



Training of Skilled Talents Based on Artificial Intelligence

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Abstract. With the deepening of education reform, artificial intelligence technology can gradually adapt to the future information age. At the same time, it also points out the direction for the development of artificial intelligence education, and injects a strong impetus into the current artificial intelligence education in terms of curriculum content, system structure, training mode and educational objectives. This paper combines intelligent learning mode with vocational and technical courses. It enables learners to experience and use artificial intelligence technology for practical creation, promotes learners' in-depth learning, and comprehensively improves learners' core literacy and knowledge mastery. The teaching model of vocational and technical courses based on intelligent learning constructed in this study can provide feasible operation procedures and teaching ideas for trainers who have not yet offered artificial intelligence courses, and can also provide reference for schools that have used new textbooks but still have problems. To a certain extent, it enriches and improves the theoretical basis of vocational and technical curriculum research. Based on the contents and objectives of vocational and technical courses, this study also constructs a teaching mode suitable for the development of vocational and technical courses, which has reference value for the teaching research and implementation of vocational and technical courses in China.

Keywords: Vocational and technical education · Artificial intelligence · Teaching model · Training model

1 Introduction

Artificial Intelligence (AI) mainly studies how to use artificial methods and technologies to make all kinds of automatic machines or intelligent machines (mainly referring to computers) to imitate, extend and expand human intelligence to achieve certain Automation of the machine thinking or mental work. After the deep combination of artificial intelligence and education, it will become the main force of classroom teaching, and it will also bring unprecedented challenges to education. At present, artificial intelligence is promoting the rapid development of education and teaching with the orientation of fairness, high efficiency and individualization. The traditional teaching mode attaches

great importance to the design of class hours, which can easily lead to the fragmentation of knowledge, resulting in learners' lack of overall grasp of knowledge. In the new curriculum standard of information technology in vocational and technical education, it is pointed out that learners should learn in practice. At the same time, through intelligent learning, learners can internalize and construct knowledge, reflect on the learning process, cultivate skills, and develop a variety of thinking in the problem situations created by trainers and the tasks they complete [1]. The intelligent teaching mode emphasizes creating problem situations that are close to real life for classroom teaching. Trainers prepare and provide learners with a variety of rich learning resources, learning methods and tools in advance, and guide learners to explore and solve various complex and real problems independently or cooperatively, and gradually master the scientific knowledge hidden behind the problem, train and cultivate learners' problem-solving ability and self-learning ability [2]. Many research results in the field of artificial intelligence are based on the mode of discovering problems, analyzing problems, solving problems and drawing conclusions, which coincides with the basic process of intelligent learning mode [3]. Therefore, combined with the new requirements of information technology disciplines for talent training goals, exploring how to use new teaching materials to effectively carry out artificial intelligence courses based on intelligent learning has certain research value to promote the development of artificial intelligence teaching and research in my country to the greatest extent.

Artificial intelligence can address all kinds of problems in educational inequities. Artificial intelligence will not be restricted by regions. It can integrate high-quality teaching resources and share them on online teaching platforms. Besides, it can also increase the supply of high-quality education resources and allow more children to enjoy the services of "famous teachers" from all over the world. It even combines high-quality global teaching resources to actively generate targeted teaching content. Artificial intelligence is not only a massive mobile knowledge repository, but also has the ability to collect and sort out problems, integrate resources, and constantly upgrade the learning system. It can actively set up related knowledge base in response to students' questions in class to solve the problem of knowledge reserve. Therefore, in the future, education will not be troubled by regional differences, teaching forms, age differences, educational background and other problems, and education fairness will be truly realized.

In terms of subject teaching application, British scholars Pinho-Lopes and Macedo adopted an intelligent learning mode for two classes of learners participating in a geotechnical engineering courses in Aveiro University, Portugal. The results indicate that learners have a high evaluation of intelligent learning mode, which can effectively improve learners' learning efficiency [4]. Australian scholars adopt intelligent learning to cultivate the creativity and imagination of learners in the preparatory stage, and the results illustrate that learners show different exploration spirit, adventure spirit and creativity in the course [5]. In terms of the effectiveness of intelligent learning, American scholar Miri Barak and others studied the cultivation of innovative thinking of different learners by intelligent learning, and adopted the same PBL course for two groups of learners. The results showed that PBL had different degrees of positive impact on the perception and innovative thinking of two groups of learners [6]. To study how to make learners better integrate the knowledge of different disciplines, Muhammad et al., a Malaysian

scholar, adopted intelligent learning for learners majoring in chemical engineering at the University of Petroleum Technology in Malaysia. The results indicate that this mode can promote learners' understanding of basic knowledge [7], and can also cultivate learners' leadership, communication and time management skills.

