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Application of Intelligent Information Technology in the Reform of Hybrid Teaching Courses in Colleges and Universities

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Abstract. With the rapid development of information technology and the deepening of teaching information reform, hybrid teaching is becoming the focus and development direction of current higher vocational education reform. By integrating network information technology into traditional classroom teaching, hybrid teaching overcomes the shortcomings of traditional classroom teaching, gives full play to the advantages of information technology, and improves the quality of teaching. According to the characteristics of Modern educational Information and Technology course in higher vocational colleges, this paper studies the teaching reform of online and offline Modern educational Information and Technology. 50 questionnaires were sent out and the results were analyzed.

Key words: Hybrid Teaching, Intelligent Information Technology, Curriculum Reform, Teaching Mode

1. Introduction

With the continuous progress of science and technology, information technology has become an indispensable part of our life. Intelligent information technology is the deep integration of politics, economy, culture, law, tourism, education, finance and other aspects of society, which makes earth shaking changes in all fields. It can be said that human life is inseparable from information technology. The development of information technology has led to the educational reform, which has given birth to new educational ideas and teaching models. The research on the integration of new information technology and ideological and political theory course meets the needs of the development of the times and the actual needs of education and teaching [1].

With the continuous progress of network technology, the reform of College mixed teaching curriculum based on information technology has attracted the attention of many experts. For example, some domestic teams have carried out the exploration and practical research on Blended Learning in Colleges and Universities under the information environment. By means of literature review and investigation, this paper introduces the definition, research status, theoretical basis and basic concepts of blended learning flipped classroom. Based on the existing research results of blended learning, according to the nature of the course and the types of knowledge points, a high-level learning system in the information environment is constructed, the teaching objectives and teaching contents are analyzed, and the design of course service system supporting students' learning is completed. According to the general mode, the concept of flipped classroom is put forward. Based on the analysis of the questionnaire survey on the students' use of blended learning mode, this paper analyzes the basic theory of blended teaching and the application status of blended learning at home and abroad, puts forward the concept of flipped classroom, and constructs the teaching design mode of blended learning by means of questionnaire survey, observation and interview. Through classroom teaching, network learning and other activities, this paper discusses the teaching process of mixed teaching, analyzes the implementation effect and existing problems of the course, and thinks that it is feasible to adopt the mixed teaching method in the course of laying equal emphasis on theory and practice in Colleges and universities. Some experts have studied the development status and guarantee system of Blended Teaching in Colleges and universities. On the basis of elaborating the related concepts and characteristics of blended teaching, this paper analyzes the unique educational value of Blended Teaching in the field of current education and teaching, and sorts out and analyzes the relevant problems in the development process of blended teaching, which provides practical basis and support for the construction of guarantee system and the promotion of the development of Blended Teaching in Colleges and universities. Through the construction of teaching management, organization system and incentive mechanism, the guarantee system of mixed teaching is enriched and improved. This paper studies the implementation process of blended learning in Colleges and universities, and solves the problems of overall planning and top-level design of blended learning. Through random lectures and random visits to teachers and students, we can objectively and comprehensively understand the teaching level and teaching effect of teachers, and establish a comprehensive security system linking training and service. Combined with the results of the questionnaire survey, this paper summarizes the implementation of blended teaching, points out the problems existing in the current mixed teaching, and analyzes and discusses their attribution [2]. Around the micro film, micro video production and case teaching, and the "flipped classroom" teaching reform based on MOOC, some experts have studied the main forms and effects of the application of information technology in the reform of Ideological and political courses in Colleges and universities, and fully integrated information technology into the curriculum system, teaching strategy, teaching mode, information management and sustainable evaluation guarantee mechanism. Through action research, we can deeply observe the actual effect of information technology in the ideological and political course in Colleges and universities, carry out the information-based teaching evaluation based on the actual effect, and construct the content, index system and performance incentive mechanism of information-based teaching performance evaluation. According to the key application of the existing teaching technology, this paper analyzes the main forms and practical effects of the application of information technology in the reform of Ideological and political courses in Colleges and universities, discusses how information technology participates in the process of teaching reform, the actual application situation and evaluates teachers and students, so as to better promote the two-way integration of information technology and ideological and Political Education Teaching [3]. Although there are a lot of research results on the reform of mixed teaching curriculum in Colleges and universities, there are still some deficiencies in the research of mixed teaching curriculum reform in Colleges and Universities under the background of information technology [4].

