Curriculum and Teaching Methodology (2025)
Clausius Scientific Press, Canada

DOI: 10.23977/curtm.2025.080307
ISSN 2616-2261 Vol. 8 Num. 3

New Exploration of Interactive Teaching Mode of Ideological and Political Courses in Colleges and Universities Based on Green Development Concept

Huawei Wan[1,2]

[1]*School of Marxism, Hainan Vocational University of Science and Technology, Haikou, Hainan, 571126, China*
[2]*School of Marxism, Hubei University of Technology, Wuhan, Hubei, 430068, China*

Keywords: Green Development Concept, IAP Course, Shape Context Density Distribution Feature, Interactive Teaching

Abstract: Many problems in the teaching of ideological and political courses in colleges and universities show that the traditional teaching mode of ideological and political courses in colleges and universities cannot meet the requirements of high-quality development of ideological and political courses in colleges and universities in the new era. To realize the high-quality development of ideological and political courses teaching in colleges and universities, it is urgent to reform the traditional teaching concept of ideological and political theory teaching in colleges and universities, and explore a new teaching mode of ideological and political courses teaching in colleges and universities. This paper puts forward an interactive teaching mode of ideological and political course in colleges and universities based on the concept of green development, aiming to realize the high-tech network technology innovation of traditional ideological and political course teaching mode in colleges and universities. In this paper, the gesture recognition algorithm of interactive teaching SCDDF (shape context density distribution feature) is used to identify and process teachers' gestures. The algorithm captures and processes the gesture images of teachers, which greatly improves the teaching efficiency. According to the experimental survey, as many as 38.2% and 42.7% of the students believe that the interactive teaching of ideological and political courses in colleges and universities is very necessary, while only 8.5% of the students think it is unnecessary. This shows that the interactive teaching of ideological and political courses in colleges and universities has been affirmed by most students. In addition, 53.8% and 35.5% of the students believe that the interactive teaching of ideological and political courses in colleges and universities is very helpful and slightly helpful to their learning. It can be seen that interactive teaching can stimulate students' enthusiasm for the study of ideological and political courses and improve the ideological and political quality of college students. The experimental results show that the interactive teaching mode of ideological and political courses based on the concept of green development is an effective measure to achieve high quality development of ideological and political courses in colleges and universities.

1. Introduction

In recent years, the teaching innovation of IAP courses in universities has attracted wide attention from all walks of life. The green concept of development has been applied to the teaching of IAP courses, which is conducive to keeping pace with the times. This not only expands the teaching ideas, but also optimizes the related theories of the IAP course, and promotes the improvement and development of the teaching system of the IAP course. At present, China has made a lot of achievements in the research of related topics of IAP course teaching, which can effectively face the current teaching problems. However, because of the rapid development of electronic information technology, facing the current complex network electronic information environment, the traditional IAP teaching methods in the past naturally show many problems. Therefore, it is urgent to seek a new way of IAP teaching by combining the current excellent green development concept with the traditional IAP course teaching. However, at present, the research on IAP course teaching under the background of green development concept is still in its infancy.

Since entering the modern society, network technology has developed rapidly. Many scholars have made scientific research on the teaching methods of IAP courses. Xia H put forward a teaching system of IAP course of chemical engineering course based on micro-video through the application field of big data technology. The system perfectly realized the systematization of teaching. Referring to the course of Light Chemical Equipment and Design, he pointed out the main ideas of the system to design the key functions of the system and insert the IAP ideas into the whole syllabus [1]. Wu X conducted in-depth research in China's education system. He believed that IAP teaching has always been an important part of teaching, which has a certain relationship with educational objectives. The current educational philosophy is to integrate IAP teaching into daily teaching, that is, comprehensive teaching based on online and offline [2]. Pan C's research combined the content of critical methods in textbooks with the types of texts. He tried to explore how to use critical method to explore the intention in the text, and at the same time showed the IAP thoughts in the text. In order to find out feasible teaching methods, he selected excerpts as a case study [3]. Qiu C believed that in the education and teaching system of Chinese universities, the IAP course, as the core content of the curriculum education system, could help students establish a scientific and correct outlook on life and values, and could improve their personal moral quality and overall development. Looking forward to the future in the new era, the reform of China's higher education management system should be constantly optimized and upgraded [4]. The above results have studied the IAP course teaching from various aspects and pointed out some directions to study the field of IAP teaching.

