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Feasibility Study of Output-oriented Method in Ideological and Political Theory Course Teaching under the Background of Artificial Intelligence

Huijuan Zhang[1,*]

[1] Marxist College, Fujian Preschool Teachers College, Fuzhou 350001, Fujian, China

Abstract: *With the widespread popularity of artificial intelligence, many unrelated knowledge are gradually linked together. The output-oriented method used in this study was used in foreign language teaching when it was proposed. In the context of artificial intelligence, this research applies the output-oriented method to ideological and political teaching, and the core of the research is to prove the feasibility of the output-oriented method in ideological and political teaching. Before the start of the research, we investigate and analyze the research results of some scholars related to this research, find out the deficiencies of these research results, and find some content suitable for this research. Corresponding innovations are made on its basis to obtain the results of this study. In the process of research, this paper gives a detailed description of artificial intelligence, output-oriented method, ideological and political teaching, and feasibility analysis, and focuses on the introduction of artificial intelligence neural network algorithms. Finally, the feasibility of the output-oriented method in ideological and political teaching is proved through the actual application of the output-oriented method. The experimental data shows the high, medium and low of the experimental group. The average scores of the pre-test were 63.79, 53.69 and 40.83 respectively, and the average scores of the post-test were 70.82, 60.85 and 52.17 respectively.*

Keywords: *Artificial Intelligence, Output-oriented Method, Ideological and Political Teaching, Feasibility Study*

1 Introduction

As a compulsory course for freshmen, the ideological and political course has its own profound doctrinal connotation. Many educational and life philosophies contained in the curriculum are closely related to the life of middle school students. However, if the incorrect guidance (For example, because the texts in textbooks are all highly generalized and refined languages, knowledge and principles are relatively obscure and abstract. For students with relatively weak comprehension, learning and receptive abilities, if teachers choose biased teaching methods, it is difficult for teachers to accurately express the teaching content) due to the interference of various factors such as teaching requirements, teaching method selection, audience ability, concept and understanding, etc., causes students' inner rejection of ideological and political courses, it will become an inevitable result. The educational demands expected by the curriculum are naturally difficult to achieve. Among all the influencing factors listed, it has been clearly shown through research and practical teaching that a lively and interesting, interactive communication, and closely related to real-life teaching expression is one of the most acceptable and effective ways for students to accept. Practice has proved

*zhj2010@fjys.edu.cn
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that under the traditional teaching mode in which teachers are the main body to control the entire classroom, it is undeniable that students can achieve certain expected results when they learn knowledge goals. However, the traditional teaching mode exists in the "educational shortcomings" in cultivating students' individual practical operation ability, innovation consciousness, independent thinking, cooperation consciousness and other abilities. In real social life, its "religious malpractice" is gradually emerging.

This research helps to construct a classroom model for students to acquire knowledge in all directions. When evaluating the effect of education, "high scores and low energy" is a topic that is often talked about. Under the background of long-term examination-oriented education, students have basically deprived the possibility of acquiring practical ability through school education. The traditional classroom teaching mode often suppresses students' interest and desire to acquire knowledge due to boring lectures.

The innovation of this paper is that:

It expounds the specific principles that should be grasped in the actual application process of the "output-oriented method", as well as the laws and methods that should be followed in the process of organization and implementation. It is the modernization and improvement of the "output-oriented method". It is not only the process of digging and refining the teaching materials, but also the new era connotation of education and teaching reform given by the new curriculum standard.

The research sampled the teaching content of some high school ideological and political courses. By intervening in cases in the classroom space, this paper takes the creation of situations and pre-set questions as methods and means to guide students through case study and discussion, and stimulate their learning initiative as kinetic energy. It achieves the purpose of cultivating multi-level thinking ability such as economy, culture and philosophy brought about by internalization cases.

From the final goal of the research, this paper contributes to the fundamental change of the concept of talent education and training. The "output-oriented approach" takes constructivism as a platform and gradually builds a bridge between theory and practice. Through teachers and students' analysis, discussion, evaluation, and commentary of cases at different levels in different teaching environments, it is conducive to the construction of students' independent exploration of existing knowledge, and is conducive to improving the real situation of teachers' "one word teaching". To a certain extent, it is an efficient booster to realize the transformation of traditional educational concepts to new educational concepts.

2 Related Work

Many scholars at home and abroad have conducted in-depth research on artificial intelligence, output-oriented methods, ideological and political teaching, and feasibility, and have provided a wealth of references. Joe H proposed a new low-power mode - o-sleep. This mode can switch the output device to a low-power state when the smartphone prepares results for the user. In multiple test scenarios, this mode allows the smartphone to be in o-sleep state for up to 58% of the total usage time, effectively reducing energy consumption [1]. Canals V proposed a new approach to hardware implementation of neural networks based on probability laws. He constructed the basic modules required for neural networks through various designs. This method has low hardware cost and can implement complex mathematical functions such as hyperbolic tangent, so it can be used to build high-reliability systems and parallel computing architectures [2]. Qian Y J studied the engineering design method of linear sound absorbers for specific high sound pressure level (SPL) environment applications. The specific design process of linear micro-perforated plate sound absorbers was

elaborated in detail, and a practical design case was given based on the current method. Finally, the reliability of the design results was verified through experiments. This study provides new ideas and new approaches for the effective application of micro-perforated plate sound absorption materials in high sound pressure environments [3]. Zhang Y proposed a novel two-layer collaborative planning method for optimizing the layout of distributed generation (DG) and battery energy storage (BES) units at the inverter interface to enhance the voltage regulation capability in the active distribution network (ADN) [4]. Shen C proposed a correction strategy oriented towards improving efficiency based on the analysis of the operating mode. By optimizing the inductance ratio, characteristic impedance and transformer turns ratio of the converter, bilateral soft switching operation in the high output voltage region was achieved, and the conduction loss was significantly reduced by optimizing the resonant parameters [5]. Zeng Z studied the interaction mechanism between citation indicators and author-related indicators, and defined new concepts of output factor and input factor. By combining the output and input factors through a comprehensive weighting method, a two-dimensional journal classification framework was constructed, and a sorting method based on Pareto non-dominated sets was proposed. To verify the effectiveness and practicality of this method, he collected relevant data from 84 major journals in the category of "Operations Research and Management Science" for case analysis. The new insights obtained will help guide the formulation of future journal classification standards [6]. Lee K is committed to using spectral methods to approximate solutions in selected finite-dimensional subspaces, and proposed a new type of stochastic least squares Petrov-Galerkin (LSPG) method, while establishing the optimality and error bound of this method. A large number of numerical experiments show that the weighted LSPG method is superior to other spectral methods in minimizing the objective weighted norm [7].

