THE APPLICATION OF SMART CLASS WITH ARTIFICIAL INTELLIGENCE FOR LEARNING ACHIEVEMENT OF SITUATION AND POLICY COURSE OF YEAR 3 UNIVERSITY STUDENTS IN CHINA*

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Abstract

This mixed methods study compared year 3 university students' Situation and Policy course achievement before and after using Smart Class with AI and investigated their satisfaction towards the use of Smart Class with AI in Jiangxi Province, China. The sample group consisted of 20 junior students at Nanchang Institute of Technology, China. Quantitative and qualitative data were collected through four lesson plans, pre-test, post-test, questionnaire and focus group interview. Quantitative data were analyzed using means, standard deviations and paired sample t-test. Qualitative data were analyzed using thematic analysis. The data collection lasted for four weeks. The results of the pre-test and post-test showed that the students in the sample group significantly improved their learning achievement in Situation and Policy course. The questionnaire items were all rated in a high level, and most students were satisfied with this teaching method. This study demonstrated that the use of Smart Class with AI provided an alternative and effective method for Situation and Policy course.

Keywords: Application, Smart Class, AI, Situation and Policy

Introduction

With the rapid development of AI technology, the reform and development of education has also emerged, the China proposed education informatization in 2000 and released the "Education Informatization 2.0 Action Plan". Education is gradually changing from the traditional one-to-many teaching mode to personalized teaching, which means that education needs to better meet the learning needs of different students. Artificial intelligence, as a powerful tool, can provide teachers with precise teaching suggestions by analyzing students' learning behaviors, interests and abilities to help students better master knowledge.

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Situation and Policy course is an ideological and political theory course which is compulsory for all students in Chinese colleges and universities, and it has an important mission in the ideological and political education of college students, and is the main course to educate college students about Situation and Policy, which has an important role in guiding students to correctly recognize the international and domestic situation, and to correctly understand the guidelines and policies of the Party and the country.

From the perspective of the relationship and development between Smart Classrooms and Artificial Intelligence. In recent years, technological advancements have revolutionized the education sector, introducing innovative tools and methodologies to enhance the learning experience. One such development is the concept of Smart Classrooms, which leverage the power of Artificial Intelligence (AI) to transform traditional learning environments into interactive and dynamic spaces. The relationship between Smart Class and AI is symbiotic, as AI plays a crucial role in the development and effectiveness of Smart Classrooms.

Smart classrooms are equipped with digital whiteboards, projectors, tablets, and other devices that facilitate dynamic presentations and collaborative learning. Students can interact with multimedia content, access educational resources online, and participate in real-time assessments and feedback. AI-powered educational tools can analyze and process vast amounts of data to provide personalized learning experiences for each student. Adaptive learning platforms powered by AI can identify individual strengths and weaknesses, allowing teachers to customize their approach and provide targeted support to students who require additional assistance.

Smart Class and the AI in education have revolutionized the traditional teaching methods. This transformative combination of technology and education is reshaping the educational landscape, offering numerous benefits and novel possibilities. It encompasses a range of technological advancements that create an interactive learning environment. These classrooms are equipped with various digital tools which enable real-time collaboration, multimedia presentations and access to online educational resources. Smart Class facilitate engagement, interactivity, and personalized learning experiences, catering to diverse students needs and learning styles (Martin, 2019).

Therefore, this study aimed to explore the application of Smart Classroom with AI in improving the students' achievement in Situation and Policy course and their learning satisfaction. It was expected that this study would provide the useful references for innovative development in the field of education in China and other countries.

Objectives of this Research

1. To compare the learning achievement in Situation and Policy course before and after applying Smart Class with AI by year 3 university students in China.

2. To investigate year 3 university students' satisfaction towards the application of Smart Class with AI in Situation and Policy course in China.

