



# Integrating Information Technology into the Teaching of Environmental Design Majors

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## Abstract:

With the advent of the information age, environmental design education in colleges and universities should also meet the objective needs of social development, and constantly seek teaching models and talent training methods that adapt to market development, so that environmental design education in my country tends to be perfect. Compared with the traditional teaching mode, the application of multimedia and network teaching platforms has brought about great changes in teaching methods, and the development of these information technologies has provided great convenience to education. Based on the research on integrating information technology into the teaching of environmental design professional courses, this paper investigates the application of information technology teaching by teachers of this major in a university through interviews. In the teaching practice of the teaching mode, it is found that the students who use the information-based teaching method have higher abilities than those who use the traditional teaching method. Interviews with the students who have adopted the information-based teaching method show that most of the students also show that the information-based teaching method is helpful to improve learning enthusiasm and design ability. To sum up, the integration of information technology into teaching can promote learning and maximize the use of teaching resources.

**Keywords:** *Information Technology, Environmental Design Major, Traditional Teaching, Information Teaching*

## 1 INTRODUCTION

The development of information technology has not only changed daily life, but also brought about major changes in the education and teaching environment. The use of information-based teaching methods in the teaching process affects all aspects of education, such as educational concepts, classroom teaching environments, teachers' teaching modes, and students' learning methods. The integration of information technology and environmental design professional courses is an extremely effective form to improve the education level of environmental design and cultivate design talents.

At present, the research on the integration of information technology into the teaching of environmental design professional courses has achieved good results, and the information teaching has both its advantages and its shortcomings. For example, the combination of Internet information technology and multimedia technology provides the possibility for modern network teaching. In this interactive teaching

environment, students can freely choose the learning content that suits them according to their own personality preferences and learning background, and can also choose different learning modes according to their own learning foundation. In this kind of online learning, in addition to enjoying various teaching resources, students can also help each other and conduct group learning. At the same time, by using network remote assistance, students can also communicate with teachers about learning problems on the network [1] [2]. The study found that in the process of integrating information technology and teaching methods, there were also some problems that needed to be optimized. Some teachers rely too much on the PPT projection courseware. During the whole class, they hardly move a chalk to write a word on the blackboard. However, the environmental design focuses on the design process. If the teacher has been focusing on PPT explanations and no demonstration of the design process, it is impossible to timely and effectively. Let students watch the teacher's on-site design process in real time [3]. Although the use of information technology in course teaching should be

favored by students and teachers, it is necessary to avoid excessive reliance on information technology in the teaching and learning process.

This paper first introduces several teaching methods of information technology, such as multimedia teaching and network teaching, and then conducts a practical study on the integration of information technology into the teaching of environmental professional courses. The teaching results and satisfaction after the teaching method illustrate the promoting effect of information technology on the improvement of students' ability.

## 2 INFORMATION TEACHING MODE

### 2.1 Information Technology Teaching Methods

#### 2.2.1 Multimedia-Assisted Teaching

Psychological studies have shown that students' learning cognition is regular, and learners can achieve the best results by using multi-sensory participation in the learning process to the greatest extent. Therefore, in the process of environmental design teaching, the selection and use of multimedia should be appropriate, and special attention should be paid to the degree of cooperation between teaching content and multimedia [4].

#### 2.2.2 Online Teaching

According to the research results at home and abroad, the network teaching mode is developed around the operation procedures, rules and methods of a certain teaching topic. Due to the complexity of the network teaching mode, it cannot be unified into one mode, and the network teaching mode can be divided into two sub-types: resource-based teaching activities and blended teaching activities [5]. Resource-based teaching activities are based on the rich resources of the Internet. In the teaching process, teachers guide students to use various resources to learn. In this teaching activity, the teacher first provides a learning topic related to the content of the class before the class, and clarifies the specific goal that students need to collect information. After the students obtain the goal, they start to collect information, and carry out the information according to the logic of setting knowledge. Structured processing and organization. Then, students analyze and summarize the collected information in groups and form answers within the group. Finally, at the beginning of the class, the teacher asks each group to present the collected materials and analysis conclusions, evaluate and summarize them [6] [7].

