said that in the process of data learning, the more data the machine processes, the more accurate the prediction will be. Teaching data includes the data generated by the interaction between learners and teaching system.

Prediction and clustering are widely used. Prediction aims to establish a prediction model to predict unknown data from current known data. In teaching application, the commonly used prediction methods are classification and regression, which are generally used to predict students' learning performance and detect learning behavior. Clustering is generally used to find unknown classifications in the data set. In innovation and entrepreneurship teaching, students are usually grouped based on teaching data [4].

Cloud computing expands the sharing of educational resources: through cloud computing, students' learning resources and teachers' lesson preparation resources can be shared in the cloud. The intelligent teaching platform with powerful computing function and massive resources can effectively solve the problems of repeated investment of resources and information island in the construction of current network teaching platform. In addition, learners can obtain required learning resources and services from the cloud through network connection.

2.2 Characteristics of AI teaching robot in the field of IAEE

Pedagogy: teaching robots should have extensive knowledge reserves, have the ability of self-learning and self evolution, and be familiar with the latest scientific and technological development achievements. Like a real teacher, it can understand its own learning problems, its own teaching methods and the problems existing in the knowledge layer of the discipline. By observing and recording the students' learning situation, it can constantly adjust the teaching strategies, realize the transformation from the traditional single form and experience led way to man-machine cooperation, achieve the accurate and personalized teaching of timely data sharing and in-depth mining, and truly complete the professional requirements of teachers such as preaching, receiving and dispelling doubts.

2.2.1 Natural language processing in AI

Suppose there is a meaningful sentence a , which is composed of n words in a specific order, $v_1, v_2, v_3, \dots, v_{n-1}, v_n$ is the word that makes up the sentence, then $a = v_1, v_2, v_3, \dots, v_{n-1}, v_n$, assuming that the occurrence probability of any word v_n only depends on the word v_{n-1} in front of it, we should first determine a training corpus, obtain the number of occurrences of a binary grammar according to this corpus, and then normalize it. Equation (1) (2) is obtained according to the definition:

$$F(v_n | v_{n-1}) = \frac{G(v_{n-1}v_n)}{\sum_v G(v_{n-1}v)} \quad (1)$$

$$F(A) = \{v_1 | v_1, v_2, v_3, \dots, v_n, v_{n+1}\} \quad (2)$$

Autonomy: teaching robots should have the ability of perception and thinking, timely and accurately analyze the state of teachers and students, and make independent decisions.

Interactive friendliness: in the process of communicating with students, robots should be humorous and interesting, and can attract students' interest. As a learning partner, the teaching robot should be able to conduct barrier free man-machine communication, complete question answering and provide learning

Blending virtual reality: the intelligent teaching platform connects virtual reality and promotes learners to combine learning with practice. With the development of AI, virtual reality technology is more "intelligent". AI can improve the effect of virtual space and bring better user experience [5].

2.3 Characteristics of Artificial Intelligence Applied to Innovation and Entrepreneurship Education

High innovation: the technical ability and R & D strength of the entrepreneurial team of artificial intelligence projects are the prerequisite for the competitiveness of enterprises; **High difficulty:** artificial intelligence projects often have their own unique technical level. Whether this technical level is easy to be copied by other companies is also a major factor to be considered by investors. **Wide application fields:** due to its unique ability to combine with other industries, artificial intelligence projects are mostly in the initial stage. For investors, enterprises in the initial stage have great investment risks and need to consider many factors: first, investors need to judge an entrepreneur and his team's combat effectiveness from many aspects such as personality and experience, This is because most of the entrepreneurial teams in the initial stage have not

experienced complete business operation experience; Second, when judging the market competition and other core competencies of start-ups, investors need to deeply and comprehensively analyze the market capacity, market barriers, competitors and other aspects of the project. Third, most investors only have a plan when they understand the start-up, but the progressiveness and substitutability of business model and product technology are all the aspects that investors pay attention to.

In the field of innovation and entrepreneurship education, artificial intelligence teaching should have the following characteristics. **Autonomy:** artificial intelligence teaching has the ability of perception and thinking, can timely and accurately analyze the status of teachers and students, and can make independent decisions. **Interactive friendliness:** in the process of communicating with students, it should be humorous and interesting to attract students' interest. As a learning partner, the teaching robot should be able to communicate with obstacle free man-machine, answer questions and provide learning. **Blending virtual reality:** the intelligent teaching platform connects virtual reality and promotes learners to combine learning with practice. With the development of artificial intelligence, virtual reality technology is more "intelligent". Artificial intelligence can improve the effect of virtual space and bring better user experience.