Research Methodology

1. Research Design

In order for the research to be rational, scientific and ethical, this research was conducted using a combination of research methods, both quantitative and qualitative data collection processes. Through the empirical research and data processing, the empirical research was carried out with the actual teaching of college classrooms, and the teaching content of the Situation and Policy course using smart teaching was selected for research (Hartas, 2015). Quantitative and qualitative data were collected through four lesson plans, pre-test, post-test, questionnaire and focus group interview.

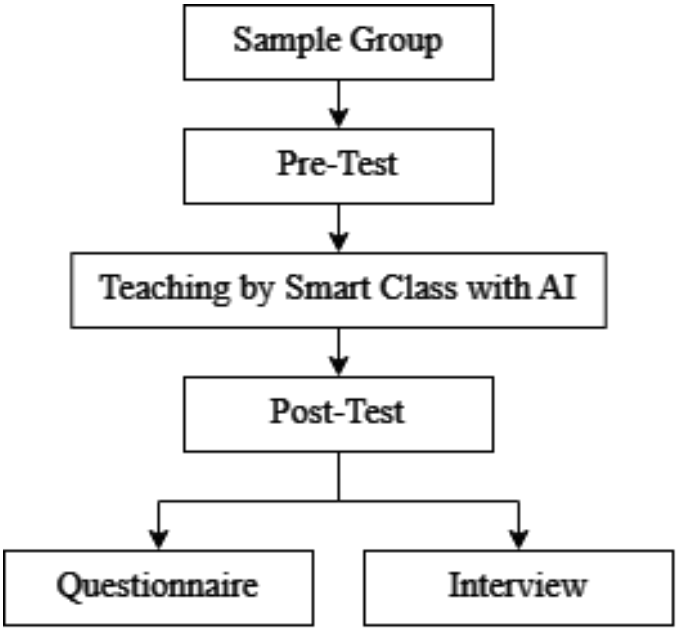

Figure 1 Flow of Research Design

2. Research Instruments

The selection of instruments in the research was based on the content of the study, and in order to better achieve the objectives of the study. This study included the research tools from the perspective of qualitative and quantitative analysis.

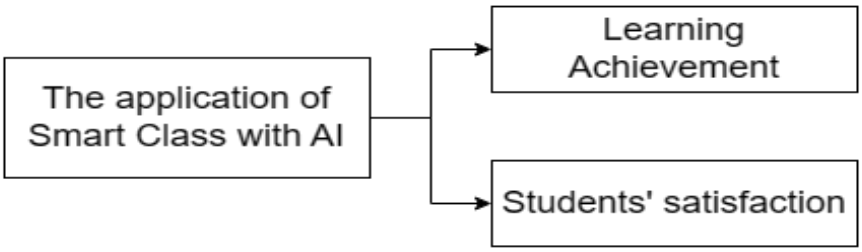

Figure 2 Relationship of variables

3. Lesson Plans

The research cycle of the course was designed to consist of four lessons, each consisting of two class periods totaling 90 minutes, and one lesson per week for four weeks. The researcher would apply Smart Class with AI in each lesson.

4. Achievement Test

The purpose of the exam in this study was to check the students' achievement in teaching the Situation and Policy course though applying Smart Clas with AI. Analyze the achievement results through pre-test and post-test.

5. Questionnaire

Investigating students' satisfaction towards the courses has always been a key component of teaching and learning, and in this research the satisfaction of students before and after taking a Situation and Policy course with the application of Smart Class with AI was explored through 5-point Likert scale questionnaire.

6. Validity and Reliability

here were various methods for testing validity of the research instruments. Apparently, in this research, the method of Item-Objective Congruence (IOC) was chosen in order to explore the survey between teaching effectiveness and the application of Smart Class with AI. By being validated by 3 experts in education, all research instruments were validated with the average score which was higher than 0.67, showing that all of these instruments were valid.

