Mixed Teaching Reform of Computer Major Courses Under the Background of Intelligent Teaching

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Abstract: Conventional teaching reform methods focus on teaching quality, and the implementation of teaching reform did not combine the characteristics of professional courses, resulting in poor teaching reform results. Therefore, under the background of intelligent teaching, this paper studies the mixed teaching reform of computer courses. Based on the background of intelligent teaching, the mixed teaching system of computer professional courses is constructed, and the mixed application level of intelligent teaching is improved from multiple perspectives, so as to realize the efficient reform of computer professional courses. Through the analysis of examples, it is verified that the teaching quality of the reform method is better and can be applied in real life.

1 INTRODUCTION

Under the background of the extensive application of information technology, computer courses have become the key training majors in colleges and universities, which play an important role in the cultivation of students' employability in the future (Yue Liu, 2021). The courses of computer specialty include computer application, graphic design, digital media technology, network technology, etc (Chen X., 2022). Computer professional courses and teaching models are independent of each other, and can be expressed as teaching content. When organized, it is a complete and achievable teaching.In the process of computer teaching, the ultimate goal is to cultivate high-quality professionals. According to the actual situation of students, school running characteristics and teachers' teaching ability, the teaching effect of computer professional courses can be improved in a real sense (Wang D, 2021). Therefore, under the background of intelligent teaching, this paper designs a mixed teaching reform method for computer courses.

2 DESIGN OF MIXED TEACHING REFORM METHOD FOR COMPUTER COURSES BASED ON INTELLIGENT TEACHING BACKGROUND

2.1 Building a Hybrid Teaching System for Computer Courses Based on Intelligent Teaching Background

In the process of teaching reform, students can learn at their own pace and choose the learning content they are interested in. And professional learning of computer courses is carried out in the form of active learning (Wan Z, 2021). In this process, there is a high requirement for teachers. Teachers control the whole classroom, with only one purpose, that is, the transmission of curriculum information. In the context of intelligent teaching, this paper divides the application levels of intelligent education, as shown in Figure 1.

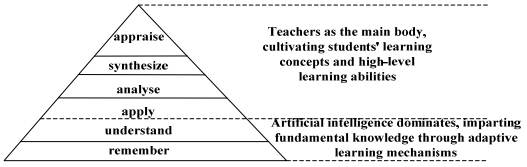

Figure 1: Intelligent Education Application Hierarchy.

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As shown in Figure 1, this paper divides the mixed application level of intelligent teaching into evaluation, synthesis, analysis, application, understanding, memory and other parts. Cultivate students' comprehensive knowledge ability in two aspects: teacher dominated and machine dominated.In the teaching reform process designed in this paper, teachers and students serve as the subject and object of teaching. The teaching process is dominated by artificial intelligence. Through human-computer interaction, teachers can implement teaching with more abundant energy. In the context of intelligent teaching, the content of computer courses also needs to be constantly changed, combining online course content with offline course content, forming a "connecting line" between the two, each connection has a weight value, and by adjusting the weight value, the whole online+offline teaching environment will be better. In this paper, x represents the input data of online courses, and y_i represents the output data, then:

$$y_i = \sum_{i=1}^{m} w_i x^i - \alpha \tag{1}$$

In formula (1), y_i is the output data of online courses; w_i is the weight value; x^i is the ith input data; α is the threshold. This article will α as an input weight 0 of the online course input neuron, the online output process is simplified as:

$$y_i' = \sum_{i=1}^{m} w_i x^i \tag{2}$$

In formula (2), y_i' output data for simplified online courses. After the contents of online courses and offline courses are transmitted through the network, the nonlinear factors in the courses can be improved, which can change the problem of insufficient expression ability in teaching reform. In order to make the advantages of the mixed teaching mode more obvious, this paper uses the transfer function to map the advantages of the mixed teaching reform. The formula is as follows:

$$f(x) = g(y_i') \tag{3}$$

In equation (3), $f(x)$ is the transfer function; $g(y_i')$ maps the advantages of mixed teaching reform. As the teaching reform of computer courses is more extensive, the gradient loss is more obvious in the course implementation, and the reform path cannot be determined. In order to reduce the value of the loss function in the reform system, this paper reduces the direction vector of the hybrid teaching mode, and the formula is as follows:

$$\nabla f(x)\Delta x^i = \left\|\nabla f(x)\right\| * \left\|\Delta x^i\right\| * \cos(\nabla f(x), \Delta x^i) \tag{4}$$

In equation (4), $\nabla f(x)$ is the gradient direction; Δx^i is the step scalar of the input data. When $\nabla f(x)\Delta x^i$ minimum, $\nabla f(x)$ and Δx^i on the contrary, at this time, the value of the loss function will decrease, and the fixed learning rate in the course will also increase, thus ensuring the improvement effect of the whole hybrid teaching. After intelligent optimization, this paper analyzes the advantages of instructional design in the context of intelligent teaching, as shown in Table 1.

Table 1: Advantages of teaching design in the context of intelligent teaching.