3 ADVANTAGES AND CHALLENGES OF AI

3.1 Advantages of AI

Intelligent teaching platform can collect massive data. The intelligent teaching platform can also play the role of behavior monitoring for comparative analysis. For students with weak entrepreneurial skills, through the learning data, we can find out when they began to relax, whether they were unwilling to learn from beginning to end, or retreat from difficulties in the learning process, and clearly grasp when the learners' learning attitude has changed. And it can observe the effective utilization of learners in the process of practice after learning entrepreneurial theoretical knowledge.

Blending virtual reality: the intelligent teaching platform connects virtual reality and promotes entrepreneurial learners to combine theory with practice. With the development of AI, virtual reality technology is more "intelligent". AI can improve the effect of virtual space and bring better user experience.

High efficiency: high efficiency is a remarkable feature of intelligent teaching platform. From before, during and after class, teaching through intelligent teaching platform is more efficient in all links, smoother in teaching process, deeper and timely in teaching

interaction and more obvious in teaching effect than traditional teaching [6].

Personalization: the modern education mode is "standardized teaching + standardized examination". The talents trained on the "assembly line" are not competitive. Compared with teaching students the simple technology that may be replaced by robots, we should try to cultivate the innovation and creativity that robots cannot replace. This means that the orientation of education should shift from standardization to non standardization [7] [8].

3.2 Challenges of applying AI to IAEE

High innovation: the technical ability and R & D strength of the entrepreneurial team of AI project are the premise and guarantee of enterprise competitiveness.

High difficulty: AI projects often have their unique technical level. Whether the technical level is easy to be copied and imitated by other companies is also the main factor to be considered by investors.

It has a wide range of applications. Due to its unique ability to combine with other industries, AI projects are mostly in the start-up stage. For investors, enterprises in the start-up stage have large investment risks, and more factors need to be considered: first, investors need to judge the combat effectiveness of an entrepreneur and his team from many aspects such as personality and experience, because most of the entrepreneurial teams in the start-up stage have not experienced complete business operation experience; Second, when judging the market competition and other core competencies of start-ups, investors need to deeply and comprehensively analyze the market capacity, market barriers, competitors and other aspects of the project. Third, most investors only have a plan when they understand the start-up, but the progressiveness and substitutability of business model and product technology are all the aspects that investors pay attention to. Whether new products can meet the requirements of consumers and be accepted by customers is also an important factor that enterprises need to consider. The growth evaluation of investment projects is mainly from the aspects of entrepreneurial team, market situation and product situation [9].

The challenge of applying AI to IAEE can be analogized according to the language processing algorithm. According to the assumptions in Section 2, there is an n-ary grammar model. For general n-ary grammars, the formula of parameter estimation is shown in formula (2)

$$F(\mathbf{v}_n | \mathbf{v}_{n-N+1}^{n-1}) = \frac{G(\mathbf{v}_{n-N+1}^{n-1})}{G(\mathbf{v}_{n-N+1}^{n-1})} \tag{3}$$

Correspondingly, when $n > 2$, the probability calculation formula of the sentence is shown in formula (3):

$$F(A) = \prod_{H=1}^{H+1} F(v_h | v_{h-n+1}^{h-1}) \tag{4}$$

In the sentences generated by ternary grammar and quaternion grammar, due to the connection with more

words in front of the word, the coherence of the sentence begins to improve. The longer the context of the training model, the better the coherence of the sentence.

4 EXPERIMENTAL TEST AND ANALYSIS

In order to verify the teaching effect of IAEE driven by AI, this paper compares the entrepreneurial learning effect of students learning under the traditional teaching mode with that under the AI teaching mode. The test results are shown in Table 1 and figure 1.

Table 1. Comparison of entrepreneurial teaching effects under different modes

	Improve interest in learning	Improve practical ability	Insist on learning knowledge	Entrepreneurial success	Entrepreneurial failure
AI teaching	78%	82%	66%	58%	34%
Traditional teaching	66%	71%	45%	46%	59%