Today's technology is developing rapidly. The research on IAP course teaching based on the concept of green development is a very novel proposal. Many scholars have made a deeper research on the teaching mode of IAP course on the level of green development concept. Zhou J believed that in the teaching of computer network courses, university teachers should constantly change their thinking mode, actively use green thinking mode and develop innovation to update the teaching content of network courses, so as to constantly optimize the system and break through the limitations of traditional teaching. He explored the reform direction and research direction of computer network IAP teaching under the innovative idea. Based on the relevant practical background and IAP teaching theory, the computer majors in University of Science and Technology were investigated. On this basis, he put forward the reform methods and strategies of IAP teaching in online courses, and put forward the reform approach and development direction of IAP teaching in online courses. The results showed that, in the era of entrepreneurship and innovation, it was necessary to reform the teaching contents and methods of computer network courses on the basis of cultivating students' innovative practical ability, so as to realize seamless connection and integrate

IAP education into computer network teaching mode[5]. Based on the background of the Internet, Cheng P discussed the teaching practice of the political and ideological course of textbook from the aspects of teaching philosophy, green sustainable development thought, teaching design, teaching process and teaching evaluation mechanism. This could effectively improve students' IAP participation and satisfaction, thus improving the teaching effect of IAP theory course. It provides some reference for other IAP education reforms, and brings new opportunities for the development of materials major [6]. Although the above experts' research is comprehensive, it is only superficial, without further research.

At present, the traditional teaching methods of IAP courses have some difficulties, such as the vague orientation of the course objectives, the lack of scientific and systematic thinking, the failure to slowly integrate "IAP elements" into professional courses, and the failure to formulate teaching plans with high implementation. In today's rapid development, the teaching methods of IAP courses also need to be in line with the latest cutting-edge science and technology.

2. Background and Significance of IAP Course Teaching

2.1 Significance of IAP Course Teaching

(1) Theoretical significance

First, the concept of green development is combined with IAP courses in colleges and universities. Its application strategies are explored from different angles, so as to make up for the lack of theoretical research on this issue. This research is of great significance [7-8]. The concept of green development has been expanded and explained. The concept of green development is a new understanding and new perspective of sustainable development. This is a new era in which the party and the country have summed up historical experience, analyzed the present situation of development and combined with China's unique social practice. The exploration of the application strategy of integrating green development concept into IAP courses in universities not only conforms to the current national conditions, but also helps to enrich the related achievements of green development concept.

Secondly, the IAP course in the school not only carries out the line, principles and policies of the party and the state, but also conveys the current events in politics and life, and interprets the hot issues in real politics. As the educational content of IAP courses in universities, the concept of green development not only helps IAP courses in universities keep pace with the times, expands the educational concept of IAP courses in universities, but also helps to optimize related theories.

(2) Practical significance

First of all, the concept of green development is integrated into the IAP course in universities, which can not only expand students' knowledge and improve their learning efficiency, but also help to improve students' political discipline level [9-10]. The core literacy is improved to enhance students' understanding of national key policies and overall strategies, so as to have a high sense of identity with the policy layout.

Secondly, the party and the state put forward higher requirements for the teaching of IAP courses in universities, and higher standards for teachers' teaching ability. The integration of green development concept into IAP courses in universities not only deepens teachers' understanding of educational content, improves their enthusiasm for teaching, but also deepens their exploration of teaching content. By increasing educational resources, the pertinence and effectiveness of teachers' classroom teaching are improved. The exploration of the application strategy of green development concept in IAP courses in universities not only has a positive impact on the development of college students, but also provides some reference for specific classroom practice, which plays a key role in improving students' political literacy.

To sum up, the significance of IAP course teaching is divided into theoretical significance and practical significance, respectively, from the educational role of IAP course in universities to college students and the governance concept of the country. Among them, the significance of IAP course teaching is shown in Figure 1.

