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Research on Personalized Teaching Mode of Computer-Assisted Civic and Political Education in Colleges and Universities

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SUMMARY: *The rapid development of information technology and the application of artificial intelligence in the field of education are becoming more and more widespread. This study explores the impact of computer-assisted personalized teaching mode on Civics education in colleges and universities by conducting an experiment on the Basic Principles of Marxism course in S University. The research subjects included 20 teachers and 60 students, and the data were analyzed by questionnaire survey method, mathematical statistics and comparative research method. The changes in the final grades of the experimental group and the control group showed that the average score of the experimental group increased by 10.06 points, while the control group increased by 3.85 points, and the difference was statistically significant (P<0.05). In addition, the experimental group also showed significant improvement in learning interest and motivation, with the mean score of learning interest increasing from 74.3 to 80.4 (P<0.01) and learning motivation increasing from 90.2 to 92.2 (P<0.02). The results of the study show that computer-assisted personalized teaching can effectively improve students' academic performance, learning interest and learning motivation, thus enhancing the teaching effect of Civic Education.*

KEYWORDS: *computer-assisted teaching, personalized teaching, Civics education, academic achievement, learning interest, learning motivation*

1 Introduction

Civic and political education in colleges and universities, as a key subject for students to establish values and cultivate the quality of life, has been actively emphasized in major colleges and universities [1]. However, in the traditional teaching mode of Civic and Political Education, students are in a completely passive learning state, unable to ignite their interest in learning, and it is difficult to absorb the teaching content. With the application of computers in education, computer-assisted teaching has become a hot topic, which provides a technical basis for the realization of personalized teaching in the Civics and Political Science class in colleges and universities [2-5]. Computer-assisted teaching mainly provides students with a more vivid and graphic teaching environment through learning software, multimedia teaching materials, interactive teaching, etc., which effectively improves students' learning interest and learning efficiency [6-8].

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Computer-assisted teaching, as the name suggests, is a teaching tool that plays on the efficacy of computers, assists or replaces the teacher to perform part of the teaching task, to teach knowledge and skills, and directly serves the students [9-11]. For most students, Civics education is a boring course to learn, and they have little interest in Civics learning, and once they encounter problems, they may develop negative emotions [12, 13]. In view of this situation, it is necessary to introduce computer-assisted teaching to inject new vitality and vigor into Civics and Political Science teaching, attract more students to participate in classroom teaching, and lay the foundation for the construction of efficient classroom [14-16]. At present, with the in-depth integration of ideological education and computer in colleges and universities, the personalized teaching mode of ideological education in colleges and universities is developing rapidly, especially when the computer continues to innovate and develop, and the application of a variety of new technologies in ideological education enriches students' individuality education [17-20]. The computer-based teaching platform can be based on students' individual needs, planning different learning methods, such as students who have mastered the content of this section of the Civics for the extension of the Civics knowledge, not mastered to strengthen the education, tailored to give full play to the significance of the Civics education under the big data to meet the students' individuality of teaching [21-24].

With the development of the times, the mode of higher education is constantly being revolutionized, especially the Civic and Political Education, which faces the problem of how to attract the attention of students and increase their interest in learning. Traditional Civics teaching is often lecture-based and lacks interactivity and personalized care with students, which makes some students reject the Civics course and affects the teaching effect. Therefore, how to effectively combine information technology, especially computer-assisted teaching technology, in order to improve the teaching effect of Civics and Political Science courses has become an important topic in the academic world. In this study, we chose Basic Principles of Marxism as the research object, and explored the application effect of this mode in Civics and Political Science courses by means of computer-assisted personalized teaching. Firstly, the starting level of the students in the two groups was analyzed through the pre-test of the experimental group and the control group. Subsequently, computer-assisted personalized teaching interventions were implemented, with the experimental group receiving customized personalized learning paths while the control group continued with the traditional teaching model. Finally, changes in students' academic performance, interest in learning, and motivation were assessed through a posttest, which was combined with statistical analysis to draw conclusions from the study. The innovation of this study is the use of a combination of computer-assisted instruction and personalized education in order to explore its enhancement of Civic Education.

2 Basic concepts

2.1 Computer-assisted individualized instruction

As can be seen through the personalized learning experience, AI technology plays an important role in computer-assisted instruction. With the help of analysis of students' learning data and behavioral patterns, AI systems are able to tailor the content and pace of instruction to each student's unique needs and ability level. This personalized learning experience can help students better understand and master knowledge, thus significantly improving learning efficiency. By accurately matching students' learning needs, AI can provide students with targeted learning resources, and students are able to learn at their own pace and in their own way [25].