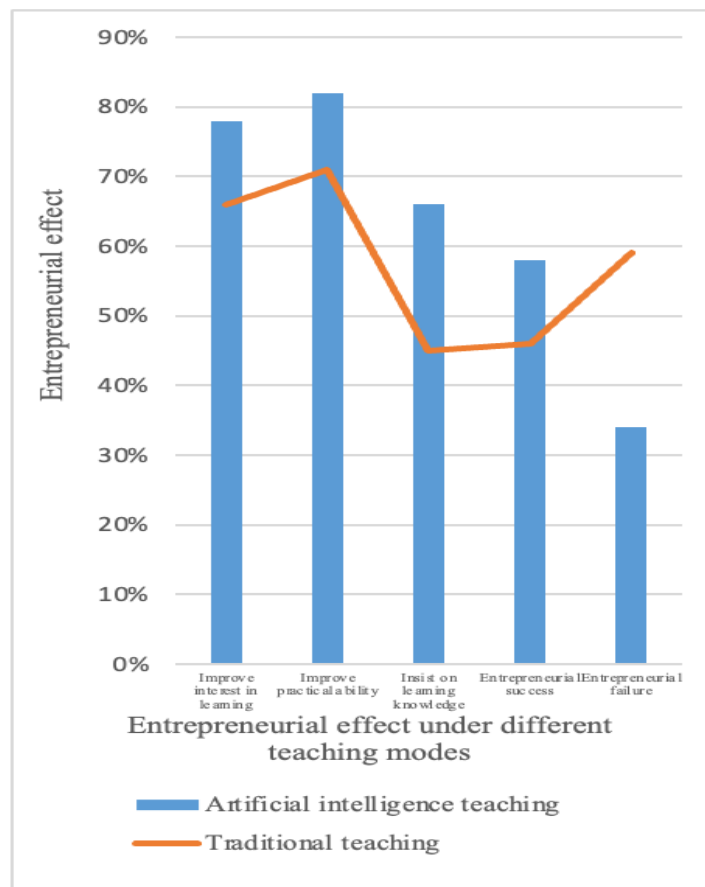


Figure 1. Entrepreneurial effect under different teaching modes

As can be seen from the above chart, 78% of the students of IAEE said that they could improve their interest in learning under the AI education mode, and 82% of the students said that they would help improve their practical ability, and the success rate of entrepreneurship

reached 58%; In comparison, under the traditional mode, the success rate of entrepreneurship is only 46%, and improving learning interest and practical ability account for 66% and 71% respectively. On the whole, AI teaching provides a more favorable condition for IAEE.

Next, investigate the reaction speed and accuracy of AI in image recognition, semantic recognition and speech recognition under the AI teaching mode. The test results are shown in Figure 2.

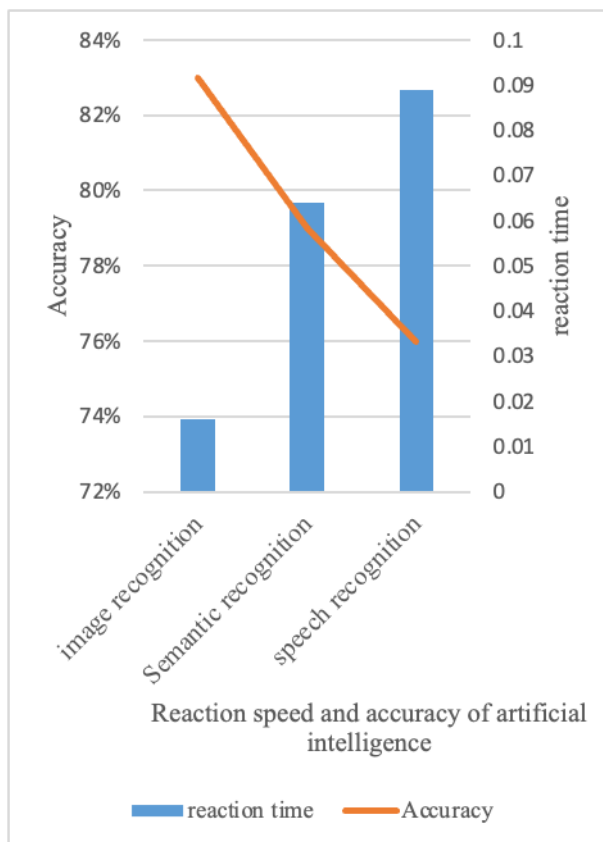


Figure 2. Reaction speed and accuracy of AI

The results show that AI responds very fast in image recognition, semantic recognition and speech recognition, and the accuracy rate is more than 75%. Based on the above experiments, it is fully proved that the IAEE driven by AI is feasible and effective.

5 CONCLUSIONS

At present, the application of AI in teaching is still in the initial stage, but it has shown great potential. The further development of intelligent teaching in the future needs the guidance of human wisdom. Focusing on the IAEE driven by AI, this paper discusses and analyzes the application of AI in IAEE; Through comparative experiments, it is fully proved that the IAEE driven by AI is feasible and effective. In order to strengthen the practical application of artificial intelligence in teaching and realize the deep integration of artificial intelligence and education, it is necessary to further strengthen the practical application of artificial intelligence in entrepreneurship teaching.

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