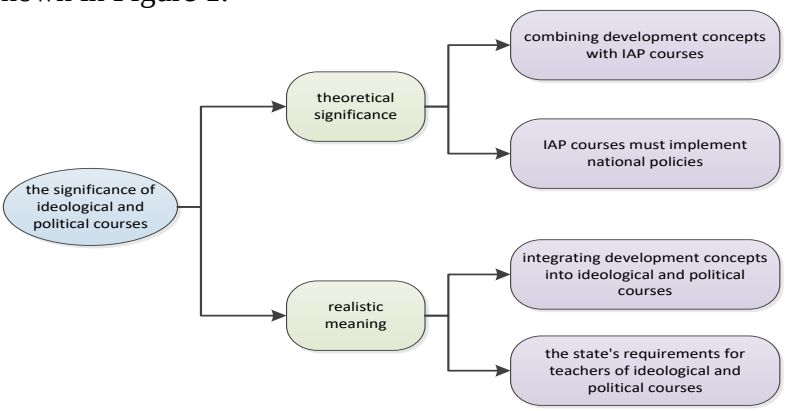

Figure 1. Meaning map of IAP course teaching

2.2 Role of IAP Course Education

(1) Civic education

Civic education refers to the quality education that citizens receive, which is conducive to cultivating citizens' good quality and moral character [11]. In essence, civic education includes citizens' ideological and moral, scientific education, cultural and political knowledge, legal and economic knowledge, life and social concepts, physical and mental health, etc. All civic issues can be said to belong to the research field of civic education. The key research object of IAP education is the political and ideological problems in the field of civic thought. Generally speaking, the ultimate goal of civic education is to cultivate capable citizens. Its core is to promote the development of human quality.

(2) Moral education

Moral education has always been the key education in IAP courses, which focuses on exploring students' thirst for knowledge and moral needs [12]. When teaching moral education, it should not only stay at the theoretical level of teaching, but also be reflected in the credibility. Students' moral thoughts have many functions in real life. Only moral contradictions and moral events in real situations can make students realize their importance most effectively. Therefore, these real-life contents should be the inspiration for college teachers in moral education. Only through rational application and guidance, moral education can be more vividly presented to students, thus stimulating students' psychological and moral demands. Recessive moral education curriculum plays an important role. These influences affect students' future self-development, and their influences are becoming more and more important in many fields of society.

(3) Patriotism and values education

Besides paying attention to moral education, college classrooms also pay special attention to students' psychological character development [13]. Among many emotional types, patriotism education is the most important one. The formation of college students' three views is a field that can not be ignored in the education system. It is not difficult to see that the strength of a country cannot be separated from the unity of the people. Therefore, patriotism is one of the contents that must be mastered in college IAP courses. Patriotism education starts from the psychological level of inducing citizens' emotions. An environment with a patriotic atmosphere is created. The political system and the state system are regarded as the core, providing a common object for the general

citizens' psychological concepts.

3. Development of the Concept of Green Development

3.1 Connotation of the Concept of Green Development

The concept of green development includes building a green economy, creating a green environment, learning green humanities and other concepts [14]. The concept of green development includes different human consciousness. Consciousness plays an active guiding role in people's daily activities. The awareness contained in the educational connotation of green development concept can guide people to take ecological actions. In the process of maintaining ecological civilization, the connotation of the concept of green development should be deeply understood, and the value orientation contained in this concept should be known. In addition, it needs to know the main principles and fundamental concepts of green development, so as to truly understand the concept of green development.

(1) Value orientation: harmonious development between man and nature.

As a part of nature, human beings are closely related to nature. When human beings are transforming nature, they are also transforming themselves [15]. As a part of nature, human beings should love nature, respect the earth's nature and protect the environment. The value orientation of harmonious development between man and nature need to be recognized. That is to say, to respect nature, human beings cannot blindly seek resources from nature, nor can they break the dynamic balance of harmonious coexistence between man and nature. To adapt to nature, it needs to transform the natural world, but don't have to violate the original laws of nature. That is to say, human being can't blindly exercise subjective initiative, and it is forbidden to transform nature at will. In addition, human beings should protect the natural environment, restore the ecological natural system to the maximum extent, and keep the original nature and integrity of the environment as much as possible. The sustainable development of harmonious symbiosis between man and nature need to be realized, so as to make harmonious symbiosis the final destination of the relationship between man and nature. Therefore, the value orientation of harmonious development between man and nature is very important. The relationship between man and nature must always be remembered and correctly understood. The green development road must be taken, and efforts should be made to build a living community where people and nature coexist harmoniously.