The above research still has problems such as insufficient data and the conclusions need further verification. Therefore, it has not been widely recognized and is difficult to be promoted and applied in practice.

3 Artificial Intelligence and Output-oriented Methods and Ideological and Political Teaching

3.1 Artificial Intelligence

Some people believe that machines that look similar to humans and can perform specified tasks automatically are called artificial intelligence [8, 9]. Others consider AI to be computer programs that think in a similar way to humans [10, 11]. This definition sees that the simulated object of AI is human intelligence, but the definition is also somewhat inadequate [12]. There is also a view that a computer program that behaves similarly to humans can be called an AI technology [13, 14]. All of the above perceptions are superficial and superficial understanding of AI, and none of them can define AI well [15]. In general, the above views are one-sided and do not achieve an in-depth understanding of AI technology [16].

The artificial intelligence industry mainly presents the following characteristics:

First, as a technology-intensive field, the industry is highly dependent on high-end talents and the labor cost remains high [17, 18]. Artificial intelligence is based on deep learning algorithms and large-scale data collection, and urgently needs a large number of talents with high-level professional and technical capabilities. The vigorous development of the artificial intelligence field in recent years has exacerbated the contradiction between supply and demand of professional talents and further increased the cost of talent introduction. At present,

the industry still faces a significant talent supply gap [19]. Second, artificial intelligence has not completely subverted traditional industries, but has systematically evolved and expanded their functions [20, 21]. Artificial intelligence technology is widely used in traditional industries, empowering traditional production models through advanced technology, promoting the upgrading of their products and services, and thus promoting the coordinated development and commercial application of traditional industries [22]. Third, the various sub-sectors of artificial intelligence are showing a highly specialized development trend, but there are differences in the degree of technical correlation between different fields [23, 24]. The current artificial intelligence industry has a wide layout, and back-end technology research is becoming more specialized, but the development of each field still has limitations. Different AI technologies have yet to fully converge, and the synergy and coupling between them still need to be improved. Figure 1 shows the current state of AI-related research and applications.

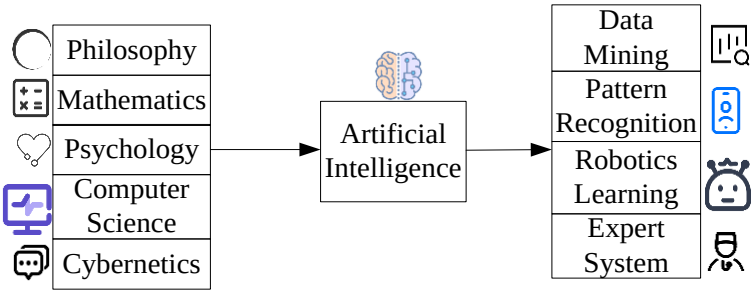


Figure 1: Research and application of artificial intelligence

Applications of artificial intelligence include:

4 Expert system

Expert systems emphasize knowledge rather than methods. When designing, knowledge and other parts should be separated from the system, and the knowledge base and reasoning engine should be used as the core according to knowledge representation and knowledge reasoning technology.

5 Intelligent robot

In a broad sense, an intelligent robot refers to a human-like or other form of artificial machine with certain human abilities. Although the level of intelligence of robots currently developed is still not very high, it is still far from the real intelligence of life. On the basis of the existing technology, people customize all kinds of robots according to the actual needs of all walks of life. It is used for detection, disaster relief, handling, express delivery, cleaning, etc. These robots can replace humans in high-risk, monotonous tasks. It liberates human beings to a large extent, prompts human beings to turn to more creative work, and improves social productivity. An example diagram of artificial intelligence is shown in Figure 2.

Figure 2: Examples of artificial intelligence

The impact of the development of artificial intelligence industry:

Artificial intelligence will develop civilians and facilitate human life. Artificial intelligence will solve people's necessities of life, and intelligent cities will become the direction of urban development in the future. Artificial intelligence will solve problems such as traffic congestion and travel with simpler and more convenient operations, and intelligence will be seen everywhere in life.

Artificial intelligence will change the traditional economic structure. The new retail industry will use artificial intelligence as the technical cornerstone, through big data analysis, to quickly and accurately find consumer preferences and provide consumers with the most satisfactory services.

With the emergence and popularization of artificial intelligence robots and artificial super brains, China's current laws will not be able to apply to intelligent products. Because their development may exceed the scope expected by human beings at this stage. Subsequently, the human legal system will also be transformed into another form and exist.

BP neural network has the following characteristics:

The middle layer is composed of multiple layers, all layers are connected, and neurons in the same layer are not connected. Setting up multi-layer neurons can dig out more hidden information.

The transfer function of BP neural network must be differentiable. Sigmoid functions are often used as transfer functions. Depending on the specific function, the sigmoid function is usually used in a modified form.

The learning process adopts the error back propagation algorithm.

The input layer of a radial basis neural network receives signals from the outside world and propagates them between layers, which in turn are passed into the hidden layer whose neurons, unlike other layers, are themselves defined by radial basis functions.The other layer is the output layer. In order to achieve the same purpose, the radial basis method requires a lot more neurons than other methods, so it can be seen that the standard forward network cannot be replaced by the radial basis network. At the same time, the number of neurons in the radial basis neural network determines the length of the training time and the accuracy of the network. For any continuous function, the more neurons in the radial basis network, the higher the accuracy of its approximation. Figure 3 is a model of a radial basis neuron.