#### 2.2.3 Teaching "Cloud Course"

"Cloud course" is a new learning model recently proposed by some scholars. "Cloud course" is a platform and method that integrates various ideas and technologies

such as educational technology concepts, learning support services, and innovative thinking concepts to provide users with high-quality educational services" [8], instant messaging, Weibo, mobile phones, mobile terminals and other new shared media to build a shared service platform for cloud course consumers. In this platform, the needs of course learners and course resources are integrated into the platform, which makes various It is an innovative curriculum that can directly and effectively meet the individual needs of learners, which is beneficial to curriculum construction and development [9].

### 2.2 Data Mining

Data mining is the process of sifting out effective information from massive and complicated information. This paper can use this data mining technology to mine the statistics of teachers' use of information technology for teaching and students' satisfaction with the information teaching method.

Data mining algorithms include decision tree algorithm, association rule algorithm, Bayesian network, etc. This article introduces association rule algorithm, which can be used to analyze the correlation between information-based teaching methods and students' ability improvement and performance improvement.

$$\text{Support}(M \rightarrow N) = P(M \cup N) \quad (1)$$

$$\text{Confidence}(M \rightarrow N) = P(N | M) \quad (2)$$

Among them, Support represents the association support degree, Confidence represents the association confidence degree, A and B represent the transaction, and P is the probability.

### 2.3 Design of Curriculum Model for Environmental Majors Based on Information Technology

In the context of information education, we can divide the environmental design professional course model into two modules, one is landscape design based on 3D modeling software, and the other is interior design based on multimedia classrooms.

When teaching a landscape design course based on 3D modeling software, students enter the computer room and watch the teacher's design process under the guidance of the teacher. After the 3D landscape drawings are generated, the drawings need to be optimized. At this time, Photoshop software can be used to beautify the design. When teaching multimedia interior design courses, virtual glasses can be provided for each student if conditions permit. Through screen projection technology and VR glasses, students feel like they are in a real indoor space environment.

### 3 EXPERIMENTAL STUDY

#### 3.1 Research Content and Methods

This paper takes all the teachers and students of the environmental design major in a university as the research object, mainly through interviews and surveys, to investigate the current situation of teachers in this major using information technology in teaching, and to understand the ability of teachers in this school to use information technology. Then the students of this major are divided into two groups. Group A adopts information-based teaching, such as using multimedia, online courses, etc., and Group B adopts traditional teaching methods, that is, blackboard writing teaching. After one semester of teaching, compare the two Group students' learning attitudes, skills improvement, etc., and then through interviews with group A students' satisfaction with informatization teaching, to understand students' attitudes toward informatization teaching.

#### 3.2 Research Innovation Points

In order to facilitate the research on the teaching effectiveness of the school's information technology integration into the environmental design major, this paper divides the students of this major into two groups, adopts two different teaching methods, and the four-dimensional teaching achievements of the two groups of students under different teaching methods are analyzed through the obvious bodhisattva.

#### 3.3 Significant Statistics

The t test can be used to detect whether there is a significant difference between two groups of samples. This paper is used to test the differences in the ability improvement of the two groups of students who use information technology teaching and traditional teaching methods.

Independent sample test:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \left( \frac{1}{n_1} + \frac{1}{n_2} \right)}} \quad (3)$$

Paired sample test:

$$t = \frac{\bar{X} - \mu}{\frac{\sigma_x}{\sqrt{n}}} \quad (4)$$

$\bar{X}$  is the sample mean,  $\mu$  is the population mean,  $S_i^2$  is the sample variance,  $\sigma_x$  is the sample standard deviation,  $n$  is the sample size, and 1 and 2 represent sample 1 and sample 2.

### 4 ANALYSIS OF RESEARCH RESULTS

#### 4.1 Research Content and Methods

To understand the application of information technology into teaching activities by the professional teachers. The results are shown in Figure 1. It is found that 23.1% of teachers still use the traditional teaching media of "blackboard and chalk" in the teaching process, and 37.3% of teachers use conventional information tools such as ppt presentations to assist the presentation of teaching content., 26.5% of teachers use the online classroom media environment for teaching work, 8.6% of teachers use interactive electronic whiteboards or theme software (Moodle) to teach in the teaching process, and 4.5% of teachers use other methods for teaching. Through further interviews, it can be found that the timing and use of information technology into teaching are not only related to teachers' teaching content, but also closely related to teachers' choice of teaching strategies.