(2) Main principle: sustainable development

The way of production and life in the industrial age has had a serious impact on the natural environment and destroyed the balance between man and nature. Therefore, all kinds of environmental crises caused by it have a serious impact on the living environment of human beings. Human beings can't ignore the endurance of nature, but excessively satisfy their unreasonable needs or selfish desires for wealth. In the increasingly polluted living environment, the implementation of the concept of sustainable development becomes more urgent. The ultimate goal of low-carbon development is balance. The principle of low-carbon sustainable development must be implemented continuously. Among them, the development of circular economy and low-carbon economy are the essential characteristics of green economy. Harmony between man and nature is the premise of human existence and development. It is urgent to implement the concept of sustainable development in all aspects of social life. Therefore, the essence of low-carbon sustainable development is the concerted efforts of all mankind to keep in mind the concept of green and low-carbon life. It is necessary to maintain the healthy living behavior of all mankind and promote the green demand to create a new low-carbon life.

To sum up, the connotation of the concept of green development includes valuable orientation and main principles. Its detailed concepts are the concept of harmonious development between man

and nature and the concept of low-carbon sustainable development. The connotation of green development concept is shown in Figure 2.

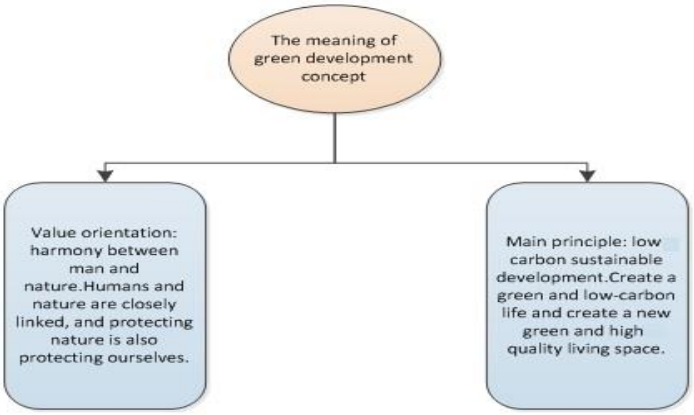

Figure 2. Implication of the concept of green development

4. Gesture Recognition Algorithm Based on Interactive Teaching

4.1 Basic Introduction of SCDDF Gesture Recognition Algorithm

Gesture recognition technology can be applied to interactive teaching, which can capture and recognize teachers' interactive gestures. Traditional gesture recognition algorithms generally have the problem of low recognition rate of similar gestures. Aiming at this deficiency, the classical DDF algorithm and shape context retrieval algorithm have been effectively improved, and the SCDDF recognition algorithm has been studied. Combining the advantages of other algorithms, the recognition rate of this algorithm is as high as 96%, which greatly improves the recognition accuracy. On this basis, the dynamic gesture processing is enhanced by calculating the first and last frames and the middle frames of the gesture image. This is very important for the application of teaching, which is used as supplementary logo in interactive teaching interface.

4.2 Implementation of the Gesture Recognition Algorithm of SCDDF

Gesture images are described by feature vectors.

$$\mathrm{SCDDF} = \left(\overrightarrow{OM}; r_1, \ldots r_M; dr_1, \ldots, dr_M; \theta_i \right) \tag{1}$$

In the formula, $\overrightarrow{OM}$ is used to indicate the main direction information of the human hand. The main direction of the gesture refers to the vector from the centroid of the gesture to the farthest point of the gesture. Its main function is to ensure that the extracted gesture information is not affected by hand rotation. No matter how the gesture direction changes, the correct gesture information can be captured. This also ensures the consistency of extracted features.

Secondly, vector r_1 represents the direction of the pixel in the gesture image. Vector $\mathrm{d}r_1$ is the result of the first-order numerical difference between r_{1+1} and r_1 in the vector. Vector θ_1 is the angle between the centroid of each finger and the main direction of the gesture.

The specific methods to deal with the characteristics of SCDDF are as follows:

First, the centroid point of the target image is calculated as:

$$\bar{x} = \frac{\sum_i \sum_j i \times f(i,j)}{\sum_i \sum_j f(i,j)} \tag{2}$$

$$\bar{y} = \frac{\sum_i \sum_j j \times f(i,j)}{\sum_i \sum_j f(i,j)} \tag{3}$$

The coordinate of the centroid point of the image is $O\left(\vec{x}, \vec{y}\right)$.