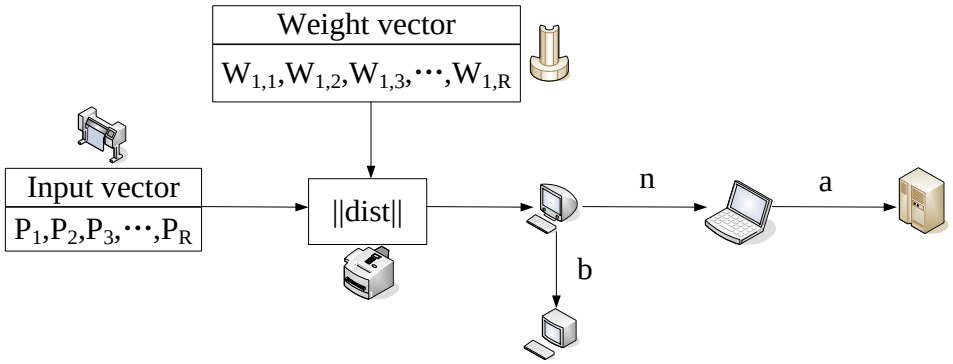


Figure 3: Radial base neuron model

The theoretical basis of radial basis network is the multivariate difference problem in high-dimensional space. It successfully solves some problems existing in the BP algorithm, such as the slow convergence speed of BP and the difficulty in finding the global optimal value. The structure of the hidden layer of the radial basis network is also different, especially the choice of its basis function is different from other algorithms, and the Gaussian function is often used as:

$$\omega_\nu(\gamma-\rho_\nu)=\exp(-\|\gamma-\rho_\nu\|^2/2\lambda_\nu^2),\nu=1,2,...,\kappa \tag{1}$$

The functional expressions of the input layer and output layer of the radial basis network are:

$$\chi_\mu=\sum_{\nu=1}^{\kappa}\varpi_{\nu\mu}\exp(-\|\gamma-\rho_\nu\|^2/2\lambda_\nu^2),\nu=1,2,...,\varphi \tag{2}$$

where ρ_ν is the data center of the basis function, λ_ν is the variance, and $\varpi_{\nu\mu}$ is the weight of the implied layer to the output layer.

Gradient training method, the gradient training method has many methods for modifying the hidden layer nodes, expansion constants, and the weights of the output layer, and most of them use the method of minimizing the objective function. This method is very similar to the training algorithm of BP network, but this paper presents a new gradient training method, which adds a forgetting factor and is a single-output algorithm. The objective function of this network learning is:

$$K=\frac{1}{2}\sum_{\mu=1}^{t}\alpha_\mu k_\mu^2 \tag{3}$$

where α_μ is the increasing forgetting factor.

Set k_μ as the error signal:

$$k_\mu=\chi_\mu-f(\gamma_\mu)=\chi_\mu-\sum_{\nu=1}^{h}\varpi_\mu\phi_\nu(\gamma_\mu) \tag{4}$$

The gradient of the radial basis network function $f(\gamma)$ to the sample data center a_ν, the expansion constant s_ν, and the output weight ϖ_ν are:

$$\nabla_{a_\nu} f(\gamma) = \frac{2\varpi_\nu}{s_\nu^2}\phi_\nu(\gamma)(\gamma - a_\nu) \tag{5}$$

$$\nabla_{s_\nu} f(\gamma) = \frac{2\varpi_\nu}{s_\nu^3}\phi_\nu(\gamma) \| \gamma - a_\nu \|^2 \tag{6}$$

$$\nabla_{\varpi_\nu} f(\gamma) = \phi_\nu(\gamma) \tag{7}$$

The adjustment amounts of a_ν , s_ν and ϖ_ν, are:

$$\Delta_{a_\nu} = \beta \frac{2\varpi_\nu}{s_\nu^2}\sum_\mu^T \alpha_\mu k_\mu \phi_\nu(\gamma_\mu)(\gamma_\mu - a_\nu) \tag{8}$$

$$\Delta_{s_\nu} = \beta \frac{2\varpi_\nu}{s_\nu^3}\sum_\mu^T \alpha_\mu k_\mu \phi_\nu(\gamma_\mu) \| \gamma_\mu - a_\nu \|^2 \tag{9}$$

$$\Delta_{\varpi_\nu} = \beta \sum_\mu^T \alpha_\mu k_\mu \phi_\nu(\gamma_\mu) \tag{10}$$

In the Formula: β represents the learning rate; $\phi_\nu(\gamma_\mu)$ represents the output value of the corresponding ν hidden layer node.

The feedforward type can deal with nonlinear problems, which is mainly due to the introduction of the special structure of the hidden layer and the use of nonlinear transfer functions. Their output values are determined by the input and connection weights of the network, and the actual system is dynamic, so the feedforward network has shortcomings in practical applications. The feedback-type neural network has dynamic characteristics, and there is a feedback memory link in the structure of the network, which has a good effect on processing dynamic samples with multiple inputs/multiple outputs. There are many types of feedback networks, mainly including continuous Hopfield network, Elman neural network and so on.

The Elman neural network consists of two main parts: one is the feedforward connection; the other is the feedback connection. The feedforward connection has the same structure as the BP neural network, which is mainly composed of three parts: the input layer, the hidden layer and the output layer, and the connection weights are continuously revised through learning. The feedback connection part has a memory function, which can record the output value of the neural network at the previous moment. It is mainly composed of a group of special structural units, and in the process of learning, the weights of this part remain unchanged. There is a special hidden layer in the Elman neural network, which is very different from the ordinary hidden layer, which is generally called the association layer. The association layer is a structure specific to this network. Its main function is to combine the training data sample information at the current moment with the state of the hidden layer before that moment. Using the storage function of the feedback connection, it propagates the combination of the two to the hidden layer together, and the state of the feedback has a direct impact on the output of the network. The Elman neural network model is shown in Figure 4.