In addition, the reliability analysis in scientific research was a statistical method that assesses the consistency and dependability of data. In this research, the internal consistency (Cronbach's alpha) was used to evaluate different aspects of reliability of the questionnaire. The result of 0.93 demonstrated that the questionnaire items were reliable for the further use.

7. Population and Sample

The researcher chose a general higher education institution in China for the study. In order for the research to be persuasive and authentic as well as universally representative.

The participants of the study included 20 students, studying in year 3 at Nanchang Institute of Technology. This included 10 male and 10 female, aged between 19 and 21 years old. Twenty students made up a class which was a complete sample of study.

8. Data Collection Procedures

In order to carry out the research at the college, the researcher was obtained a letter of approval from Nanchang Institute of Technology. Since the participants in this study were all adults who were 18 years old and higher, this study only required obtaining consent from the participants themselves.

In order to ensure the security of information, all information regarding students' personal data and questionnaire responses were kept confidential in this research. At the end of the research, the researcher would delete all privacy-related data.

9. Data Analysis and results

In this study, two methods were selected for data collection and analysis. It corresponded to the objectives of the study: to explore the role of the application of Smart Class with AI in the Situation and Policy course for year 3 college students. The data from two pre-test and post-test were used to evaluate and analyze the individual student's learning achievement.

The students' learning satisfaction towards the application of Smart Class with AI was assessed through questionnaire and semi-structured interview. In short, these data were simpl used to analyze students' satisfaction towards the application of Smart Class with AI in the Situation and Policy course (Allen, 2007).

Research Results

1. Courese achievemrnt

According to the test scores, the results of the sample group were shown in Table 2, with a maximum score of 100 points. In terms of pre-test scores, the highest was 82, and the lowest was 45. After conducting Smart Class teaching with AI, participants achieved significantly higher scores in the Situation and Policy course, with the highest score 90 and the lowest score 61. The student who made the most progress achieved an improvement of 23 points. The results after the test showed that all 20 students made significant progress. The score test results showed the differences and score changes between the pre-test and post-test scores of each participant. The performance of the post-test was significantly higher than that of the pre-test. It can be seen that the scores of all students have improved.

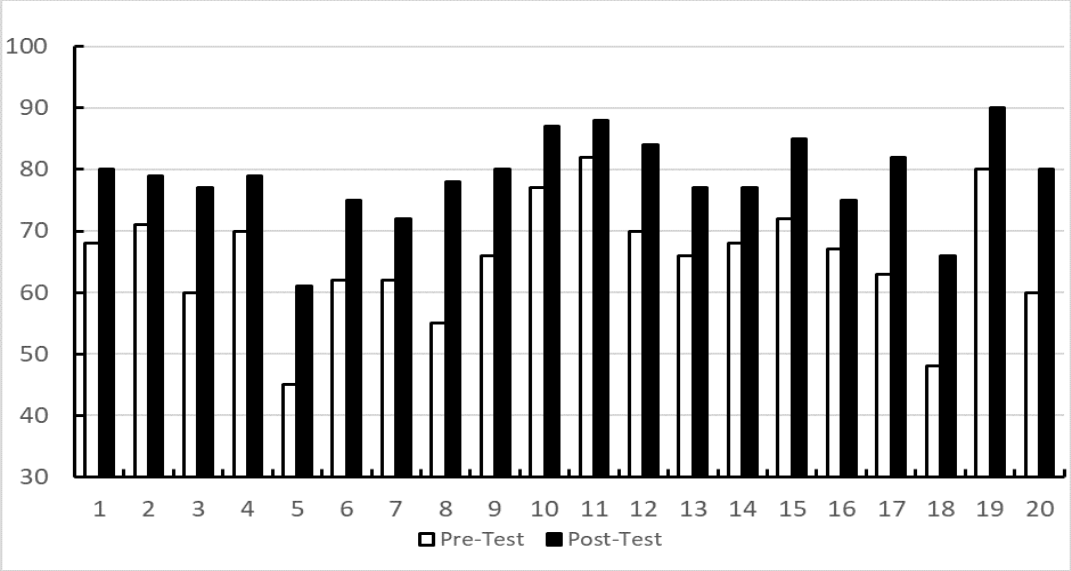

Figure 3 Pre-test and Post-test

By applying T-test analysis of the results of the two tests, the significance value between the pre-test mean score and the post-test one was .01. The average value of pre-test was 65.6 (SD=9.14); The average value of post-test was 78.6, (SD=6.80). The average difference between the two test results was 13, indicating that the overall score of the subsequent test results was relatively higher (Table 1).