The Application Forms of Intelligent Teaching	Elements of instructional design	classification	superiority
Subjective application form	Teachers (changes in teaching subject and object)	Active learning and Adaptive Learning System	Implementing personalized teaching teach students in accordance with their aptitude
	Students (changes in teaching subject and object)	Intelligent teaching mode created by teacher teaching groups	
	Student Companion (Changes in Teaching Subjects and Objects)	Personalized Course Recommendation System for Degree Compass	
	Teaching assistant (changes in teaching subject and object)	Artificial Intelligence Chat Robot Teaching Assistant	Personalized services to improve the teaching efficiency of computer related courses
Auxiliary application form	Teaching aids (teaching evaluation)	Course Signal Project for Computer Majors	Real time tracking and feedback of students' learning situation, viewing their learning problems, and using scale level statistical data as teaching evaluation indicators
		Electronic Archive Tools for Course Majors	
		Electronic course resource tools eCART	
	Teaching Context (Environmental Elements)	AltSchool's Learning Space	Virtual reality scene, intelligently tracking students' computer learning behavior, providing students with an immersive learning environment
		Open Science Laboratory	

As shown in Table 1, this paper integrates the AI teaching system in the intelligent teaching environment to change the traditional teaching mode. Students can form an efficient online and offline learning environment through personalized learning services, and achieve personalized and accurate education services through the construction of online+offline integrated teaching reform. In the context of intelligent teaching, in the process of mixed teaching reform of computer professional courses, not only the course contents need to be linked and interacted with each other, but also the mixed teaching model needs to be formed into a

highly cooperative course structure, so as to highlight the advantages of the course reform.

3 EXAMPLE ANALYSIS

3.1 College Profile

In order to verify whether the hybrid teaching reform method designed in this paper has reform strength, this paper takes C University as an example to analyze the above methods. College C is one of the first batch of national key colleges and universities. In terms of teaching reform, it has always been a model college in the province and city, and an advanced unit of national college education. At present, College C has four departments, including information technology, finance and commerce, public foundation, culture and art, with a total of 240 teachers and 210 full-time teachers. Among them, there are 45 full-time teachers with graduate degrees, and 95% of them have bachelor's degrees or above. Computer courses have always been an important achievement of College C, and are subordinate to the Department of Information Technology, including computer applications, computer graphic design, computer animation, and game making. The total number of students in this category exceeds 800, including 6 professional teachers, 4 professional full-time teachers, and 2 external teachers. Therefore, the computer professional courses of College C have become the key majors in the city.

3.2 Application Results

Under the above conditions, this paper randomly selected three primary indicators, namely knowledge and skills, process methods, and emotional attitudes, and refined them into secondary indicators, such as knowledge accumulation, system construction, language expression, independent thinking, problem discussion, communication and cooperation, task submission, learning interest, cooperative attitude, and innovation awareness. In the environment of consistent teaching content evaluation conditions, the final score of students is determined by group self-evaluation and teacher evaluation to verify whether the teaching reform method designed in this paper has practical effects.The application results are shown in Table 2.

Table 2: Application Results.

evaluating indicator		Evaluation of teaching content	Evaluation score		
Primary indicators	Secondary indicators		Group self-assessment score	Group teacher evaluation score	Student actual score
Knowledge and skills	Knowledge accumulation	Understand and proficiently apply C programming	8	7	7
	System construction	Able to connect basic knowledge with practical tasks and independently construct a knowledge system	10	11	11
	Language expression	Fluent language expression, clear speech, and clear problem expression	6	6	6
Process Method	think things out for oneself	Independently think about problem-solving methods, search for information, and form your own problem-solving ideas	11	12	12
	Problem Discussion	Proactively discuss problems with various members of the group and make improvements to their problem-solving methods	10	10	10
	Communication and cooperation	Proactively express one's own opinions, listen attentively to others' opinions, and cooperate with team members in a tacit manner	10	10	10
	Task Submission	The team submits task code and DOS screenshots as required	6	5	5
Emotional attitude	learning interest	Interested in learning C programming	8	9	9
	Cooperative attitude	Having a spirit of mutual assistance and unity in the group	12	12	12
	Innovation awareness	Having an innovative mindset and utilizing it	9	9	9

As shown in Table 2, knowledge and skills account for 26% of the total score, process methods account for 42% of the total score, and emotional attitudes account for 32% of the total score. Knowledge accumulation, system construction, language expression and other secondary indicators were 8 points, 12 points and 6 points respectively; The secondary indicators such as independent thinking, problem discussion, communication and cooperation, and task submission are 12 points, 12 points, 12 points, and 6 points respectively; The secondary indicators such as learning interest, cooperation attitude and innovation awareness are 10 points, 12 points and 10 points respectively. After using the teaching reform method designed in this paper, students' scores in knowledge and skills are 24 points; The score of process method is 37; The score of emotional attitude is 30. Therefore, the total score of the student in "C programming" is 91 points, about 20 points higher than before. This proves that after using the teaching reform method designed in this paper, students' learning ability can be improved, which is consistent with the purpose of this study.

4 CONCLUSION

In recent years, the number of college graduates has

increased, and students' employment ability and qualifications are weak. The phenomenon of "unemployment upon graduation" is becoming increasingly serious. Under the background of knowledge economy, information technology, as a new technology, appears in the professional courses of colleges and universities, and has become a school running feature of colleges and universities. Bound by traditional ideas, the employment direction of students after graduation is small, and it is difficult to improve the employment quality. The employment scope of computer professional courses is wide, and the employment environment is complex. It is difficult for college students to find suitable jobs after graduation, but they are unwilling to hurt themselves, leading to a decrease in the employment rate. In order to better cultivate students' employability, it is necessary to reform the curriculum specialty. This paper mainly designs a mixed teaching reform method for computer courses under the background of intelligent teaching. From the two aspects of the importance of teaching reform and teaching system, professional courses will be improved to provide security for students' career.

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