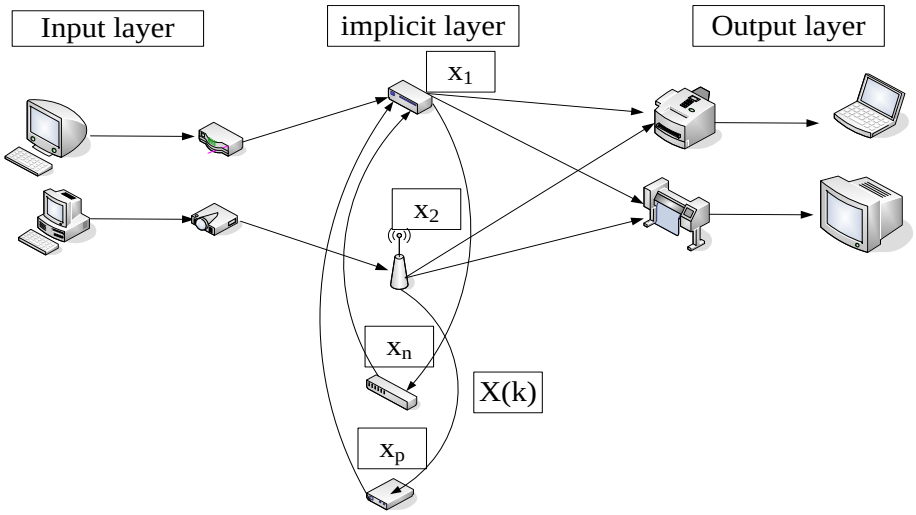


Figure 4: Elman neural network model

Assume the error of the network weight adjustment at a certain n time of the function K:

$$K(n)=\frac{1}{2}\sum_{m=1}^{s}(\tau_m(n)-y_m(n))^2 \tag{11}$$

The Formula: $\tau_m(n)$ represents the expected output value of the mth output node at time n.

Assuming El(t) is the output error at time n, the expression can be expressed as:

$$K_m(n)=\tau_m(n)-\chi_m(n) \tag{12}$$

Variation of network weights:

$$W(n+1)=W(n)+\beta(-\frac{\partial K(n)}{\partial(W)})+\delta\Delta W(n) \tag{13}$$

W in the Formula represents the weight of each layer of the network.
The weights of the output layer are processed using the following Formula:

$$-\frac{\partial K(g)}{\partial \varpi_{\mu\nu}^{1}}=-\frac{\partial K(g)}{\partial \gamma_\mu(g)}*\frac{\partial \gamma_\mu(g)}{\partial \varpi_{\mu\nu}^{1}} \tag{14}$$

In the same way, the weights of the hidden layer can be obtained:

$$-\frac{\partial K(g)}{\partial \varpi_{\mu\nu}^{0}}=-\sum_{m=1}^{s}\frac{\partial K(g)}{\partial \gamma_m(g)}*\frac{\partial \gamma_m(g)}{\partial \varpi_{\mu\nu}^{0}} \tag{15}$$

Polynomials and functions:

$$P(\gamma,y_\mu)=[(\gamma,y_\mu)+1]^{\tau} \tag{16}$$

The derived τ-order polynomial classifier:

$$F(\gamma,\sigma)=sign(\sum_{\sup\ port\ vetor}x_{\mu}\sigma_{\mu}(y_{\mu}*\gamma+1)^{\tau}-c) \tag{17}$$

The decision rule of this method in the radial basis generally uses a Gaussian function:

$$F(y)=sign(\sum_{\mu=1}^{m}\sigma_{\mu}E_{\chi}(|\gamma-y_{\mu}|-c) \tag{18}$$

$$E_{\chi}(|\gamma-y_{\mu}|)=\exp(-\frac{|\gamma-y_{\mu}|^{2}}{\sigma^{2}}) \tag{19}$$

Multilayer Perceptron:

$$E(y_{\mu},y_{\nu})=\tanh(\chi y_{y}^{N}y_{\nu}-\Theta) \tag{20}$$

The biggest difference between Elman neural network and other neural networks is that the network has a succession layer, the main function of which is delay and storage, and this layer can combine the input and output of the hidden layer. It is precisely because of this very special network structure that when historical memory data information appears, it can quickly capture the information and respond accordingly. The general feedforward network belongs to the static network and cannot handle dynamic problems. When they introduce internal feedback structural units, they can deal with dynamic problems, thus realizing the idea of dynamic modeling.

5.1 Output-oriented Approach

The theoretical system of the Output Oriented Approach (POA) is shown in Figure 5.

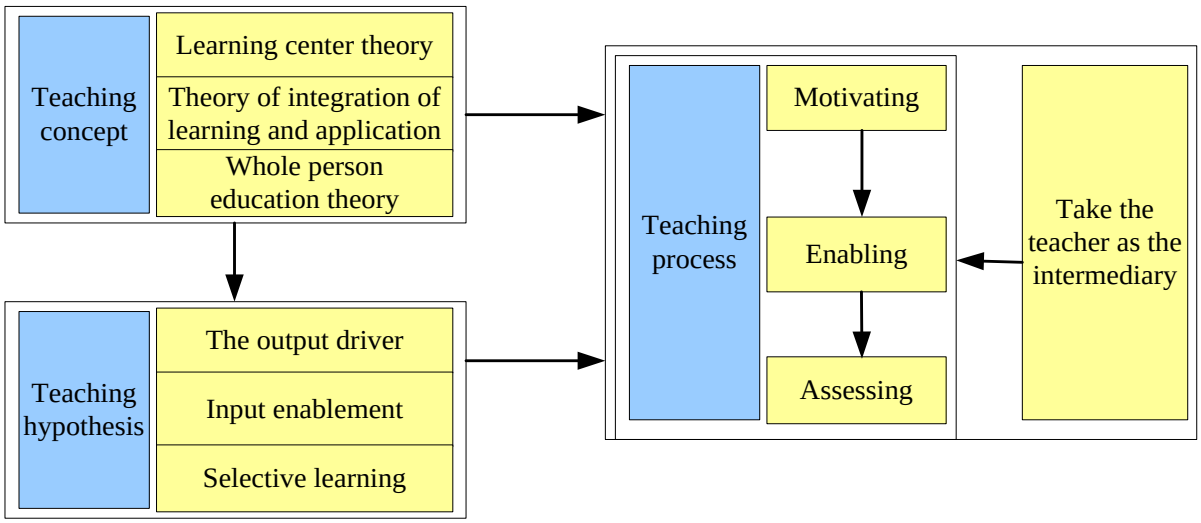


Figure 5: the theoretical system of POA

The applied research methods of "output-oriented method" are as follows:

Observation method by going deep into high school ideological and political classrooms, listening to and observing the teaching activities of different teachers, and combining with the practical teaching activities of their own off-campus practice bases. According to the sampling needs of the research materials, during the traineeship and internship, carefully observe the content of the same or different textbooks by different teachers, and learn how to choose

teaching methods and teaching methods. Focus on observing the application of the "output-oriented method" during the course. Collect student feedback on the effectiveness of the pedagogical application. Objectively examine the key links in the implementation process of output orientation and the core issues that teachers and students are concerned about.

Experience summarizing method by summarizing the successful open classes of off-campus experts and teachers in the subject, and under the personal guidance of experts from off-campus education bases, boldly apply the "output-oriented method" to practical teaching activities. Summarize successful experience in practical application, and timely discover improper operation links that need to be improved and perfected. Repeatedly consider the educational effects of this teaching method and traditional teaching methods to find and innovate the best output-oriented plan for high school ideological and political courses.

The development process of teaching hypothesis in POA theory is shown in Figure 6.

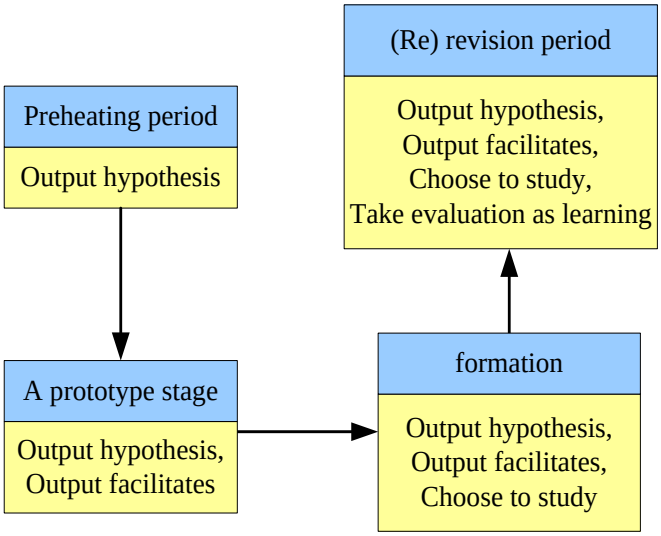


Figure 6: Development of teaching hypothesis in POA theory

The development process of POA theoretical system is shown in Table 1.

Table 1: Development history of POA theory system

The name of the stage	Time period	Theoretical development trajectory
Preheating period	2007-2013	Propose "output driven hypothesis"
A prototype stage	2013-2014	Propose "output driven - Input driven hypothesis"
formation	2015-2016	The theoretical system of POA was first constructed
Revision period	2016-2017	Revise POA theory system
Revision period again	2017-2018	Revise the POA theory system again

5.2 Ideological and Political Teaching

As an ideology-shaping humanities subject, thought and science class expresses the fruits of human ideology throughout history and is further refined and upgraded with the development of the times. In the process of teaching ideological and political classes in ancient and modern times, the most effective delivery is based on the immediate social times and problems, and teaching students to think about ways and means of solving these problems. The purpose that socialist ideological and political theory courses are intended to achieve is to bring mankind together in solidarity to share the fruits of productivity development and to move into the

future together. Therefore, in the case of socialist ideological and political theory classes, which aim to shape the spiritual body of an excellent personality, cooperative teaching is both necessary and necessary for the cultivation of socialist ideology. Therefore, when conducting ideological and political education in schools, it is necessary to improve not only the teaching content but also the teaching methods, and to regard them as an important part of students' social practice in order to better internalize the spirit and essence of socialism as well as the socialist worldview, outlook on life and values into students' self-awareness, to promote their all-round development, and to put the purpose of socialist ideological and political teaching into practice.

Problems existing in the traditional cooperative learning model teaching:

6 The classroom design is unreasonable, the regulation and guidance are not in place, and the classroom efficiency is low

Teachers repeat teaching mechanically, ignore effective motivational teaching, cannot deeply understand the essence of motivational teaching theory, and cannot scientifically use motivational education methodology to carry out teaching. To a large extent, this teaching mode limits students' vision and dampens their interest in learning. Not to mention the exercise and cultivation of students' independent thinking ability, and the transformation of knowledge into wisdom is not even thought of.

At present, in the teaching of ideological and political courses in middle schools, there are many unreasonable classroom design. Teachers still follow the traditional "cramming" teaching mode in classroom design. Some teachers even use the classroom teaching design from many years ago. As a result, the regulation and guidance in the teaching process is not in place, and the efficiency of classroom teaching is low.

7 The evaluation is not timely and incomplete, and there is a lack of guidance

In terms of assessment mechanism, ideological and political teaching still takes the form of paper evaluation, focusing on the memorization of basic knowledge, while ignoring the assessment of students' comprehensive ability. This imbalance in the cognitive and affective systems of students, such assessment mechanisms, greatly reduces students' interest in learning ideological and political science classes, viewing it as an accessory to higher education rather than their real internalized needs. The low level of assessment and the imbalance of assessment content are common problems in high school ideological and political education. The lagging and detached practicality of the assessment incentive mechanism easily leads to the rigidity of students' thinking, which is not conducive to the cultivation of students' independent thinking ability. This written test assessment means greatly curbs the development and growth of students' thinking, and easily forms a bookish and dogmatic mode of thinking.