Table 1 T-test Results

	N	Mean	S.D	t	Sig.
Pretest	20	65.6	9.14	5.10	0.000
Posttest	20	78.6	6.80		

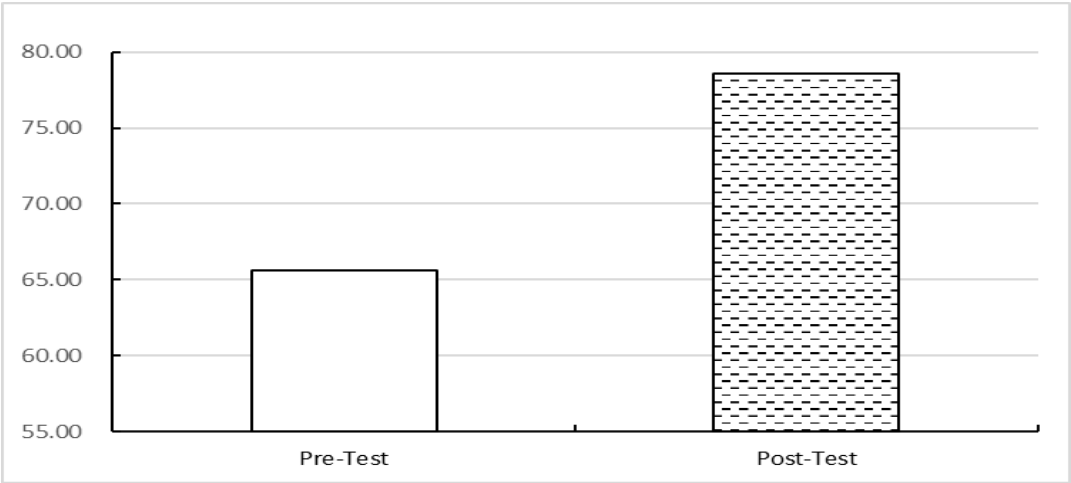

Figure 4 Average of Pre-test and Post-test

2. Satisfaction by Questionair

In this study, quantitative data were collected using a 5-point Likert scale to measure students' satisfaction towards the application of Smart Class with Artificial Intelligence, where 1 indicated a strong disagreement and 5 indicated a firm agreement. The questionnaire consisted of 15 questions, divided into three sections: Part A: Classroom Activity and Attendance, Part B: Course knowledge learning effectiveness and Part C: Self-perception and satisfaction. After the teaching, each of the 30 participants in a sample group received a copy of this questionnaire. The reliability test of the questionnaire was carried with 30 students who were not in a sample group by using Cronbach' Alpha analysis with the result of 0.93; showing that this questionnaire was reliable.

Table 2 below shows the mean scores and standard deviations of students' satisfaction of Part A: Classroom Activity and Attendance. Item 2, "I come to every class." achieved the highest score. This indicated that students had satisfaction towards the classroom and actively participated in each class.

Table 2 Part A

Part A: Classroom Activity and Attendance	**Mean**	**S.D.**	**Interpretation**
1. I'm active in the class	3.73	1.18	High
2. I come to every class	4.43	0.84	High
3. I participate well in class	3.97	1.05	High
4. Feeling better about the class atmosphere	3.80	0.98	High
5. I like the activities in class	3.80	0.95	High
Average	**3.95**	**1.00**	**High**

Based on the results of Part B: Course knowledge learning effectiveness, the means and standard deviations of the students' ratings were presented in Table 3 below. "The knowledge from this class was useful" (item 2) and "I can learn more knowledge through this" (item 3) achieved the highest score and the second highest score, respectively. This indicated that Students can perceive the knowledge they have learned in Smart Class with AI teaching mode.

