




Communicative Image Expression in Teaching of Computer-aided Design for Environmental Art Major

Feng Niu 

School of Art and Design, Henan Institute of Technology, Xinxiang, Henan 453003, China, nf@hait.edu.cn

Corresponding author: Feng Niu, nf@hait.edu.cn

Abstract. This study uses computer-aided design to carry out a full range of research on the expression of communicative images in the teaching of environmental art, starting from the practical teaching process. The detailed teaching objectives and the overall course of environmental art Under the guidance of the concept, the reform of the cultivation method of the environmental art major is regarded as the core of the environmental art major, and from the aspects of changing the teaching mode, changing the teaching method of the course, controlling the course implementation process, and organizing the content of the environmental art professional course. Several practical suggestions and ideas are summarized. The ideas therein have greatly promoted the goal of replacing courses that do not conform to the trend of the time with environmental art professional renderings with more connotative and novel course, and the level of teaching has been greatly improved. In particular, the suggestion that the innovative thinking and technical methods of the teaching content are integrated with each other, and the two-way implantation of the system into the system of environmental art professional course is particularly effective. At present, computer-aided design technology has gradually penetrated into all walks of life, and its application in all walks of life has also become more mature. The introduction of computer-aided design technology into the construction of environmental art professional courses can build a better environmental art professional experimental system.

Keywords: Environmental art; CAD teaching; Communicative expression

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1 INTRODUCTION

With the rapid development of the economy and the continuous breakthroughs in science and technology, computer-aided design technology has begun to enter and be applied to various

industries such as aviation, medicine, military, and education. It has brought a transformation impact on various fields [1]. The rise of computer-aided design technology has provided unique new ideas for the effective development of teaching and training in the field of education, and injected fresh blood into contemporary education. The difference between computer-aided design technology and previous media technology lies in the directness and sense of control brought by immersion, which makes it possible for situations that cannot be achieved in teaching [2]. It provides a variety of alternative ways to make abstract knowledge more specific. In education and teaching, computer-aided design can be used as a medium for interaction, collaboration, and participation in learning, which can further inspire learners' enthusiasm for learning. But it also caused many people to have the following concerns: the vocational colleges have increased the enrollment indicators. It does not mean that the quality of the recruited students is getting worse. If the education level is not keeping up and the quality of teaching is not guaranteed, whether the students trained can be adapted to the needs of the market. These concerns also reflect to a certain extent the current hand-painting in the environment. Many problems in the art professional course education. Lima's "Design Fast Expression Technique" book can be concluded that the education method advocated it is essentially the "permanent word method" [3]. Kondo adopted the project-based hybrid teaching model in the MOOC environment in the "Database System Principles" course [4]. It has been proved through practice that developing the hybrid teaching model in the MOOC environment can improve the quality of teaching and enhance students' interest in learning [5]. Piñeiro-Otero and others have studied flip teaching that combines MOOC with traditional classrooms. Students complete MOOC learning before class and complete flip class learning in the classroom [6]. Vestergaard used MOOC learning to meet the diverse needs of students. Observe the progress of students and help students solve problems when necessary, so combining MOOC with traditional teaching is a very effective teaching model [7]. Lim and others designed a hybrid learning model based on MOOC, which combines MOOC with face-to-face classroom teaching [8]. First, it analyzes the teaching objects, teaching content, and teaching resources, understands MOOC curriculum resources, creates class discussion groups, and publishes online learning tasks; In the face-to-face classroom, teachers sort out the knowledge of important and difficult points, arrange classroom assignments in a targeted manner, and consolidate and improve [9]. LeeSejin et al. built an effective index system and evaluation model corresponding to the MOOC mixed teaching model [10].