In this paper, in order to study the application of intelligent information technology in the reform of hybrid teaching course in Colleges and universities, the intelligent information technology is studied

and the calculation formula is found. The results show that the composite polymer teaching mode is an effective teaching mode.

2. Method

2.1. Intelligent Information Technology

In recent years, with the rapid development of mobile Internet and Internet of things, a high degree of integration of people, machines and things has been realized. " "Intelligence" refers to people's intellectual ability, that is, people's cognitive, memory, judgment, thinking, imagination and other capabilities. Intelligent information technology as a high-tech, human beings through intelligent information technology to transform the society, but also to the human society has brought risks. The cultivation of talents is based on the information literacy, which leads to the reconstruction of the information literacy of talents. As an educational tool, information technology not only promotes the structural transformation of education system, but also realizes the integration of technology and curriculum. Education system needs the development and promotion of information technology more and more. Information technology provides a new, modern and technical teaching environment, and a new perspective of teaching design for modern distance education. The use of electronic media breaks the limitations of existing teachers and classrooms. Through the establishment of a huge education resource database, students' learning ability is improved and the demand contradiction of education market is alleviated. Learning is not limited to the classroom, and students are encouraged to create and think in the learning process. Information technology promotes the reform of Higher Education Management: the rapid development of information technology makes higher education enter the information age, and quietly changes the management concept and management mode of colleges and universities [5]. Intelligent information technology is changing with each passing day. In terms of learning strategies, knowledge presentation and management methods have great innovation. Through the application of information technology in management, the management mode has been changed. Through the establishment of educational information circulation system and the publicity of educational evaluation results, the management quality of higher education has been improved. The advent of intelligent information technology era has created a good historical opportunity for the rapid development of semiconductor technology, but also brought severe challenges. Intelligent information technology must realize the green development of energy conservation and consumption reduction, and meet the needs of the times of global energy conservation and emission reduction. Energy saving technology must be sustainable development[6].

2.2. Calculation Formula

The core parameters of PCNN model include connection strength, β discrimination threshold s and α time attenuation constant. The initial setting of discrimination threshold s is realized by fuzzy c-means clustering algorithm and controlled by attenuation factor in each iteration [7]. The activity of each neuron can be obtained from the feedback input subsystem:

$$\begin{cases} F_{jk}(n) = S_{jk} \\ L_{jk}(n) = \sum W_{jk} Y_{jk}(n-1) \end{cases} \tag{1}$$

The input and output are input $F_{jk}(n)$ and S_{jk} output input weights $L_{jk}(n)$, where W is input and output. Thus, $Y_{jk}(n)$ the modulation connection layer can be calculated from the above parameters:

$$U_{jk}(n) = F_{jk}(n)(1 + \beta L_{jk}(n)) \tag{2}$$

The connection layer parameters are used as the input of the subsequent pulse generation layer for the result output [8]. Its pulse generation system and dynamic threshold system can be expressed as follows:

$$\begin{cases} Y_{jk}(n) = \varepsilon \lfloor U_{jk}(n) - S(n) \rfloor \\ S_{jk}(n) = e^{-\alpha} S_{jk}(n-1) \end{cases}$$

(3)

Where ε is the self setting constant and Y_{jk} is the output result. Through the iteration of S, different output results are generated, and finally the final change detection result is synthesized [9].

3. Experience

3.1. Extraction of Experimental Object

In order to ensure the rationality and effectiveness of the questionnaire survey results, this survey first selected some college teachers and students for a small-scale test. On the basis of investigation, the author discussed and adjusted it with experts. The questionnaire survey adopts the method of purposeful sampling and random sampling. In order to make the research more representative, typical and extensive, four universities were selected in the target area of the questionnaire survey, namely a university, B University, C University and D University. The survey basically considered the eastern, central and northern regions, including liberal arts and science colleges and universities at different levels. At the same time, in order to obtain a larger range of samples, we also conducted a network survey through questionnaire survey [10].