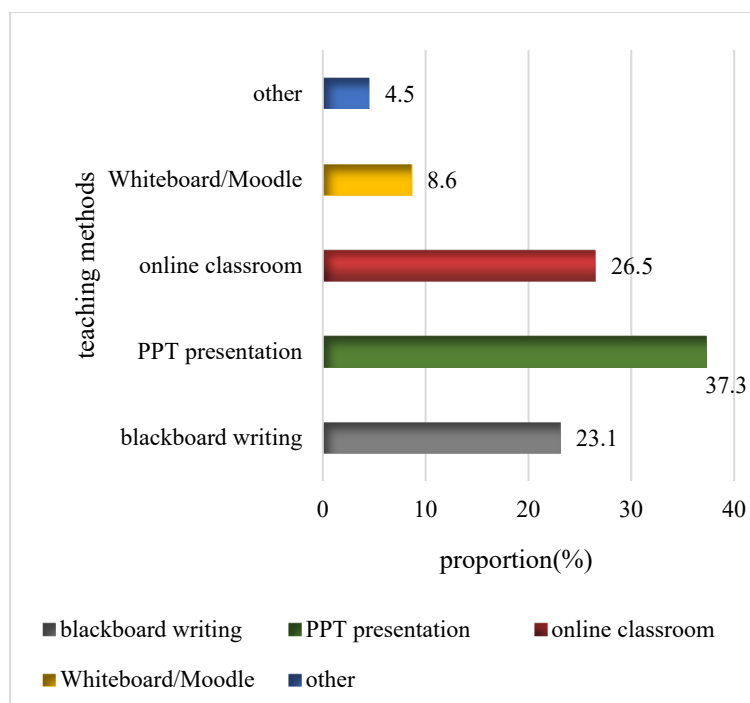


Figure 1: The use of information technology for teachers

Information-based education software resources refer to software resources that serve education and teaching. Its sources can be roughly divided into two categories. The first category refers to those designed and developed by specialized personnel for educational purposes, such as various multimedia courseware and some professional teaching software resources, another refers to those software resources that were not originally designed and developed for educational purposes, but were used by education and teaching because of their own educational value, such as the Internet various information systems, etc. Compared with traditional educational resources, the current rich information-based educational resources have the advantages of large amount of information, freedom of access, and convenient updating and sharing. They can serve education and teaching well. Although the current information-based education software resources have so many advantages, their disadvantages are undeniable. For example, the school spends a lot of money to purchase various resources. At the same time, the use of ready-made, general-purpose information-based teaching Software resources have put forward higher requirements for teachers' own information literacy, and they also need to invest a lot of energy and time.

In the survey of the interviewed teachers, it was found that when using multimedia materials and teaching software in the daily teaching process, less than one third

of the teachers said that they could successfully find the relevant information-based education software resources, and basically half of the teachers. It is said that in the process of daily work, it is difficult to find information-based educational software resources related to their teaching work. In particular, there are very few professional technical resources developed for the design of ring design drawings, and ordinary software resources cannot well express the essence of the course, and it is difficult to express the design process.

#### 4.2 Teaching Achievement Comparison

As shown in Table 1, comparing the learning attitude, problem-solving ability, self-learning ability, and teamwork ability of group A and group B, it can be seen from the mean that group A has the same ability in all dimensions compared with group B. However, in terms of learning attitude, the P value of the two groups was 0.073, which was greater than 0.05, indicating that there was no significant difference between the two groups in terms of learning attitude, while the P values of the other three dimensions were all less than 0.05, indicating that the two groups of students were in this. There are significant differences in the three dimensions. That is to say, group A adopts the information-based teaching method to improve the students' abilities in these three dimensions.