Since observations in hand-painted tutorials and teachings are still relatively rare. Most of the existing inquiries are from the perspective of methods in vocational concept tutorials, focusing on the study of methods. They have not established the core position of hand-drawn tutorials and teaching in vocational education. They paid attention to the cultivation of innovative ideas for training vocational students by hand-painting. This article wants to find out the existing teaching methods in hand-painted teaching, the old teaching methods, the irregular curriculum structure, the imperfect education comment system, and the too simple and repeated teaching content through investigation, assessment, research, and summary. After in-depth assessment and research, we will change, modify and build a more novel, more connotative and more completely hand-painted course teaching system. The combination of theoretical exploration and practical operation. In this paper, the study of hand-painted course in vocational colleges should not only study how to take environmental art professional course, but also explore the practical problems that hand-painted course is currently dealing with, that is, hand-painted in modern data. The question of value remaining under the trend of the vigorous development of new media, and how to guide children's brain thinking.

2 COMPUTER-AIDED ENVIRONMENTAL ART TEACHING COMMUNICATIVE GRAPHIC EXPRESSION ANALYSIS

2.1 Analysis of Graphical Representation Model for Teaching Communication

Set the criteria, compare each element of the same level in pairs, and generate a judgment matrix based on the obtained results. Due to the reciprocity between the two comparisons, the system performs $n(n-1) / 2$ pairwise comparisons. The ranking derived from the comparison between the two pairs can more fully reflect the investigator's analysis and judgment of the problem, and can concentrate more information for the decision maker. Therefore, by performing $n(n-1) / 2$ comparisons, the judgment matrix is an $n * n$ square matrix.

Let the judgment matrix be:

$$M = \begin{bmatrix} m_{11} & m_{12} & \dots & m_{1n} \\ m_{21} & m_{22} & \dots & m_{2n} \\ \dots & \dots & \dots & \dots \\ m_{n1} & m_{n2} & \dots & m_{nn} \end{bmatrix} \tag{1}$$

The analytic hierarchy process judges the matrix label and its meaning, and uses the pairwise comparison method 1-9 comparison scales to construct the comparison matrix. The meaning of the scale is shown in Table 1.

Scaling	meaning
1	The two factors are of equal importance
3	One factor is slightly more important than another
5	One factor is significantly more important than the other
7	One factor is particularly important compared to another
9	One factor is extremely important compared to another
2,4,6,8	The median value of the above adjacent judgment
Reciprocal	If the importance scale of element i compared with element j is a_{ij} , then the scale value of element j compared with element i is $a_{ji} = 1/a_{ij}$

Table 1: Scale meaning.

In order to maintain the consistency of the questionnaire and the computability of the judgment matrix, it is necessary to test the consistency of the judgment matrix. Sometimes, because the problem to be solved is too complicated, too many indicators will cause confusion, and inconsistent judgment matrices will occur from time to time [11]. The process of calculating the consistency of the matrix is as follows.

To calculate the consistency index DI, the formula is as follows:

$$DI = \frac{\lambda_{max} - m}{n - 1} \tag{2}$$

To calculate the consistency ratio DR, the formula is as follows:

$$DR = \frac{DI}{RI} \tag{3}$$

RI represents the average random consistency index, which is obtained by calculating the average value after a large number of experiments. The total ranking weight is obtained by synthesizing the weights under a single criterion from top to bottom, and its calculation formula is:

$$H^k = m^k m^{k-1} \dots m^3 H^2 \quad (4)$$

H^2 is the total ordering of the elements in the second layer to the target, and m^k is the ordering of the elements of the k-1 layer to the elements of the k-1 layer.

In the multi-objective decision-making evaluation plan, there are m alternatives and n evaluation indicators. The evaluation index values of each alternative constitute a multi-objective decision matrix J , which is the j -th indicator of the i -th alternative. Index value. Dimensionless matrix M into a matrix:

$$J_{ij} = (J_{ij})_{m \times n} \quad (5)$$

$$J_{ij} = x_{ij} / \sum_{i=1}^m x_{ij} \quad (6)$$

The entropy combination weight is the subjective weight obtained by combining the objective weight of the entropy weight method and the analytic hierarchy process. The weight obtained by the analytic hierarchy process is J_{ij} , and the weight obtained by the entropy weight method is x_{ij} .