3.2. Experimental Design

Research interviews were conducted in the form of semi-structured interviews. Semi structured interview, that is, before the interview, the interviewer prepares the interview outline and grasps the overall direction of the interview. At the same time, it can be adjusted gradually according to the progress of the interview. The interview mainly focuses on the problems, doubts, problems and reasons encountered in the process of mixed teaching in Colleges and universities, as well as the relevant measures actively explored and adopted by colleges and universities to promote the development of mixed teaching. Through interviews with some teachers, education administrators and university leaders, this study has a comprehensive and clear understanding of the current situation and difficulties of blended teaching development, and also provides many useful suggestions for colleges and universities to promote the development of blended teaching. The questionnaire includes three aspects: first, the application status and effect of teaching mode in Colleges and universities. This part is divided into one theme, namely, the main teaching mode accepted by students and its learning effect and satisfaction under the mode; the second theme is the implementation status of mixed teaching. The cognitive and emotional attitudes of students and teachers to blended teaching were investigated. There are three themes of students' cognition and emotional attitude towards blended teaching, including five themes in the cognitive part, which mainly involve students' understanding, advantages and learning effect of blended teaching; the six themes of emotional part mainly involve students' interest, participation and support for blended teaching. There are 11 themes about teachers' cognition and emotional attitude towards blended teaching. The cognitive part is divided into five themes, mainly involving teachers' overall understanding of blended teaching, its positive and negative effects and the future development trend. The emotional part of the two topics mainly involves the teachers' attitude towards blended teaching; thirdly, the implementation of the mixed teaching security system. This part is divided into seven topics, respectively from the training assessment, incentive measures, evaluation management and resource support to understand the overall situation of hybrid teaching security system [11].

4. Discussion

4.1. The Management and Evaluation System of the Course

In the whole teaching process, we also pay more attention to the use of the platform. Through MOOC platform, we have refined the teaching content and the problems concerned in the daily life of college students, and conducted in-depth research and discussion, and achieved more extensive education effect. For example, opening a special column on students' letters at the beginning of the semester to answer students' life problems with professional knowledge can increase the closeness of the course and shorten students' learning willingness; in the teaching process, the special topic teaching discussion column, as an auxiliary part of classroom teaching, reflects and understands the connotation of knowledge in the discussion. By setting the essence of the course content, teachers can use the classic cases, papers and other materials related to the course as auxiliary learning resources to attract students' attention. Secondly, MOOC provides courseware and lesson plan download, homework feedback query, which provides great convenience for teachers and students to read high-value books and materials. The theory course m00c in University also makes students have strong flexibility in the design and evaluation of teaching content. Through the online and offline multiple evaluation forms, students get 4-67% of the score of each item. These scores together constitute the final score of the course, weakening the final examination and strengthening the usual. As shown in Table 1.

Table 1. Mixed teaching mode and assessment method

Examples before class	5
Research Report	8
Reading Report	15
Online testing	23
Small class discussion	25
Course paper	10
Course summary	14

As can be seen from the above, Research Report accounts for 8 points, reading report accounts for 15 points, reading report accounts for 7 points more than Research Report; online test accounts for 23 points, small class discussion accounts for 25 points, small class discussion accounts for 2 points more than online test.