2.2 Personalized teaching mode

2.2.1 Personalized Learning

There is no uniform definition of the concept of personalized learning in the academic world. Some researchers define personalized learning as a kind of learning in which students put themselves at the center of learning and adopt autonomous, exploratory, reflective and innovative learning methods in response to their own personality characteristics and development potential, so as to encourage each learner to obtain a learning that is suitable for his or her full, free and harmonious development. According to some data research studies, personalized learning mainly talks about student autonomy, comprehensive development of students, teacher guidance, etc. According to the definition of high relevance to the topic of this study, personalized learning is defined as follows: personalized learning refers to the learner-centered, using differentiated resources, open platforms, diversified interactions, and adopting autonomy, guidance, and diversified learning methods to promote the learning of students' personality traits and development potentials, Diversified learning mode, to promote each learner to obtain their own comprehensive development of a kind of learning [26].

2.2.2 Construction of personalized teaching mode

To achieve personalized teaching, artificial intelligence technology is used to develop personalized learning paths based on students' learning abilities, interests and goals. Intelligent algorithms can dynamically adjust learning content and progress based on students' learning behaviors and data to ensure that each student learns in a way that best suits him or her. Through the intelligent assessment tools of the smart education platform, teachers can monitor and assess students' learning progress in real time. The intelligent system can automatically generate personalized learning reports and provide instant feedback to help students understand their learning effectiveness and deficiencies. Teachers can use the smart education platform to provide diversified learning resources and content according to students' learning interests and needs, push learning materials that suit students' individual needs, and promote students' in-depth learning and independent exploration. The smart education platform supports collaborative learning and interaction among students, and encourages students to discuss and solve problems together through group discussions and project cooperation, so as to enhance the effectiveness of learning.

2.3 Civic Education in Higher Education

Civic education in colleges and universities embodies the work of being a human being from the core, and students receive the value guidance of Civic Education to set up a correct outlook on life, in the process of learning, students can be perfected physically and mentally to realize the all-round development. Civic and political education in colleges and universities is the main form of education in civic and political education, and is also a compulsory public course for college students, whose mission is to educate them in Marxist theory, guide them to set up the correct concepts, improve their ideological and political qualities and their ability to distinguish right from wrong and to solve practical problems. Since the reform and opening up, the theoretical research and practical exploration of Civic and Political Education in colleges and universities has been a key topic of academic concern, and Civic and Political Education in colleges and universities needs to be combined with the actual situation of students to form a coordinated and cooperative working pattern. Through learning the contents of Civic and Political Education, students can make clear what kind of person they should become, and through personalized learning, students' levels and qualities will be improved continuously to

achieve all-round development. In addition, there is a hidden nature in the way of learning Civics and Politics, and through personalized learning, students can realize the perfection of their personality, spiritual sensitization and spiritual transformation, and the cooperation between teachers and students is conducive to students' deep understanding of Civics and Politics.

3 Research methodology

3.1 Subjects of study

Taking the recognition and application effect of the university public ideological and political course "Basic Principles of Marxism" as the research object, 20 teachers and 60 students participated in the university public ideological and political course "Basic Principles of Marxism" in S University. Among them, there were 30 students in the experimental group and 30 students in the control group.

3.2 Research methodology

3.2.1 Mathematical and statistical methods

The data were statistically analyzed and processed using Excel software and SPSS19.0 Chinese software to ensure the accuracy of the data statistics.

3.2.2 Questionnaire method

This paper mainly uses the questionnaire method to obtain data. The design of the questionnaire is strictly in accordance with the theoretical standards of quantitative research methods, and two questionnaires are designed for teachers and students to understand the situation of computer-assisted physical education from different perspectives. Through the evaluation of the experts, the questions with high recognition rate were retained, some questions with low recognition rate were excluded, and the questionnaire content was further determined by combining the suggestions of the experts. The validity test of the questionnaire is shown in Table 1.

The questionnaire of this study was tested by the Telfer method, and the validity test of the questionnaire was carried out on 13 experts of the students' questionnaire and 11 experts of the teachers' questionnaire, and the validity test of the questionnaire was carried out, and in order to ensure the quality of the questionnaire design, the content of the questionnaire and the questionnaire structure were tested after the questionnaire was designed. Reflecting the level of questionnaire content and structural validity, 6 experts considered the questionnaire to be very effective in terms of the content validity of the student questionnaire, 4 experts considered it to be effective, 3 experts considered it to be average, and 0 experts considered it to be less effective. Regarding the structural validity of the students' questionnaire, 5 experts thought it was very valid, 5 experts thought it was valid, 3 experts thought it was fair, and 0 experts thought it was not very valid. Regarding the content validity of the teachers' questionnaire, 5 experts considered the questionnaire to be very valid, 4 experts considered it to be valid, 2 experts considered it to be fair, and 0 experts considered it to be not very valid. As for the structural validity of the teachers' questionnaire, 4 experts thought it was very effective, 4 experts thought it was effective, 3 experts thought it was average, and 0 experts thought it was not very effective. It can be concluded that the questionnaire's design basically meets the requirements of the standards of sports research and that the questionnaire has a reliable content validity and structural validity.