$$\beta_j = w_i * e_i / \sum_{i=1}^m w_i * e_i \quad (7)$$

2.2 Design Analyses of Teaching Activities

Teaching activity is a category of understanding and grasping teaching thinking and methods. It examines and reveals the internal connection and structure of teaching with active thinking and methods. Teaching activities are formed by teachers and students under the conditions of teaching and learning, leaving Teaching and learning conditions cannot produce teaching activity. Pay attention to the condition of restricted access before conducting teaching activities. Therefore, restrictive access reduces the student's learning scale, makes the course more refined, and makes the student's personalized learning possible. In SPOC instructional design, SPOC instructional activities are divided into three parts: pre-curricular activity design, in-class activity design, and after-class activity design, as showed in Figure 1, which is explained in detail.

According to the SPOC teaching activity design diagram, the pre-curricular activity design is divided into teachers and students. In teacher activities, teachers must first prepare the teaching resources of the course and upload the prepared resources to the platform. Then the teacher prepares the learning task list of this course. The learning task list of different chapters is also different. Upload the learning task list to the platform before the students start the class. In student activities, students learn to complete relevant tasks according to the learning task list. Teachers and teaching assistants can promptly answer students' questions in the discussion area in the discussion area.

According to the SPOC teaching activity design diagram, the activity design in the class is divided into teachers and students. In teacher activities, teachers sort out the questions raised by students in the platform before class, and choose representative questions to answer in a unified way in the classroom. Explain the key and difficult content of the course in this section, comment on the small assignments submitted by the students, summarize the knowledge points of the course learning, and transform the students' understanding of knowledge from shallow to deep. In student activities, students raise questions that they have not yet solved in their pre-school learning, and both teachers and students can respond accordingly.

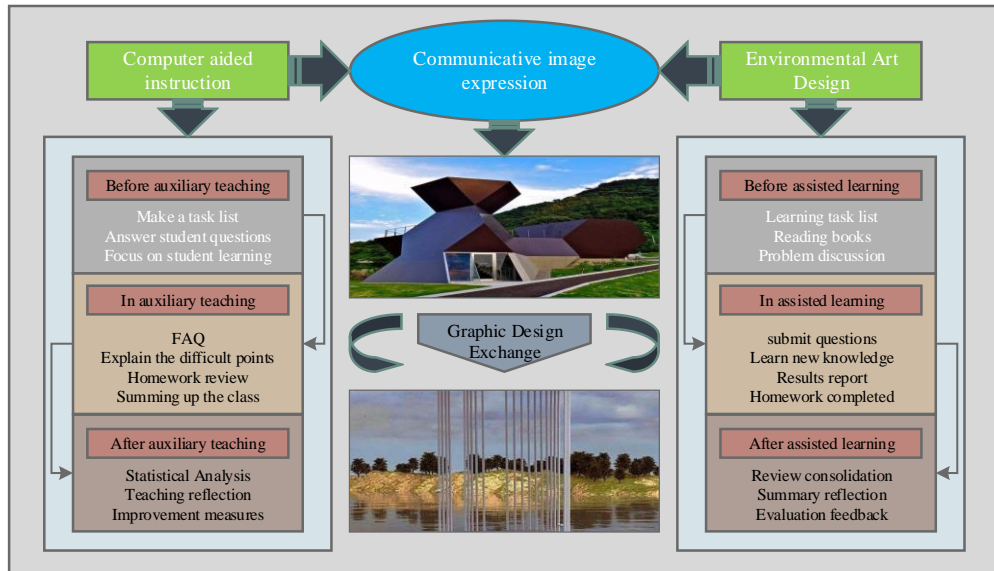


Figure 1: Design of teaching activities.

The opportunities for communication and interaction during the question and answer process of teachers and students have also increased. Students learn new knowledge of chapters in the classroom, and finally report on small assignments completed before the class. According to the SPOC teaching activity design diagram, the after-school activity design is divided into teachers and students. In teacher activities, teachers collect student learning data on the platform. These learning data include students' video viewing, discussion area interaction, course access, and homework completion. After analyzing the data, teaching summary and corresponding improvement measures are proposed. Strive to complete the improvement before the next course, through many applications and improvements, optimize the SPOC instructional design. In the student activities, students review and consolidate the knowledge points they have learned, summarize their problems in the learning process, and give teachers corresponding feedback to help teachers improve the SPOC instructional design.