Judging from the evaluation of group cooperation, teachers only evaluate students for a certain inquiry problem, and lack timely evaluation of students' performance in group discussions, thinking methods, and innovative viewpoints. In the evaluation process, it is not timely and imperfect, and it lacks certain guidance. Teachers only evaluate the problem, and students only judge the right or wrong of their own views and behaviors on this basis. To a

large extent, it is easy to provoke students' frustration, which is not favorable to the effective operation of cooperative learning, resulting in the teacher's lack of leading role in the whole evaluation process, which cannot realize the maximum combination of teaching and learning and is contrary to the purpose of cooperative learning, and is not conducive to the establishment of an efficient classroom and the cultivation of students' thinking and innovation ability.

In a certain sense, the relationship between teaching methods and college theoretical classes of ideology and polity education is the commonality and individuality, general and individual relationship. Clarify the connotation of teaching methods is the prerequisite for comprehensive, in-depth and detailed elaboration of teaching methods of college Civic and Political Science class, while comprehensive, in-depth and detailed elaboration of teaching methods of college Civic and Political Science class is the enrichment and deepening of the understanding of teaching methods, the goal pursued by both is the same. That is, they both serve to improve the classroom teaching of college Civics class education.

The teaching method of college Civics is the main form of linking the teaching and learning of college Civics, and is the most obvious factor reflecting the relationship between teaching and learning of college Civics.

In addition to the basic connotations unique to the above teaching methods, the teaching methods of college Civics class should also take into account the nature and content of the college Civics course, which is the primary condition for the comprehensive elaboration of the teaching methods of college Civics class. The characteristics of teaching methods of college Civics and Political Science course are determined by the nature and content of college Civics and Political Science course.

8 POA Applications

The situation of the students surveyed is shown in Table 2.

Table 2: Surveyed students

Section	Departments	Male	Female	Subtotal	Total
Liberal Arts	Humanities	108	137	245	398
	Economy	57	96	153	
Scientific	Machinery	35	57	92	390
	Information	48	49	97	
	Automotive	39	58	97	
	Electronics	84	20	104	
Subtotal		371	417	788	788

We surveyed students' cognitive attitudes towards ideological and political courses. The specific situation is shown in Table 3.

Table 3: Students' attitudes towards "Civic Science Course" offered by universities

Options	Liberal Arts	Scientific
Very necessary	59.8%	65.4%
More necessary	34.8%	31.9%
Not really necessary	5.4%	2.7%
Not necessary	0.0%	0.0%

Table 3 shows that those who feel that ideological and political teaching is necessary, regardless of the arts and sciences, exceeded 90% of the respondents, and there is no student who thinks that ideological and political teaching is unnecessary.

The impact of ideological and political teaching on student growth is shown in Table 4.

Table 4: The impact of teaching Civics on students' growth

Options	Liberal Arts	Scientific
Very large	9.57%	28.97%
Larger	32.14%	49.24%
A little bit of impact	58.29%	21.79%
No	0.00%	0.00%

Table 4 shows that compared with liberal arts students, science students agree that "ideological and political teaching has an impact on life", and science students tend to have a "very large impact" in terms of the strength of the impact, while liberal arts students are just the opposite.

The reasons for students taking ideological and political courses are different, as shown in Table 5.

Table 5: Reasons for taking "Civics" classes

Options	Liberal Arts	Scientific
Like	28.46%	27.49%
Want to learn related knowledge	60.43%	52.18%
Get Credit	8.63%	20.33%
Passing the time	2.48%	0.00%

In addition, in order to test the feasibility of POA in ideological and political teaching, a corresponding ideological and political test was conducted on 108 freshman students. The students were divided into the experimental group and the control group. The results of the experimental group and the control group are shown in Figure 7.

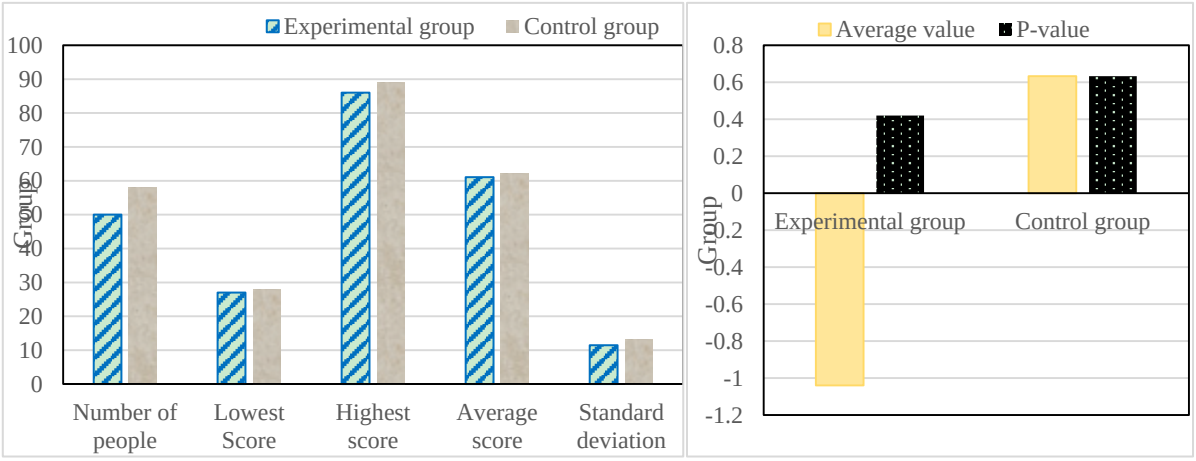
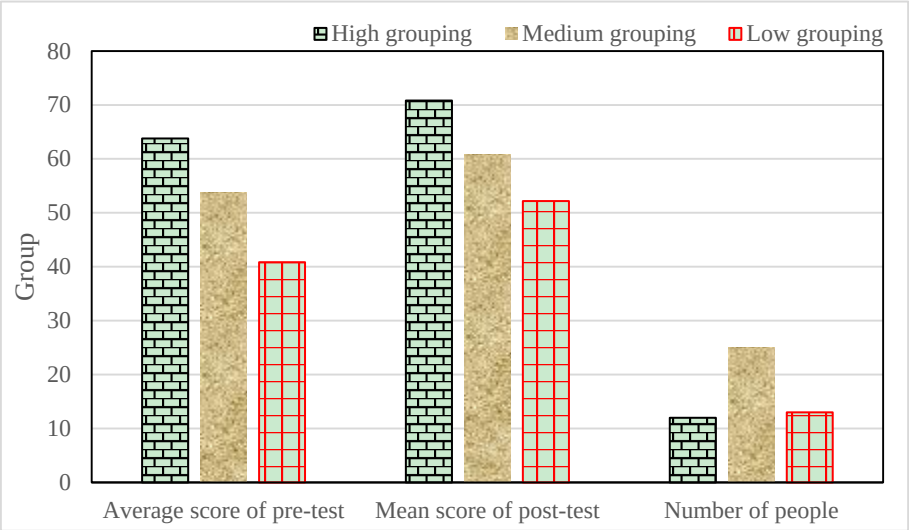