Table 1: Questionnaire survey validity test

Student questionnaire survey validity test table					
Validity	Very effective	In effect	General	Not very effective	Ineffectiveness
Content	6	4	3	0	0
Percentage	46.15%	30.77%	23.08%	0%	0%
Structure	5	5	3	0	0
Percentage	38.46%	38.46%	23.08%	0%	0%
Teacher questionnaire survey validity test table					
Validity	Very effective	In effect	General	Not very effective	Ineffectiveness
Content	5	4	2	0	0
Percentage	45.45%	36.36%	18.19%	0%	0%
Structure	4	4	3	0	0
Percentage	36.36%	36.36%	27.28%	0%	0%

The results of the questionnaire validity expert structure statistics are shown in Table 2, 20 teachers and 60 students. The two surveys were processed with SPSS19.0 Chinese software, and the reliability correlation coefficients of the student questionnaire were r=0.845, and the correlation coefficients of the teachers' questionnaire were 0.863, which were above 0.8 ($P<0.01$), and the results of the surveys reached the standard of reliability required by measurement and statistics, and the questionnaires were highly reliable.

Table 2: Questionnaire distribution and recovery table

Survey object	Issue (part)	Recovery (part)	Effective questionnaire	Effective recovery rate
Teacher	20	20	20	100%
Student	60	60	60	100%

Experts and scholars were consulted in face-to-face and telephone interviews on the research ideas, research methods, teaching design, selection of scale indicators, establishment of evaluation conditions, design of questionnaires, and validity and reliability of the questionnaires of this dissertation.

3.2.3 Comparative research methods

The conclusions of this experiment were drawn through a pre and post-test cross-comparison analysis of the questionnaires of the traditional teaching class (control class) and the computer-assisted personalized teaching class (experimental class), and a pre and post-test of the experimental and control classes in the form of questionnaires, and a pre and post-test comparative analysis of the final grades of the university's public Civics course “Basic Principles of Marxism”.

3.2.4 Logical analysis

In the analysis of the literature, the statistics of the data and the writing of the thesis, the logical methods of comparison and analysis, induction and deduction, analysis and summarization were comprehensively applied. These logical analysis methods provide a guarantee for the successful completion of the thesis, and also create conditions for the comprehensive analysis of the thesis.

4 Findings and analysis

4.1 Comparison of final grades

In order to better control the experimental variables, a pre-test comparison was made between the experimental group and the control group, with class A being the computer-assisted Civics personalized teaching class, i.e., the experimental group, and class B being the traditional teaching class, i.e., the control group. SPSS data processing was carried out to analyze the changes in Civics scores in the pre-test and post-test comparisons between the experimental group and the control group. Observe whether there is a significant change in the difference in the overall level of students' Civics achievement between the experimental group and the control group after the computer-assisted personalized teaching in the post-test. Compare and contrast the Civics scores in the pre and post-tests to observe whether there are significant changes in the Civics scores. The experimental process is divided into pre-test and post-test.

4.1.1 Results of final grades

The results of the final results are shown in Figure 1, before the study, the experimental group and the control group were pre-tested, and the students in both groups were tested on the Civics exam. Each Civics questions were selected from the first-year university Civics library, and each test Civics questions totaled 10 questions, and the test time was 10 minutes. Statistical results can be obtained from the pre and post-test scores of the experimental group control group. The sample size of the pre-test in the experimental class was 30 and the sample size of the post-test was 30, and the sample size of the pre-test in the control class was 30 and the post-test was 30. In the two tests administered to the experimental and control classes after a three-month instructional intervention for both groups of students, there was an overall improvement in the mean scores of the pre-test and post-test for the experimental class and an overall improvement in the mean scores of the pre-test and post-test for the control class, on the same scoring system. In the experimental class, the average grade increased by 10.06, and in the control class, the average grade increased by 3.85, from the top of the improvement, the improvement of the experimental class is larger than the experimental class, and then look at the P-value, the independent samples T-test of the Civics scores of the two classes found that in the experimental pre-test P-value is greater than 0.05, so there is no difference in the pre-test scores of the experimental and the control classes, while in the post-test data T-test for the experimental and the control class in the post-test data t-test, the p-value is less than 0.05, so there is a difference between the post-test scores of the experimental and control classes.