Teaching evaluation is a dynamic and cyclical process. It requires teachers, students, and administrators to adopt multiple evaluation methods to continuously evaluate teaching. The teaching evaluation design stage includes clarifying the evaluation objectives, analyzing the evaluation content, determining the evaluation subject, and selecting the evaluation method. Clear evaluation goals Evaluation includes two aspects, one is whether students can create comics independently in this course, and the other is to verify the SPOC teaching effect. This evaluation has both final and formative evaluation. Formative evaluation is mainly used for the evaluation of students' online course, and final evaluation is mainly used for the evaluation of student comic work. Analyze the teaching effect from three aspects: learning ability, learning attitude and academic performance. Among them, learning ability includes students' self-learning ability and collaboration ability. Course visits, online video learning time, and discussion board participation reflect student learning attitudes. Evaluation of academic performance includes students' online course performance and traditional classroom performance. The evaluation subject is diverse, and teachers and students are the subject of evaluation. The evaluation methods are diverse, and the evaluation methods used for different purposes are also different. Combining the content of this course, we are going to use case study methods, survey research methods, and social network analysis methods for evaluation.

3 RESULTS ANALYSIS

3.1 Pre-test and Data Analysis

One of the pre-test tests is to obtain the results of the experimental class and the control class to participate in the environmental art test. The number of male and female students in the two classes is tested for the difference between the pre-test results through the independent sample T test using SPSS software. Using SPSS software to collect and analyze the student's achievements as a pre-test data analysis, the test results of the two classes of students are shown in Figure 2.

It can be seen from Figure 2 that the average score on the pre-test of the experimental class and the control class differs by 2.09, which shows that the pre-test scores of the two classes are not different. Using the SPSS independent sample T test, the Sig value is 0.81, which is greater than 0.05. The two-sided Sig value in the first line is 0.34, which is greater than 0.05, indicating that there is no significant difference in the pretest scores of the two classes, and the learning level is basically the same.

Among the students in the two classes, there were 16 boys and 15 girls in the experimental class, and 15 boys and 16 girls in the control class. There was no significant difference in the gender ratio. Through the examination score test and the comparison of sex ratio, it is concluded that the experimental class and the control class have similar conditions in terms of learning foundation, learning ability, gender personality and so on. A total of 208 questionnaires were distributed, and 208 were actually recovered. A total of 208 items met the survey requirements, with a recovery rate of 100%. Through statistics on the answers to the questionnaire, analyze the attitude of art students to the new class of Yi class, and the new learning method of micro-learning in Yi class, and evaluate when conducting micro-teaching experiments on the Yi class platform. You may encounter problems and consider countermeasures in advance.

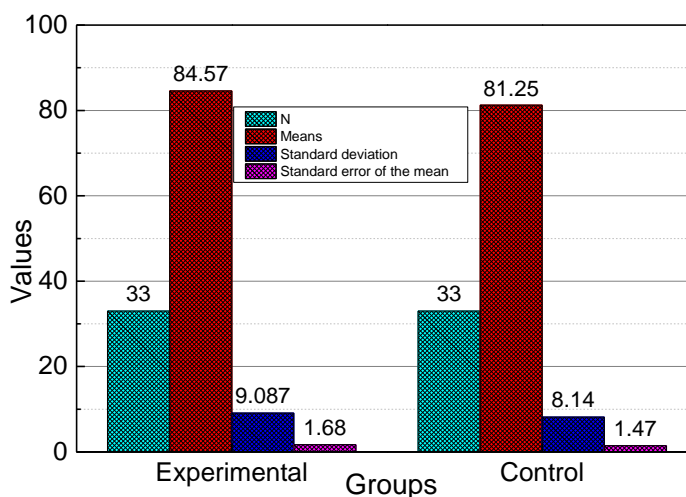


Figure 2: Student's pre-test score's independent sample T test results.