4.2. Analysis of the Survey Results of Blended Learning

At the end of the course, we observed and recorded the classroom with the students and the communication with the learners. We have a preliminary understanding that most learners hold a positive attitude towards blended teaching, but there are still a few learners who are deeply influenced by "cramming teaching" and are used to the learning methods taught by teachers in the classroom. They can not change their thinking in time and adapt to the mixed learning mode in the information environment. Therefore, it needs the participation, cooperation and guidance of teachers and teaching assistants. Finally, through the questionnaire survey, we can further understand the learners' satisfaction with blended teaching and the transformation and improvement of learners' ability by blended teaching. As shown in Figure 1.
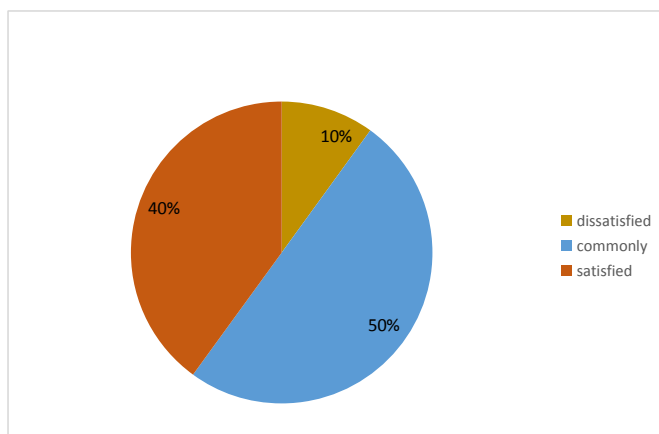
Figure 1. Student satisfaction with blended learning

As can be seen from the above figure, the analysis of the survey results: according to the questionnaire survey at the later stage, 40% (20) of the students thought that they were satisfied, 50% (25) of them thought that they were average, and 10% (5) of them were not satisfied with the development of blended teaching. Generally speaking, most of the learners support the development of blended teaching.

4.3. Differences of College Teachers of Different Ages

Independent sample P test can only be used to test whether there is significant difference in the mean value of the same variable between the two groups. One way ANOVA was used to test whether there was significant difference in cognition of variables among teachers of different ages. As shown in Table 2.

Table 2. One way ANOVA of Teachers

	Sum of squares	mean square	Significance
Between groups	0.213	0.788	0.743
Within group	0.725	0.125	0.983
total	0.732	0.732	0.736

It can be seen from table 2 that the significance level of the sum of squares, mean square and significance among groups is less than 0.8, indicating that teachers of different ages have significant differences in the above variables.

There was no significant difference in these variables among teachers of different ages. In order to further explore the differences among teachers of different ages on the three variables of sum of squares, mean square and significance, multiple intra group comparative analysis is needed. As shown in Figure 2.
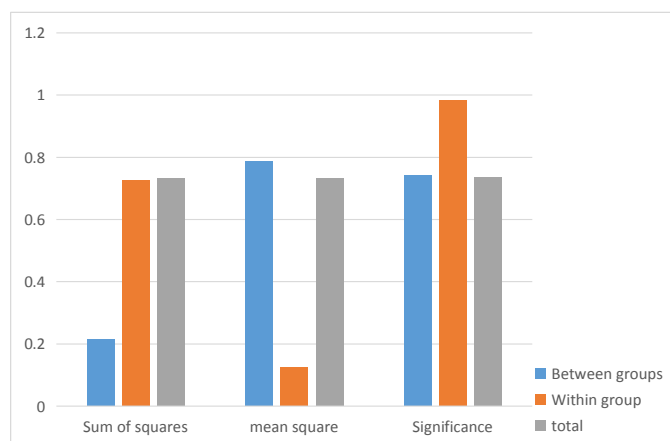
Figure 2. One way ANOVA of Teachers

As can be seen from the above figure, the significance within the group was 0.983, the mean square between groups was 0.788, and the sum of squares of the total was 0.732.

5. Conclusion

In recent years, with the rapid development of wireless Internet technology, smart phones, tablet computers and various smart mobile devices have been widely used among teenagers, and the way students acquire knowledge and information is also quietly changing. The traditional single book classroom teaching mode has gradually not adapted to the development of the times. This paper discusses the important role of diversification in teaching. A variety of mixed teaching modes are adopted in higher vocational courses. This paper introduces the selection of teaching content, the establishment of teaching mode, the construction of practical conditions, the development of hierarchical teaching, the combination of learning achievement evaluation and MOOC. On the basis of information technology, the network teaching environment of polymer course is constructed, which effectively combines classroom teaching with network teaching. This combination mode has been practiced in polymer teaching practice. The results show that the composite polymer teaching mode is an effective teaching mode.

Acknowledgments

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