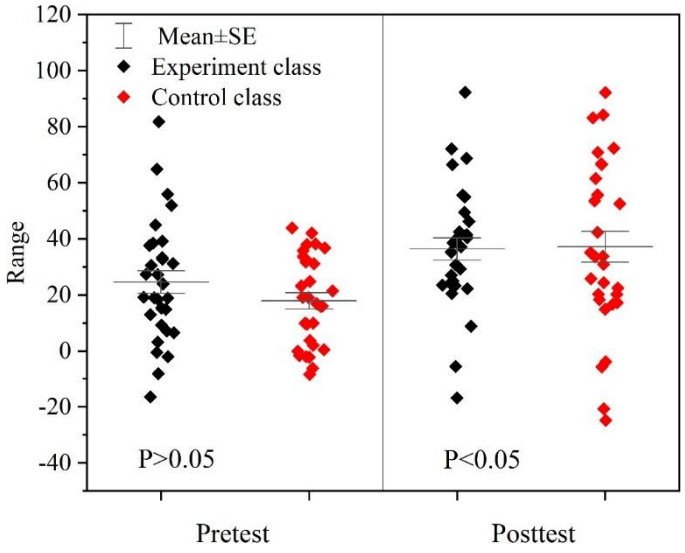

Figure 1: The control group of the experimental group was alone

4.1.2 The impact of computer-assisted personalized instruction in Civics on academic performance

The average scores of both classes in the pre-test were lower because most students could finish the questions, but not many of them could get the questions right, and the students felt that it was difficult and unfamiliar with this type of questions when they were exposed to Civics for the first time. And after a 4-month teaching intervention, and then the Civics post-test experiment, the students were still the same as the pre-test did not have Civics class and Civics training, and in the post-test also gave the students the same Civics questions from the pre-test, according to the memory research curve, after 4 months, the students had no impression of the Civics test questions. The performance of the students in the computer-assisted personalized teaching class in the post-test, $p<0.05$, indicates that there is a difference between the performance of computer-assisted personalized teaching class and traditional teaching class in Civics, and the performance of the computer-assisted personalized teaching class is better than that of the traditional teaching class because of the use of the convenience of the fast transmission speed of the computer, do more exercises than the traditional teaching class, and the qualitative change from quantitative change, the Civics ability will be Strengthened. Computer-assisted personalized teaching is more effective than traditional teaching in improving students' performance.

4.2 Analysis of questionnaires

4.2.1 Questionnaire results

After the experiment, based on the results of the two surveys done on the experimental and control groups, the results were quantified according to the previous regulations and the mean and standard deviation were calculated, and the results are shown in Table 3.

Table 3: The average of the experimental group was measured

			A	B	C	D	E	F	G	H
Experiment class	Pretest	M	74.3	70	90.2	55.9	57.2	73.1	72.8	73.4
		SD	13.5	15.3	7.5	20.6	15.2	12.9	14.5	15.9
	Posttest	M	80.4	72.3	92.2	55.6	60.6	75.8	77.2	74.8
		SD	11.2	14.8	6.5	23.8	15.4	14.0	15.2	14.9
Control class	Pretest	M	73.6	70.2	88.9	55.2	56.3	72.2	72.5	72.8
		SD	13.6	13.2	8.2	20.0	15.1	13.6	14.8	16.5
	Posttest	M	73.3	68.9	88.9	51.2	58.7	73.2	73.5	72.5
		SD	14.5	16.3	8.4	22.9	13.8	14.1	14.2	16.5

The data in the above table was analyzed and processed using SPSS software and the results are shown in Table 4.

Table 4: Pretest data

		A	B	C	D	E	F	G	H
Experiment class	M	74.3	70	90.2	55.9	57.2	73.1	72.8	73.4
	SD	13.5	15.3	7.5	20.6	15.2	12.9	14.5	15.9
Control class	M	73.6	70.2	88.9	55.2	56.3	72.2	72.5	72.8
	SD	13.6	13.2	8.2	20.0	15.1	13.6	14.8	16.5
Z value		0.45	0.52	0.77	0.46	0.68	0.87	0.22	0.41
P value		>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05

In terms of interest in learning, the results are shown in Table 5.