According to the statistical results of the survey in Figure 3, most students have a certain understanding of Yi class as an educational type platform, and most students understand that Yi class has the function of education and teaching. However, students who think that the popularity of the Yi class is generally poor and poor account for almost half, and the proportion of students who are familiar with and very familiar with the basic operations of the Yi class is not high, proving that most students have a basic understanding of the Yi class. However, the degree of

understanding is not deep, and it may have a certain impact on the micro-class learning of the platform.

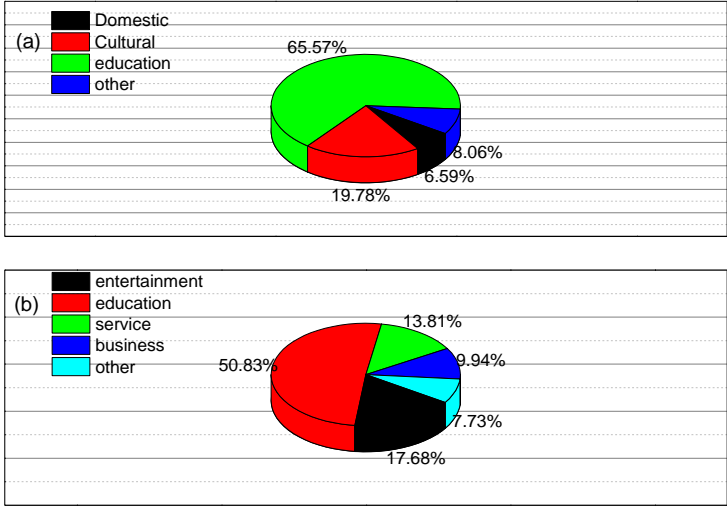


Figure 3: Student function judgment statistics.

This factor should be fully considered when conducting the experiment to ensure that every student understands how to operate. However, the students who are familiar with the basic operation of the Yi class and the general familiarity still account for most of them. As long as they understand the basic operation, they can carry out micro-learning, and the overall impact on the experiment is not great. The unity of students' image expression and thinking design also requires training. The direct goal of expressive design is to help student's master skills. It no longer limits to surface painting. Students must be guided to actively understand the close relationship between design and expression. Viewing the expression diagram from a higher angle allows students to interact between the thinking and performance art represented by the design diagram. The purpose is to cultivate students' ability to have uniformity in two aspects. In the specific process of operation, the suggestion to students is to write a diary in the United States, complete the diary with the form of icons, and replace the rigid text symbols with flexible images to help students have faster inspiration when the purpose is to express. As showing in Figure 4, it is a questionnaire reliability analysis. That is, you can have ideas anytime, anywhere, express anytime, anywhere, and use whatever skills and methods you want. Students should also be guided to admire the work, analyze the advantages and disadvantages to improve the appreciation of the work, have their own unique thinking, design inspiration for the work, and improve the students' ability to produce renderings. In particular, the use of copying the work of the masters can cultivate a sense of art and accept the influence of beauty, so that students can improve their abilities in the four processes of cultivation of art and design of creative activities.

3.2 Analysis of Calculation Results of Entropy Combination Weight

According to the implementation steps of the entropy weight method, the original data is first constructed into a matrix X, and the original matrix X is standardized according to the formula to obtain a standardized matrix P. And calculate the coefficient $K = 1 / \ln(30)$, and use the aforementioned formula to calculate the entropy value of each index, and finally obtain the weight of each index entropy method (Figure 5).