In view of the application potential and value of artificial intelligence to society, it has triggered educational thinking in the future personnel training. The awareness and skills of artificial intelligence needed by future citizens have become the objective needs of education. Artificial intelligence education, as an effective way to cultivate the literacy needed to adapt to the future intelligent society, is of great significance to help students form intelligent social consciousness and adapt to the development of intelligent society. This paper analyzes the basic elements and processes of the educational objectives and contents of the artificial intelligence course under the vocational skills information technology curriculum standard, and combines the actual situation of teaching to construct the teaching mode based on the artificial intelligence course, and carries out the teaching design based on information technology teaching materials. Through comparative experiments, it is proved that the teaching mode can effectively improve learners' cognition of artificial intelligence and cultivate learners' comprehensive quality. It provides new teaching ideas for trainers to carry out artificial intelligence courses.

2 Construction of Skill Training Model

Based on the influencing factors and research hypotheses of ternary interactive determinism, this study intends to construct a preliminary theoretical model of the influencing factors hypothesis, as shown in Fig. 1.

Individual factors mainly refer to learners' interest in learning the course, self-efficacy and intellectual literacy. Environmental factors mainly refer to the individual's perception of trainer support and resource platform in specific activities. Dependent variables mainly refer to the degree of learning participation.

Learning interest, intellectual literacy, self-efficacy and resource platform have a significant positive and direct impact on learning participation. So in the model, the arrow is directed to the learning participation.

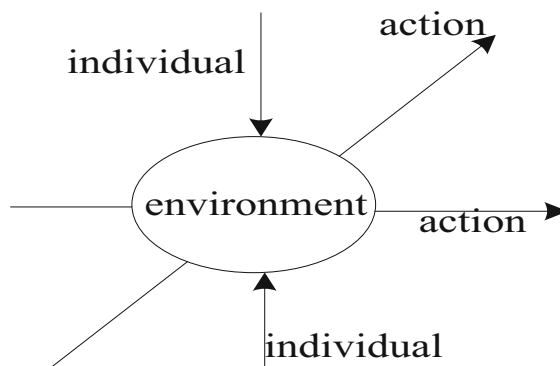


Fig. 1. Three-element interaction behavior model

Trainer support has an indirect positive impact on learning engagement. By providing various support for learners, trainers can make them have a positive interest in learning, thereby changing their learning behavior, and ultimately promoting learners' learning engagement [8]. In addition, some studies have shown that trainer support can predict learning participation through learners' self-efficacy, and self-efficacy has a mediating effect. Therefore, this study points the arrows of trainer support to learning interest and self-efficacy respectively.

The learning of artificial intelligence modules can be regarded as the cooperative learning between human and robot. Therefore, this study holds that learners' intelligence literacy is likely to affect learners' use and attitude toward learning tools and platforms, so the intelligence literacy arrow in the model points to the resource platform.

3 Intelligent Training Model Analysis Process

The intelligent training model analysis process is displayed in Fig. 2.

(1) Construct the hierarchical structure chart of skill training, in which the model is composed of three parts: the target layer, which is the final goal, the criterion layer, which is the factors affecting the development of things, and the index layer, that is, the specific sub-factors affecting the development of things, as shown in Fig. 3.

(2) Construct the judgment matrix

The scale method was adopted to score the intensity of the indicators in the questionnaire. Firstly, experts compare the indicators determined by the questionnaire in

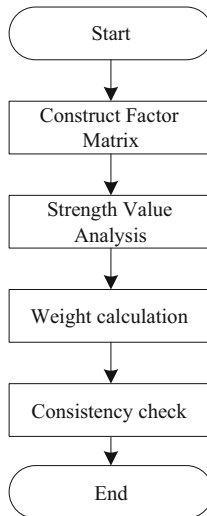


Fig. 2. Model analysis process

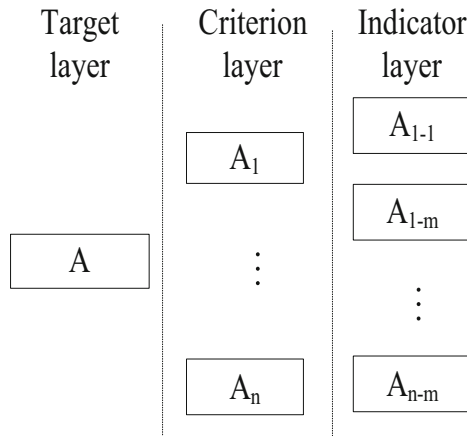


Fig. 3. Hierarchical structure of skill training analysis

pairs, then assign the strength, and finally establish the judgment matrix through expert assignment [9].

$$\begin{cases} B_1 & B_1 & \dots & B_n \\ B_{11} & B_{12} & \dots & B_{1n} \\ \vdots & \vdots & \dots & \vdots \\ X_n & X_{n1} & \dots & X_{nm} \end{cases}$$

(3) Determine the strength value of each factor

Experts are invited to score the strength of each sub-factor, and the average value of the expert scores is calculated by SPSS software to finally determine the strength value of the sub-factor.