Table 5: Data processing in learning interest

The experimental group was compared						
	Pretest		Posttest		Z value	P value
	M	SD	M	SD		
Study interest	74.3	13.5	80.4	11.2	0.08	>0.05
Read books	70	15.3	72.3	14.8	0.05	>0.05
The experimental group, the control group after the comparison						
	Experimental group		Control group		Z value	P value
	M	SD	M	SD		
Study interest	80.4	11.2	73.3	14.5	5.23	<0.01
Read books	72.3	14.8	68.9	16.3	2.61	=0.02

In terms of motivation to learn, the results are shown in Table 6.

Table 6: Learning motivation

The experimental group was compared						
	Pretest		Posttest		Z value	P value
	M	SD	M	SD		
Study interest	90.2	7.5	92.2	6.5	4.1	<0.02
Read books	55.9	22.6	55.6	23.8	0.19	>0.05
The experimental group, the control group after the comparison						
	Experimental group		Control group		Z value	P value
	M	SD	M	SD		
Study interest	92.2	6.5	88.9	8.4	5.12	<0.01
Read books	55.2	20.0	51.2	22.9	1.94	>0.05

The results in terms of motivation and interest in learning are shown in Table 7.

Table 7: Learning motivation and learning interest

The experimental group was compared						
	Pretest		Posttest		Z value	P value
	M	SD	M	SD		
Study interest	57.2	15.2	60.6	15.4	2.22	<0.05
Read books	73.1	12.9	75.8	14.0	1.89	>0.05
The experimental group, the control group after the comparison						
	Experimental group		Control group		Z value	P value
	M	SD	M	SD		
Study interest	60.6	15.4	58.7	13.8	1.30	>0.05
Read books	75.8	14.0	73.2	14.1	1.87	>0.05

4.2.2 The effectiveness of computer-assisted individualized instruction in Civics

The findings showed that. After the experiment and before and after the experiment of the two groups of students, there is a significant difference in school interest ($P<0.01$), in reading books related to Civics and Political Science also produced a relatively significant change ($P<0.05$), indicating that computer-assisted personalized teaching can enhance students' interest in learning. The post-test questionnaire survey of the students in the experimental group also confirms this, 76.9% of the students think that they prefer computer-assisted Civics teaching, and 79.4% of the students think that computer-assisted personalized teaching can stimulate the learning interest of Civics, which is exactly what is usually discussed about the advantages of computer-assisted personalized teaching.

The survey results show that. After the experiment and before and after the experiment of the two groups of students, there was a significant change in learning the vision of Civics and Politics, and there was also a certain impact on the students' purpose of learning, and the students' interest in computer-assisted personalized teaching is relatively high, which may be due to a variety of reasons, either because the students are interested in the computers themselves; or because they are interested in the form of the delivery of computer-assisted personalized teaching. Or both. Through the teacher's guidance to gradually transfer the students' interest in computers or computer-assisted personalized instruction to their interest in learning the subject of Civics and Political Science, so that the students appreciate that Civics is a very interesting subject.

The two groups of students in the learning enthusiasm, learning mood produced certain differences ($P>0.05$), the experimental group of students before and after the test in the learning enthusiasm produced more significant differences ($P>0.05$). The questionnaire survey of the experimental group of students also confirms this, 80.8% of the students believe that the use of computer-assisted personalized teaching is more relaxed and happy. It shows that computer-assisted personalized teaching has a certain impact on learning motivation, learning mood, but the effect is not significant enough.

Pre-test when the two groups of students in the Civics learning achievement is basically equivalent, after a period of computer-assisted Civics teaching, post-test when the experimental group average score has a more significant increase, compared with the control group produced close to significant differences, indicating that computer-assisted personalized teaching can to a certain extent to improve learning achievement.

5 Conclusion

Through the experiments and data analysis of this study, the following conclusions can be drawn:

The computer-assisted personalized teaching model has a significant effect in improving students' academic performance in Civics. The improvement of the experimental group in the final grade is 10.06 points, while the control group is 3.85 points, the difference is significant ($P<0.05$).

Computer-assisted instruction can significantly enhance students' learning interest and motivation. The experimental group's learning interest increased from 74.3 to 80.4 points and learning motivation increased from 90.2 to 92.2 points, both of which were significantly different ($P<0.01$, $P<0.02$).

Computer-assisted personalized teaching can stimulate students' interest in the Civics and Political Science course, and 79.4% of the students said that personalized teaching enhanced their learning interest.

Although there were some differences between the experimental group and the control group in terms of learning motivation and emotion, the effect was not significant. Therefore, computer-assisted personalized teaching has greater application potential in Civics education, especially in enhancing students' learning performance and interest.

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