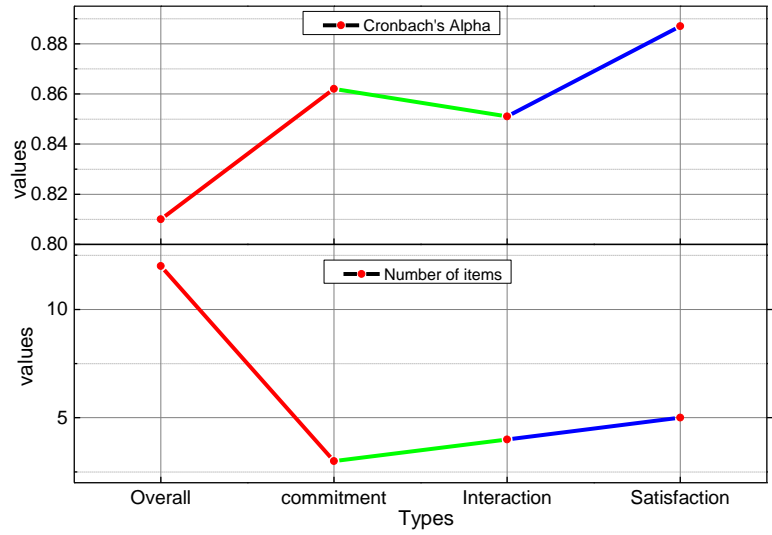


Figure 4: Questionnaire reliability analysis.

Finally, according to the entropy combination weight formula, the comprehensive weight of the scholar's comprehensive academic influence evaluation index system is obtained. The result is shown in Figure 6.

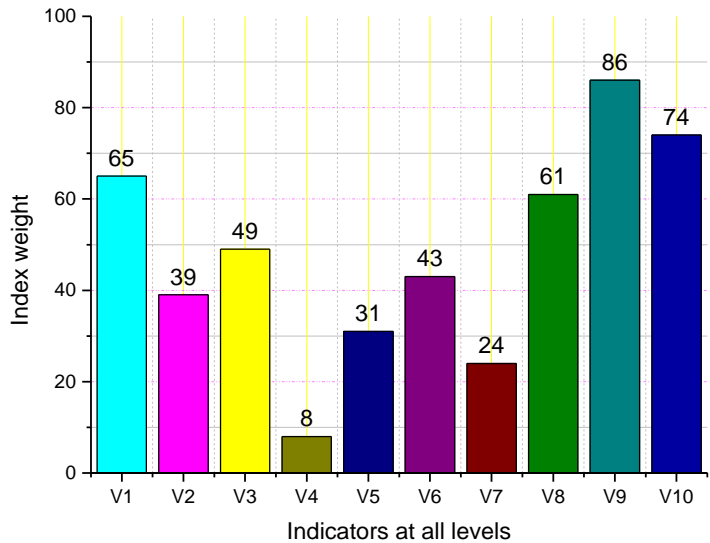


Figure 5: Entropy weight method to determine the weight of each index.

According to the weight of the combination of AHP and entropy weight method, the TOPSIS algorithm is used to rank the influence of scholars, so as to obtain the comprehensive influence calculation of scholars to replace metrology. From the perspective of tiered weight of alternative measurement indicators, the application-level indicators have the highest proportion and the structure is more reasonable. According to the research results, in order to verify the difference between scholars' comprehensive influence and citation influence, a schematic diagram comparing

the comprehensive influence ranking (named APS) and citation number ranking is drawn, as showed in Figure 7.

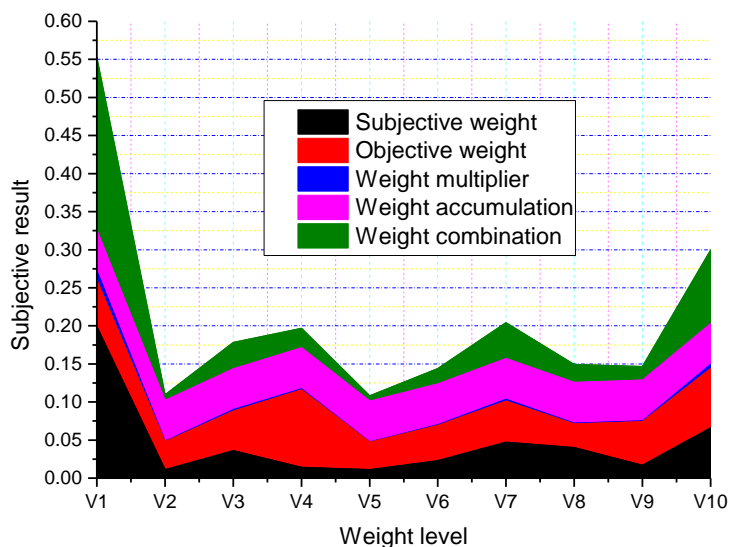


Figure 6: Entropy combination weight determines the weight of each indicator.