Figure 7: Student performance test situation

Figure 7 shows that the highest score of the experimental group is 86 points, the lowest score is 27 points, the average score is 61.07 points, and the highest score of the control group is 89 points. The lowest score was 28 and the average was 62.05, but overall there was no

significant difference.

The students in the experimental group were divided into groups (3 groups). The specific grouping situation and test results are shown in Figure 8.



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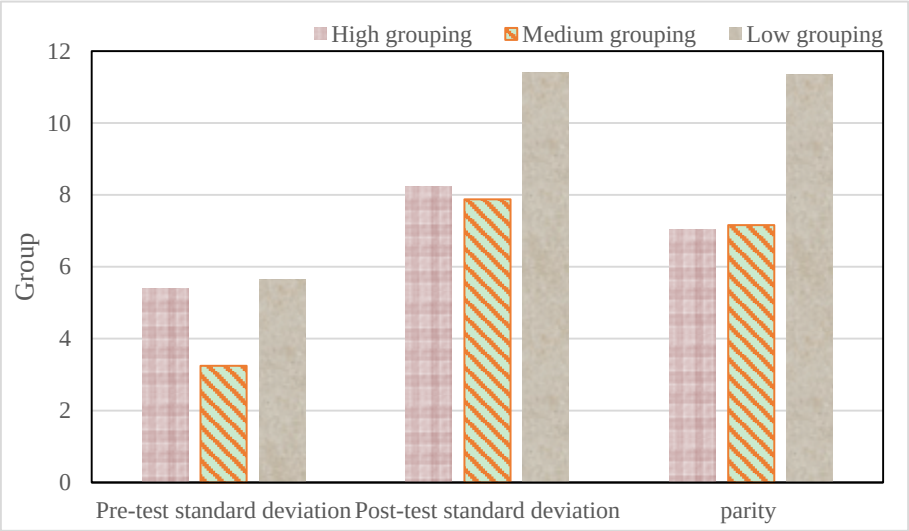
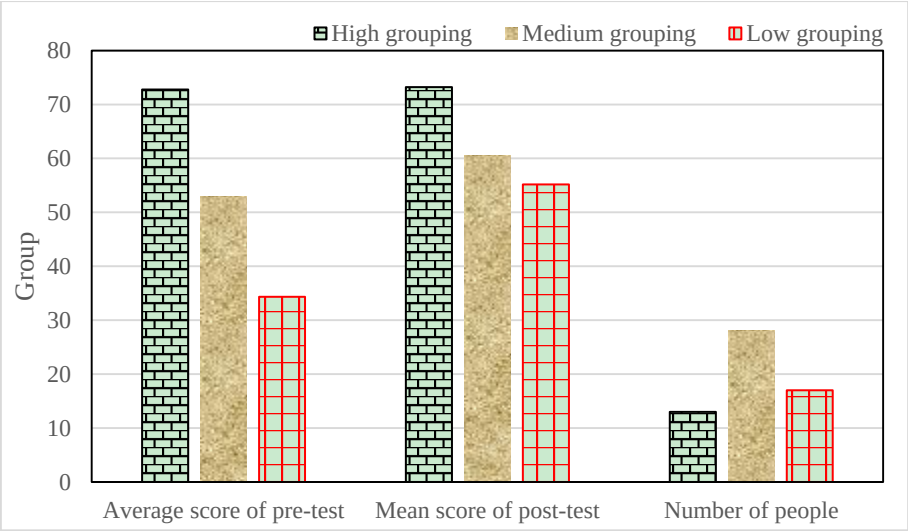


B

Figure 8: Comparison of test scores before and after the high, medium and low groups in the experimental group

Figure 8 shows that the high, medium and low pre-test average scores of the experimental group were 63.79, 53.69, and 40.83 points, respectively, and the post-test average scores were 70.82, 60.85, and 52.17 points, respectively. The pre-test standard deviations were 5.4, 3.244, and 5.646, respectively, and the post-test standard deviations were 8.235, 7.875, and 11.404. It can be clearly seen that the experimental group's performance has improved after using the POA teaching method.

The students in the control group were divided into groups (3 groups). The specific grouping situation and test results are shown in Figure 9.