Table 1: Comparison of each dimension between the two groups

	Group A	Group B	t	P
learning attitude	22.52±3.46	20.37±3.61	-1.94	0.073
problem solving skills	20.84±1.72	17.95±1.64	-3.65	0.001
self-learning ability	21.19±2.35	19.43±2.26	-4.42	0.004
team work	27.76±2.58	25.60±2.38	-3.13	0.008

### 4.3 Student Satisfaction Survey

The students in group A were interviewed to investigate their satisfaction with the use of information technology in teaching. There were four interviews. One was that information-based teaching mobilized learning enthusiasm and initiative, and the other was that information-based teaching helped improve interpersonal relationships. Communication and common ability, the third is that information-based teaching helps to deeply understand the course content and improve the design skills, and the fourth is the satisfaction with the online

courses. The results of the statistical data are shown in Figure 2. Most of the students believed that the information-based teaching method mobilized the enthusiasm and initiative of learning, helped students to understand the content of what they were learning, and improved their interpersonal communication skills. However, the satisfaction with the provided online courses and other informatization resources is low. The reasons may be that the update speed of online course resources is slow, the students in the discussion area cannot get timely responses from teachers after posting, and sometimes the network speed is slow, etc.

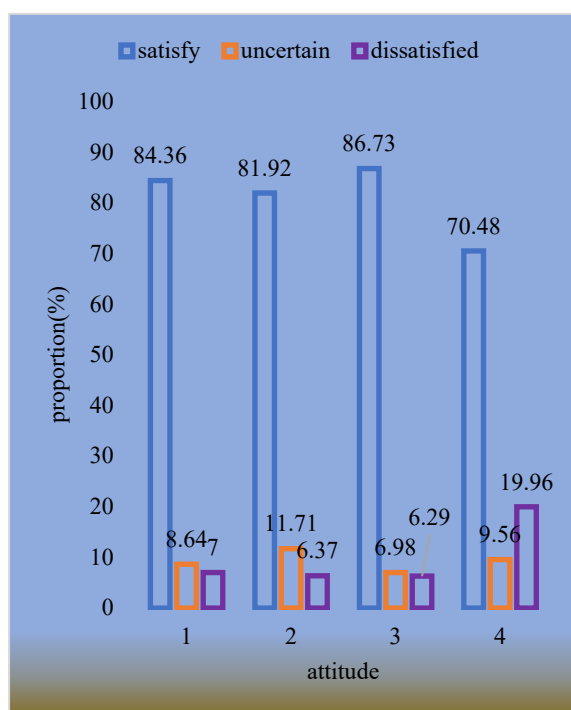


Figure 2: Statistical results of students' satisfaction with informatization teaching

#### 4.4 Student Satisfaction Survey

##### 4.4.1 Improve the ability of professional teachers to apply information technology

Although the school has organized pre-job training for teachers and conducted training on educational theory and technology, teachers are not consciously aware of the application of information technology. The teaching design is also very at a loss, do not know when to introduce information technology for teaching content, how to introduce information technology. Teachers' awareness and ability to apply information technology is the key to the success of teaching reform. In order to strengthen the application of information technology of college teachers, it is necessary to improve teachers' educational technology ability through training, including the awareness and attitude of applying information technology, the theory and method of information technology learning and teaching, and technical knowledge (such as PPT design, Flash, PS, and Vegas, etc.), and innovate the form of training, adopt the method of special training + theme seminar + on-site observation + micro-teaching, to comprehensively improve teachers' educational technology ability.

##### 4.2.2 Linking Theory with Practice

The environmental design major is mainly based on hands-on practice, and its textbooks are often full of general principles. The connection with life practice is not specific enough, some are too blunt, some are too theoretical, and cannot stimulate students' interest. Therefore, informatization methods should be adopted in the classroom. Combined with real life, through the analysis of some designs in reality to strengthen students' understanding of design.

## 5 CONCLUSION

Taking the course teaching of environmental design major as an example, this paper integrates information technology such as multimedia teachers and network teaching platforms into the course teaching. The P value of self-learning ability is 0.002, and the P value of team cooperation ability is 0.006, indicating that the two teaching methods have significant differences in the improvement of students' ability, and the mean results show that the information-based teaching method is effective in improving students' ability. It is more obvious that the students' satisfaction with the information technology teaching is relatively high, which shows that the integration of information technology into the teaching of environmental design courses plays a positive role.

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