It can be seen from the comparison that the comprehensive academic influence of scholars and the influence of scholars' citations are slightly different. The citation count is not much different from that of scholars under the H index ranking, which shows that the ranking results of influence based on citation systems are relatively similar. From the observation of the influence of scholars based on alternative metrology, since the scholar's serial number is Altmetrics.com website AAS (alternative metrology influence score) score ranking, it can be seen that the comprehensive impact evaluation (APS) based on alternative metrology and the original AAS ranking are significant different. The ranking of scholars 2, 3, 6, 10, 11, 12, 13, 21 under comprehensive academic influence is lower than that under scholars' citation academic influence. Scholars 4, 6, 9, 15, 16, 17, 18, 20, 22, 26, 27, 28, 29 are ranked higher than cite academic influence in comprehensive academic influence. This type of a scholar can be called a "star" scholar. This type of scholar is ranked higher on social media than the citation academic influence. This type of scholar is widely spread on social media and has a highly comprehensive academic the influence and popularity are high, and the dissemination of academic achievements under the social network can improve its comprehensive academic influence. The high comprehensive academic influence will make it easier for the general public who pay attention to related research fields to pay attention to the scholar and the academic works of the scholar, and increase the exposure of their academic works.

4 CONCLUSION

Through technology and auxiliary design principles, the environmental art major's course content, learning states, learning environment and learning objectives are analyzed. Under the existing talent training conditions, the talent teaching of environmental art major was discussed and analyzed, which proved the importance of environmental art technology curriculum reform. Establish a new model of hand-painted performance technique curriculum reform, put forward suggestions on the content of the curriculum and the setting of class hours, and finally rectify the relevant teaching models and propose curriculum reform strategies.

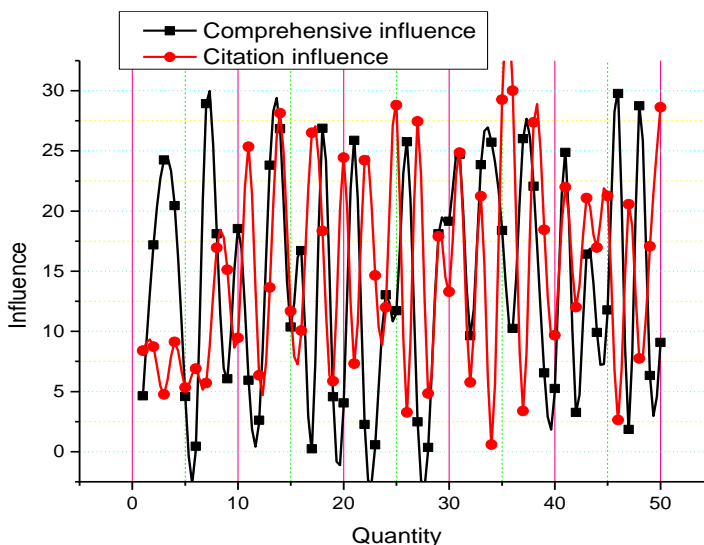


Figure 7: Comparison of influence.

It can be clearly understood that vocational students have relatively weak knowledge reserves compared with general college students, and their innovation ability is relatively poor. Therefore, it is very important to establish a reasonable teaching faculty structure to allocate students' students reasonably and effectively. Learning course time, combined with the relevant concepts of hand-painted performance techniques, mainly improves students' innovative ability in related teaching forms, including frame-based training and subject-based training. Arranging a certain amount of time to carry out related competitions can promote the competitiveness of students and develop students' creativity.

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Feng Niu, <https://orcid.org/0000-0003-4892-1688>

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