Then, the pixels in each gesture sub-image are calculated separately. The total number of human hand pixels $S_i (i = 1, \ldots, M)$ in each sub-image is counted to determine the maximum value of S_i.

$$S_{\max} = \max_{i=1,\ldots,M} \left(S_i\right) \tag{4}$$

Secondly, the eigenvector is calculated:

$$r_i = S_i / S_{\max} (i = 1, \ldots, M) \tag{5}$$

$$\mathrm{dr_i} = \begin{cases} |\mathrm{r_1} - \mathrm{r_2}| & \mathrm{i} = 1 \\ |2\mathrm{r_i} - \mathrm{r_{i-1}} - \mathrm{r_{i+1}}| & \mathrm{M} > \mathrm{i} > 1 \\ |\mathrm{r_M} - \mathrm{r_{M-1}}| & \mathrm{i} = \mathrm{M} \end{cases} \tag{6}$$

Because gesture changes are mainly related to fingers, palm changes are small, so the weight of finger recognition should be increased. In this way, the discrimination of different gesture feature maps can be increased, thus improving the recognition accuracy. The eigenvectors R and D are calculated as follows:

$$R = \left(r_1, \ldots r_{10}, ar_{11}, \ldots ar_{15}, br_{16}, \ldots br_{20}\right) \tag{7}$$

$$D = \left(dr_1, \ldots dr_{10}, cr_{11}, \ldots cr_{20}\right) \tag{8}$$

5. Experiment and Test of Interactive Teaching of IAP Courses in Universities

5.1 Connotation and Value of Interactive Teaching of IAP Courses

(1) Connotation

The interactive teaching of IAP theory course overcomes the limitations of indoctrination and other teaching methods, which is different from the traditional teaching methods. Interactive teaching process is an interactive process in which teachers and students explain the curriculum through dialogue. Besides, teachers and students are equally important in interactive education. In interaction, teachers and students should respect each other, actively communicate and cooperate on an equal footing.

Generally speaking, interactive teaching, also called mutual teaching, focuses on the interaction between teachers and students' psychology and behavior in teaching. In addition to the process of personal interaction with others or groups, the process of interaction must also include self-talk and reflection.

To sum up, although the definition of interactive education emphasizes the interactive role of educational subjects in the process of education, there are also differences between teachers and students, educational undertakings, educational environment, and relationships with other objects in the interactive process. Therefore, this paper concludes that the key to interactive teaching of IAP theory courses in universities lies in teaching behavior and dialogue between teachers and students.

It is necessary to promote the adjustment and optimization of teaching resources to form a harmonious atmosphere of teaching, so as to achieve the effect of dialogue between both sides and mutual learning between teaching and learning.

5.2 SCDDF Gesture Recognition Algorithm

In order to study the recognition accuracy of the SCDDF gesture recognition algorithm, this experiment adopts the experimental method of before and after comparison. The accuracy of gesture image recognition before and after the teaching of gesture recognition with SCDDF is tested.

This experiment selects the same teacher and teaches the same course content and the same course duration. This can shield the influence of external factors on the experiment to the greatest extent. The experimental results are shown in Figure 3.

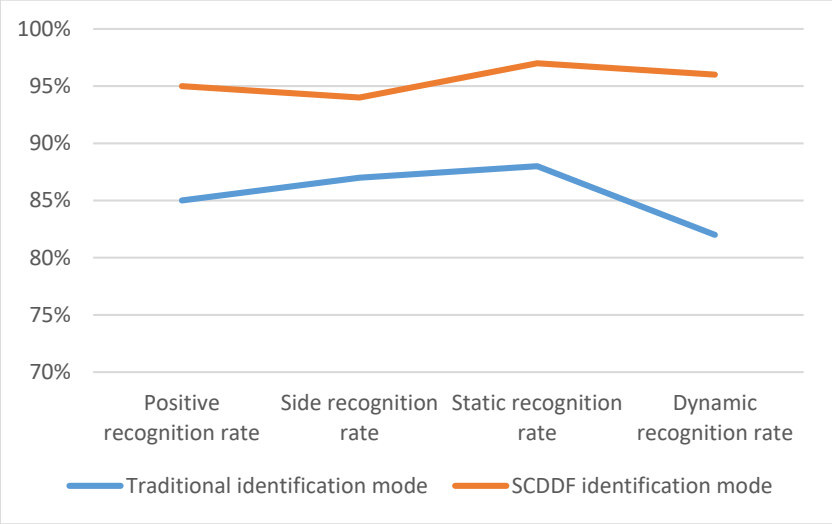

Figure 3. Accuracy comparison of two gesture recognition algorithms

As can be seen from Figure 3, the front recognition rate, side recognition rate, static recognition rate and dynamic recognition rate of the SCDDF gesture recognition algorithm are 95%, 94%, 97% and 96% respectively. This shows that the recognition rate of gesture images using SCDDF gesture recognition algorithm is higher than that of traditional recognition methods.