(4) Random consistency (CR) test

$$CR = CI/RI \leq 0.01 \tag{1}$$

$$CI = \frac{\alpha_{\max} - n}{n - 1} \tag{2}$$

Where, CR is the consistency index, CI is the matrix deviation index, and α is the index coefficient.

(5) Indicator analysis

The results based on the mean stochastic-index test are shown in Table 1.

The intra-group pairwise comparison matrix hierarchical single ranking and hierarchical total ranking rank the factors and sub-factors affecting development according to the weight, and then establish a parallelogram to determine the type of skill training development strategy [10].

Table 1. Index Reference

Indicators	B_1	B_2	B_3	B_4	B_5
Parameters	0	0.35	0.57	0.79	1.11

4 Experimental Analysis

4.1 Experimental Data

The subjects of the study were vocational skill schools, and the samples were randomly selected. A total of 600 questionnaires on learning participation and influencing factors were issued, 517 questionnaires were recovered, and 504 valid questionnaires on learning participation were finally obtained.

4.2 Analysis of Experimental Results

(1) Intelligent reliability test

The data reliability quality of learners’ design learning style through questionnaire survey is shown in Table 2.

Usually the Cronbach α coefficient has a value between 0 and 1. If the α coefficient does not exceed 0.6, it is generally considered that the internal consistency reliability is insufficient; when it reaches 0.7–0.8, it indicates that the scale has considerable reliability, and when it reaches 0.8–0.9, it indicates that the scale has very good reliability. It can be seen from Table 2 that in the following dimensions: learning interest, self-efficacy, intellectual literacy, teacher support, and resource platform, the Cronbach α coefficients are all above 0.8, which fully indicates that the reliability of the scale is very good.

(2) Experimental control group test analysis

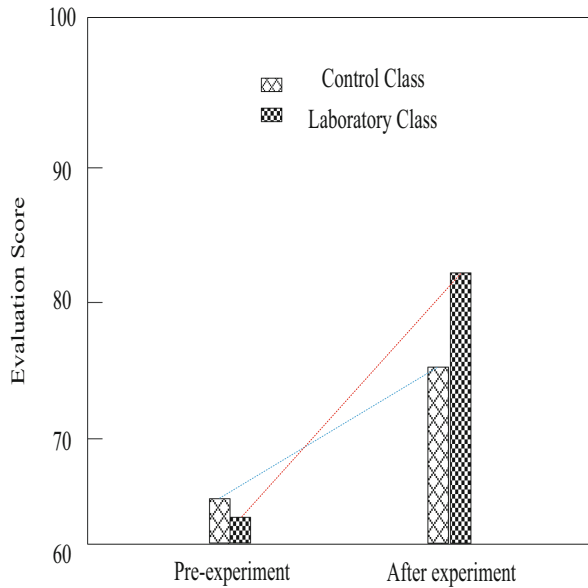
To test whether project-based learning can improve learners’ knowledge mastery, the learners were tested on the basic knowledge of artificial intelligence after the teaching experiment, which is to collect real and effective data [11]. The subjects are the

Table 2. Cronbach reliability analysis of influencing factors of learning engagement

Dimension	Number of terms	Sample size	Cronbach α
Learning interest	4	504	0.824
Sense of self efficacy	5	504	0.836
Smart literacy	4	504	0.839
Trainer support	5	504	0.818
Resource platform	2	504	0.851
Total reliability	20	504	0.846

Table 3. Statistical table of learners' achievement

	Experimental class	Control class	T
Before the experiment	62.87	63.46	0.59
After the experiment	82.44	75.49	6.95

**Fig. 4.** Analysis of test data

experimental class and the control class, and the results of the data analysis of the test questions are indicated in Table 3 and Fig. 4.

In the case of no significant difference in the pretest scores between the two classes, after a month and a half of a teaching experiment, it is found that the average scores of the experimental class and the control class are different. The experimental class is 6.95 points higher than the control class. The independent sample T test showed that the experimental class reached a significant level of improvement. It shows that the course teaching mode based on artificial intelligence learning can really improve learners' knowledge mastery, which may be related to the fact that project-based learning can mobilize learners' learning initiative and enthusiasm.

5 Conclusion

In this paper, based on the existing artificial intelligence courses and project-based learning research, the teaching mode of vocational and technical courses based on intelligent learning is constructed. A teaching case is designed based on the latest information

technology textbook published by Guangdong Education Press, and applied to teaching practice to verify the effectiveness and feasibility of the mode.

In the future work, we will refine the analysis of the influencing factors of each dimension of participation, and explore the specific influence and internal relationship of each factor on learning participation through the analysis of the influencing factor model. The future study will investigate the level of learning participation and influencing factors in the artificial intelligence module. It will also provide some experience reference for the subsequent in-depth study of other modules, put forward how to let students learn artificial intelligence knowledge in the classroom, and explore the participation and influencing factors.

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