Table 3 Part B

Part B: Course knowledge learning effectiveness	Mean	SD	Interpretation
1. I learned a lot knowledge in class	3.90	0.83	High
2. The knowledge from this class was useful	4.23	0.92	High

3. I can learn more knowledge through this	4.03	0.95	High
4. Learn and memorize directly in the class	3.80	1.17	High
5. It was easy to learn the knowledge	3.70	1.10	High
Average	**3.93**	**1**	**High**

Based on the results of Part C: Self-perception and satisfaction, the means and standard deviations of the students' ratings were presented in Table 4. Three items, “I'm very satisfied with the process of this course”, “I think I have learned a lot from this course” and “I will continue to study this course” achieved a very high-level score. This indicated that the Smart Class with AI teaching model played a very effective role in the Situation and Policy classroom, and they were highly satisfied with this teaching method.

Table 4 Part C

Part C: Self perception and satisfaction	Mean	SD	Interpretation
1. I'm very satisfied with the process of this course	4.10	1.01	High
2. I think I have learned a lot from this course	4.00	0.86	High
3. I will continue to study this course	4.13	1.12	High
4. I feel that this course was important to me	3.73	1.00	High
5. I think I'm a good fit for this class method	3.70	1.04	High
Average	**3.93**	**1.00**	**High**

3. Satisfaction by Interview

The purpose of this study was to provide an overview of the responses collected from focus group Interview regarding students’ satisfaction. The research used a thematic analysis technique to analyze the obtained data. The information collected in this way supplemented and supported the information collected through questionnaire.

The 20 participants involved in the research voluntarily participated the interviews after taking the course. The topic of the interview consisted of three parts: A: Classroom Activity and Attendance. B: Course knowledge learning effectiveness. C: Self-perception and satisfaction.

According to the students’ response, the teaching method of Smart Class with AI in Situation and Policy courses was considered effective. The students generally believed that information and intelligent teaching methods were both interesting and active. They said that in the teaching method of Smart Class with AI, they were less resistant and shy, and they preferred to explore the course knowledge after using these intelligent tools.

It was learned that the students raised many questions about the content of the Situation and Policy course, reasonably used Smart Class with AI to help themselves quickly acquire knowledge the content. They used the artificial intelligence tools to solve their own problems in the classroom. Teachers were able to easily collect questions raised by students during the course while utilizing Smart Class with AI. Therefore, Smart Class with AI appeared to be very effective on learning the course knowledge.

It was found that the students' feelings towards the traditional classrooms were relatively dull and boring. However, Smart Class with AI remarkably increased their interest in Situation and Policy classrooms. Most students enjoyed the intelligent teaching content such as tools for the artificial intelligence. Smart Class with AI enabled them to learn in the innovative ways with the new teaching methods.

Research Discussion

As mentioned above, two key findings were identified in the study. Firstly, the study found that year 3 students at the NanChang Institute of Technology improved their Situation and Policy course achievement by using the Smart Class with teaching model. The second finding was that year 3 students at the NanChang Institute of Technology showed positive satisfaction when using Smart Class with AI for Situation and Policy classroom learning. The students are satisfied with the application of this teaching method and have made positive evaluations.

1. Students’ Situation and Policy course Test Achievement

The research results indicated that using Smart Class with AI for Situation and Policy teaching can help improve students' course performance. Among Of the 20 students in this study, all scored above 60 on the Post-test, with 9 students scoring above 80. In terms of average scores, the Post-test scores (78.6) improved by 13 points compared to the Pre-test scores (65.6). The Post-test results were seen to be relatively favorable, implying that most of the students scored relatively well on the course exam. The type of questions used in the test were fill-in-the-blank and short-answer questions that were closely related to the curriculum, and the fact that students were able to achieve excellent scores on the test answer sheet indicates that the students who participated in the study were learning enough knowledge and content in the Situation and Policy class.