5.3 Experiment of Interactive Teaching of IAP Courses in Colleges and Universities

This study investigates the interactive teaching of IAP courses based on green development through a survey conducted among students at a university. The respondents include randomly selected freshmen, sophomores, and juniors to ensure representativeness. The survey focuses on two main aspects: students' recognition of interactive teaching theory in IAP courses and its practical effectiveness, aiming to evaluate both the theoretical and practical feasibility of this approach. To ensure validity, a pilot test involving 10 questionnaires was conducted before large-scale distribution. The anonymous survey method was employed, supplemented by oral interviews and observations, with questionnaires proportionally distributed across grades. Out of 220 questionnaires distributed, 210 were collected, with 205 valid responses, yielding an effective rate of 93.2%. Students' views on the necessity of interactive teaching of IAP courses are shown in Figure 4.

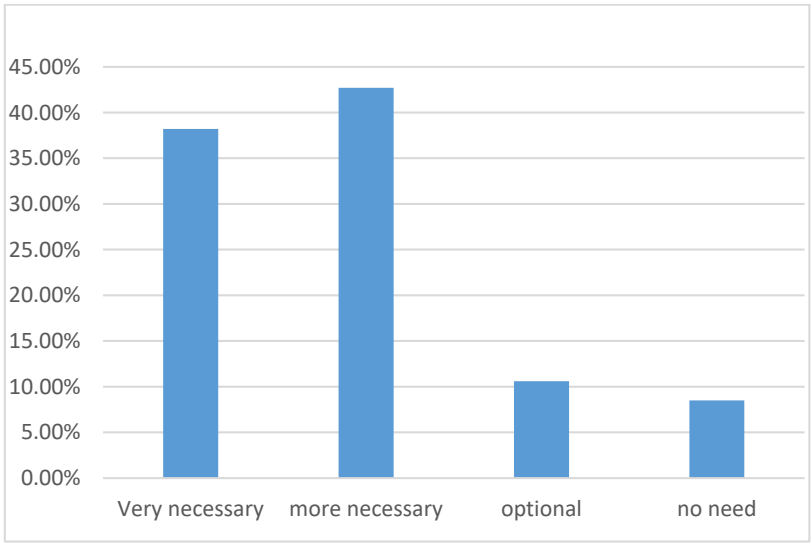

Figure 4. Investigation on the necessity of interactive teaching of IAP courses

As can be seen from Figure 4, up to 38.2% of students think that interactive teaching of IAP courses is very necessary. 42.7% of students think that interactive teaching of IAP course is more necessary. Only 8.5% students think that the interactive teaching is unnecessary. More students affirms the interactive teaching mode, which provides powerful help for the implementation of the teaching experiment. This fully shows that the interactive teaching of the IAP course has been welcomed by the majority of students, which is of practical significance for promoting interactive teaching in the IAP course.

In addition, the practical teaching effect of this interactive teaching on students should also be known. The related survey is conducted again, as shown in Figure 5.