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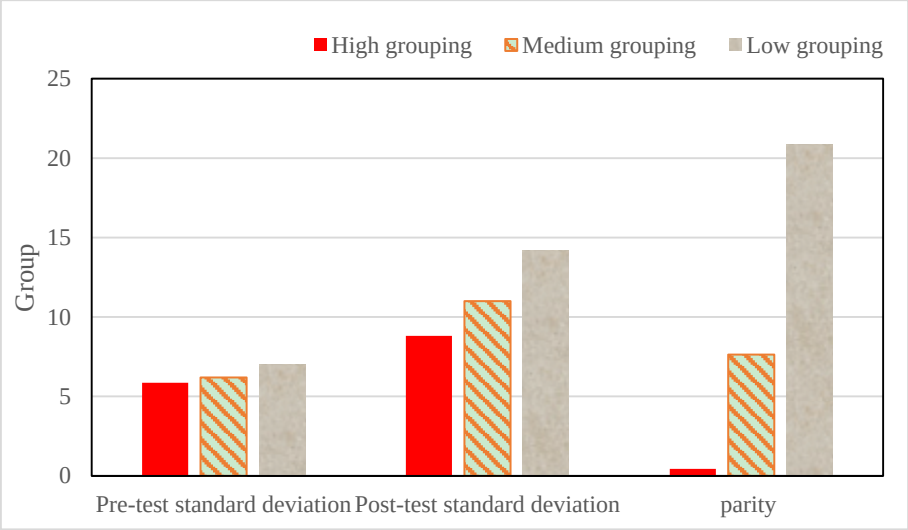
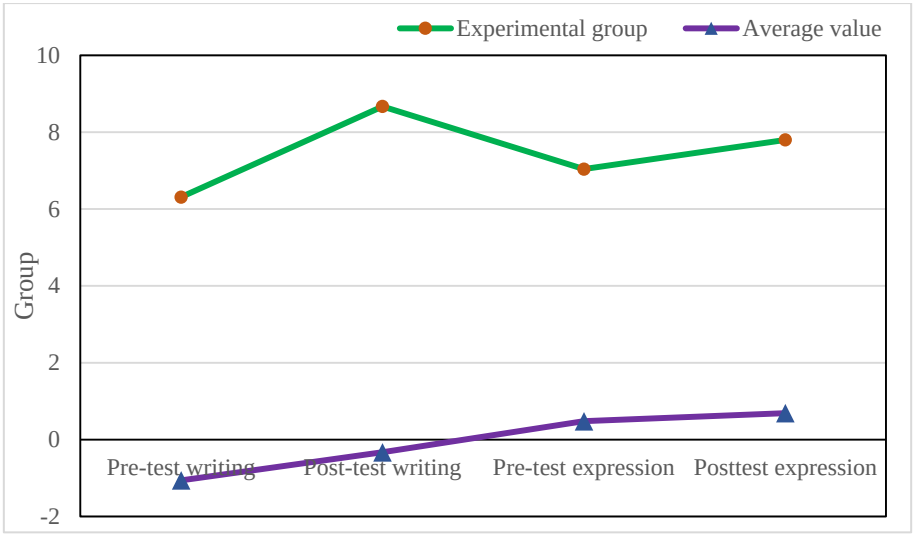


B

Figure 9: Comparison of test scores before and after the high, medium and low groups in the control group

Figure 9 shows that the high, medium and low pre-test average scores of the experimental group were 72.77 points, 52.87 points, and 34.33 points, respectively, and the post-test average points were 73.21 points, 60.50 points, and 55.18 points, respectively. The pre-test standard deviations were 5.863, 6.190, and 7.023, respectively, and the post-test standard deviations were 8.814, 11.001, and 14.180.

The changes in skills of the experimental group and the control group were compared, as shown in Figure 10.



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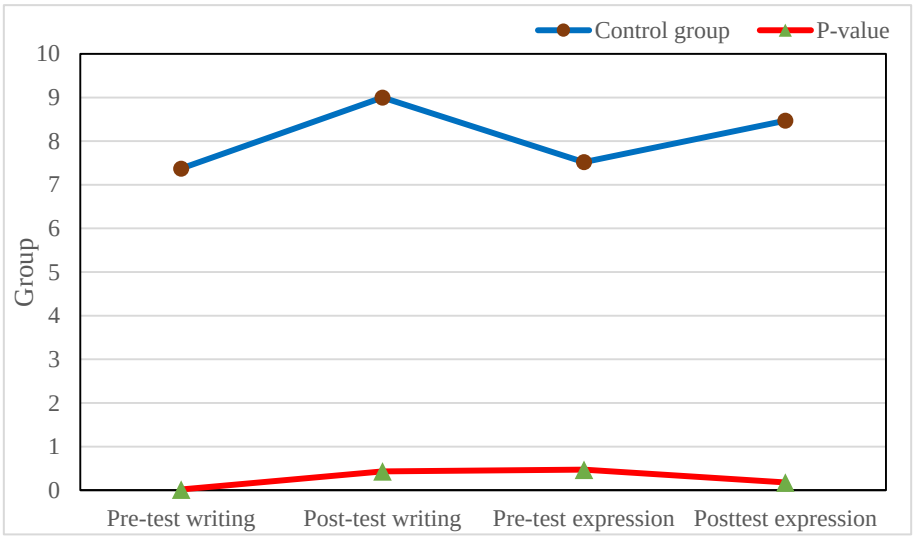

B

Figure 10: Comparison of the scores of the experimental group and the control group before and after the test of writing and expression skills

From Figure 10, it can be seen that the students in the experimental group improved greatly in writing skills, while the expression ability did not change much, which shows that POA has a certain role in promoting the improvement of writing ability.

9 Discussion

When we started to describe artificial intelligence, we originally wanted to add a specific definition of artificial intelligence, but there is no widely accepted definition of artificial intelligence for the time being. Therefore, after a brief introduction to the definition of artificial intelligence, the paper chose to give a certain description of its industrial characteristics, application and development impact. When summarizing POA, because the corresponding content is relatively small, and most of the materials are in English and are not

particularly used in this research, a brief description of its architecture is made.

10 Conclusion

The initial purpose of this study is to reform and innovate the teaching method of Civic Studies teaching. Through understanding the background of artificial intelligence and consulting various materials, we decided to try to apply the "output-oriented method" suitable for foreign language majors to Civic Studies teaching and to study the feasibility of this method in Civic Studies teaching. This paper first summarizes the history of the development of artificial intelligence and the research of artificial intelligence theory, and explains that artificial neural network theory is the main theoretical foundation in the field of artificial intelligence. Then the structure and learning algorithms of two neural network models, radial basis function network and Elman neural network, which are used in this paper are introduced. For the learning algorithm of radial basis function, the least squares method is selected for illustration; for the Elman neural network, the optimization search process of the smooth factor is introduced.

About the Author

Huijuan Zhang was born in Quanzhou, Fujian, China, in 1986, She is a lecturer in Fujian Preschool Teachers College, She received the bachelor's degree from Fujian Normal University, her master's degree from Fujian Normal University. Her research interest include Modern Chinese History and Ideological and Political Education for College Students.
E-mail: zhj2010@fjys.edu.cn

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