Specifically, The improvement of students' grades indicates that Smart Class with AI has a positive impact on students' classroom learning outcomes, and was further evidence of the effectiveness of Smart Class with AI. Therefore, the results of this study were consistent with the above results, providing us with the answer to the first research question.

2. Students' Satisfaction

A total of 20 participants (N=20) participated in the satisfaction survey in this study. The following conclusions can be made and these results provide us with the answer to the second research question.

1) The questionnaire rated all items at a 'high' level. There were not partially disagreeable items.

2) Based on the descriptive statistical analysis results of the questionnaire, this study concludes that students have a positive attitude towards using Smart Class with AI for learning Situation and Policy courses. In addition, none of the questions received a "strong opposition" response; This indicates that students were satisfied with teaching using Class with AI.

3) Students also unanimously believe that the teaching method of Class with AI can be applied to other subject areas.

Research Body of Knowledge

The body of knowledge identified from conducting this study is summarized in Figure 5, It displays the framework mode of Smart Class with AI teaching mode, and this study is based on this mode.

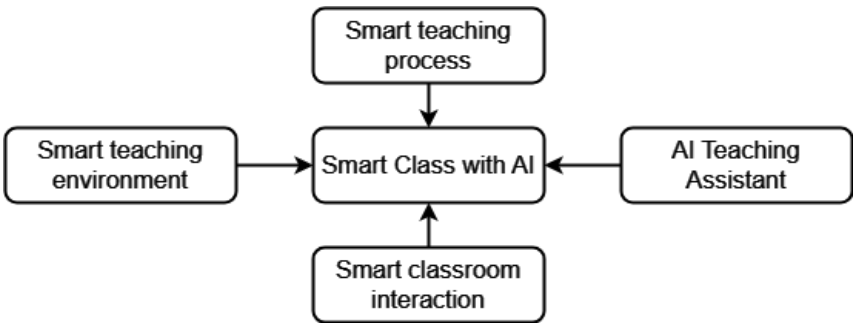

Figure 5 Knowledge framework

Research Suggestion

1. Suggestions in practice

1.1 The Smart Class with AI teaching model has been successfully applied to the Situation and Policy courses of the NanChang Institute of Technology year 3 students. Therefore, other universities can also benefit from using the Smart Class with AI teaching model for classroom teaching.

1.2 The idea of using the Smart Class with AI teaching model in teaching other subjects was considered a useful learning method and was therefore considered another way to teach other subjects.

1.3 There were many methods to apply the Smart Class with AI teaching model in teaching other disciplines. Because this intelligent teaching method can provide various assistance and personalized learning suggestions for students.

2. Suggestions for research

There were still some limitations in this study, and the researchers propose the following suggestions for further research.

2.1 Only twenty year 3 students from Nanchang Institute of Technology in China participated in this study. Therefore, comparisons conducted in other universities in China can provide meaningful research content and help validate and ensure the credibility of the results.

2.2 In this study, the duration of the course was limited, and the teaching cycle of one month which was relatively short. Therefore, in order to obtain more reliable results, it may necessary to conduct further research over a longer period of time.

2.3 The comparison between the teaching methods of Smart Class with AI and traditional classrooms was not sufficient, and further comparison can be made on the similarities and differences between the two, which helps to further explore classroom teaching models.

2.4 Teachers have relatively little exploration in the Smart Class with AI teaching mode, and can fully utilize teaching resources to further expand the advantages of this teaching mode.

2.5 The Smart Class with AI teaching mode can also be used to learn other subjects and skills, and can also be applied in other aspects of life.

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