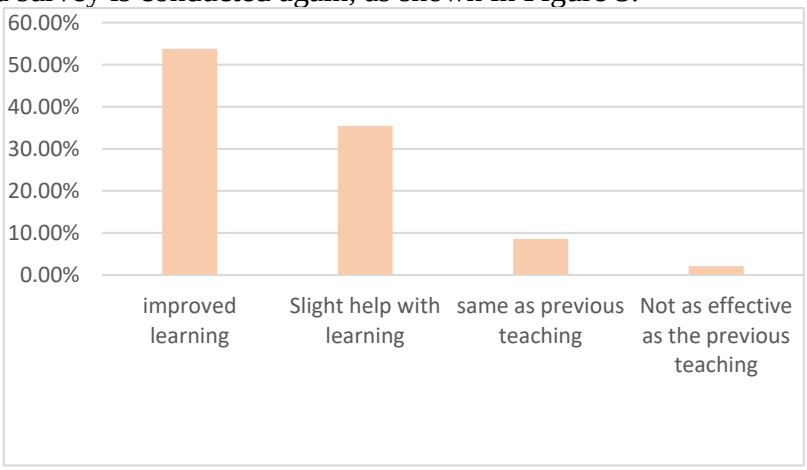

Figure 5. Investigation on the interactive teaching function of IAP course

As can be seen from Figure 5, 53.8% of the students think that interactive teaching can improve the effect of IAP study. 35.5% of the students think that the interactive teaching is slightly helpful for learning IAP courses. In addition, only 2.1% students think that the interactive teaching method is inferior to the previous teaching method. When preparing lessons, teachers design interactive teaching plans according to the contents of textbooks and students' situation, which can stimulate students' enthusiasm for learning IAP courses. Through a period of teaching practice, the interactive IAP teaching effect is remarkable. Students' knowledge and ability have been improved to a certain extent.

6. Conclusions

Intelligent teaching technology of IAP course based on the concept of green development not only improves the efficiency of IAP course teaching, but also improves the stability of IAP course teaching, which has a remarkable effect in the experiment of interactive teaching of IAP course. This interactive teaching of IAP course has provided a good free and free teaching atmosphere, so that learners can change from traditional passive learning to active IAP learning, thus reducing students' learning pressure on IAP teaching. The interactive teaching of IAP course based on the concept of green development effectively has improved the efficiency and learning interest in the teaching process. However, this system has a shortcoming, that is, it needs strong processing ability to deal with complex learning information and analyze all kinds of information in teaching. Therefore, a powerful processor is needed to support the interactive teaching mode of IAP course. Therefore, this system is not suitable for schools with poor processors, which is the deficiency of the interactive teaching of this IAP course. The advantages of the interactive teaching of IAP course, such as high efficiency, stability and immediacy, far exceed the traditional IAP teaching methods.

References

[1] Xia H. Research on Innovation of IAP Teaching Mode for Chemical Engineering Courses Based on Big Data Technology[J]. Journal of Physics: Conference Series, 2021, 1852(3):32001-32002.

[2] Wu X. Research on the Reform of IAP Teaching Evaluation Method of College English Course Based on "Online and Offline" Teaching[J]. Journal of Higher Education Research, 2022, 3(1):87-90.

[3] Pan C. A Case Study of Critical Approach Based IAP Teaching in English Text[J]. IRA International Journal of Education and Multidisciplinary Studies, 2021, 17(2):94-96.

[4] Qiu C. Research on the Ways of Integrating People-oriented Concept into IAP Teaching[J]. Journal of Education and Culture Studies, 2021, 5(2):1-10.

[5] Zhou J. IAP Teaching Reform of Computer Network Course Based on Thinking Innovation[J]. Journal of Physics: Conference Series, 2020, 1648(4):42112-42113.

[6] Cheng P, Yang L, Niu T. On the IAP Education of Material Specialty Courses under the Background of the Internet[J]. Journal of Higher Education Research, 2022, 3(1):79-82.

[7] Shang H, Hu C. Value Orientation and Development of IAP Education Based on Artificial Intelligence[J]. Journal of Physics: Conference Series, 2021, 1852(2):22083- 22085.

[8] LU, Jie. IAP Education in China's Higher Education[J]. East Asian Policy, 2017, 09(02):78-91.

[9] Wang S, Zhang T. Research on innovation path of school IAP work based on large data[J]. Cluster Computing, 2019, 22(S2):3375-3383.

[10] Guan Y. Research on the Reform of IAP Theory Courses in Colleges and Universities in the Big Data Era[J]. Journal of Physics: Conference Series, 2021, 1852(2):22061-22065.

[11] Zhang S. Research on The Path of IAP Education based on Computer in The Process of Constructing Campus Culture[J]. Journal of Physics: Conference Series, 2021, 1744(3):32233-32235.

[12] Gu B. Development and study on IAP online education platform of colleges and universities based on ".NET"[J]. Revista de la Facultad de Ingenieria, 2017, 32(15):148-153.

[13] Huang W, Wang D, Liu Z. Study on the Path of IAP Education in the Process of Training New Agricultural Science and Technology Talents[J]. Asian Agricultural Research, 2020, 12(8):3-6.

[14] Lin B. Importance of IAP Education in Teaching Fine Arts Education in Higher Vocational Colleges[J]. Journal of Contemporary Educational Research, 2021, 5(5):97-100.

[15] Lin L. Joseph Nye's Soft Power Theory and Its Revelation Towards IAP Education[J]. Humanities and Social Sciences, 2017, 5(2):69-74.