

Research on the Fairness Evaluation of Teaching Quality of Art and Design and Design in Colleges and Universities in the New Era

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Abstract: the 21st century is not only an era of technological globalization and economic globalization, but also an era of development and change. Because of this, the fine arts and design and design education of colleges and universities also need to change with the times and make timely changes. At present, the characteristics of asymmetry in information, the failure of moral behaviour, and the simple method of processing evaluation data in the evaluation of classroom teaching quality in colleges and universities can easily lead to bias in evaluation results. In view of this, the article is based on the combination of individual evaluation opinions and overall evaluation opinions, and the combination of horizontal proportions and vertical rankings. It evaluates classroom teaching quality from three aspects: student evaluation concentration, evaluation coordination, and significance test of coordination. The collected data was subjected to rigorous mathematical analysis, multi-dimensional model construction and scientific statistical inspection, thereby ensuring that the results of classroom teaching quality evaluation reached fairness and justice.

1. Introduction

With the rapid development of society and economy, people's quality of life and the general improvement of cultural and artistic accomplishment can no longer meet the demand for traditional art and design, and the demand for art and design creative economy adapted to the development of the times is increasing. From the enrolment of arts and design majors in recent years, it is not difficult to see that college and art design majors have become hot spots for candidates to apply for exams [1]. The development of creative economy has impacted the education of traditional arts and design majors and has impacted the fine arts of higher education. And design quality education puts forward more general requirements. As an educational institution that teaches, trains, innovates, and serves the society, colleges and universities occupy a very important position in the construction of socialist culture, and play a leading role in inheriting culture, creating culture, and serving the society [2]. The core is advanced cultural spirit. . The cultivation of college students' art and design quality in the art and design education in colleges and universities fully reflects this essence. At the same time, it will also provide the basis for talents and cultural communication for the development of the cultural industry, especially the development of the creative economy [3].

At present, the classroom teaching quality monitoring and evaluation systems of major universities in china mainly adopt the model of student evaluation, supplemented by supervision evaluation and peer evaluation. Student evaluation has a positive motivating effect, which can promote teachers to devote themselves to teaching, which is helpful for teachers to find out the shortcomings of teaching from the perspective of students to improve the quality of classroom teaching [4]. However, due to the emergence of a series of phenomena such as student evaluation, student abandonment, and student random evaluation, this traditional model that reflects the quality of teachers' teaching by students' direct evaluation of teachers' efforts and abilities has been widely questioned [5]. The scientific nature of the classroom teaching quality evaluation system, the fairness and impartiality of the evaluation results have also caused educators to think about how to properly construct a classroom teaching quality evaluation model in order to achieve the fairness of classroom teaching quality evaluation and become a teacher and student and an education topics

shared by managers [6].

In order to improve art education level and teaching quality, art teachers should continuously improve their professional quality and education and teaching level, in-depth research on the design methods of art teaching courses [7]. This paper discusses the effective reform measures and countermeasures for the module of teaching evaluation, which should be aimed at the various problems existing in contemporary college art education and how it should be developed [8].

2. Analysis of the Current Situation of the Evaluation of Art and Design Teaching in Universities

Teaching evaluation activities are a process of teacher teaching and bilateral activities of student learning. Therefore, when conducting a current survey of art teaching evaluation in colleges and universities, it is divided into two different evaluation subjects, teachers and students, so as to evaluate teachers' teaching evaluation and student learning. Refine the analysis to arrive at a targeted research plan to evaluate and drive the teaching [9].

Therefore, in order to understand the organizational activities of teachers in teaching evaluation and the learning status of students, collect opinions and suggestions on the entire teaching evaluation process from teachers and students in order to study more scientific and effective evaluation of art teaching in colleges and universities. Forty-five art teachers in the survey conducted a questionnaire survey, and then made detailed charting and analysis based on the survey data and interview records [10].

2.1 Investigation on the Status of Teachers' Teaching Evaluation Activities

The evaluation of classroom teaching is the most direct influencing factor of teacher evaluation influencing the learning effect of students. It investigates and analyses the standards, methods, methods and contents of classroom teaching evaluation, summarizes the shortcomings and deficiencies of existing teaching evaluation models and improves them. The most intuitive change in the learning effect of students reflects the teaching effect of teachers.

As shown in Figure 1, teachers' classroom teaching evaluation standards mainly focus on the participation of students in classroom activities, accounting for 76% of the total survey population. In addition, 65% and 52% of teachers believe that the differences within individuals and whether they are clear The expression of course goals is also an important criterion for teaching evaluation. 42% and 36% of the students choose the logical ability to master the knowledge system and the evaluation criteria that integrate the abilities of various disciplines.

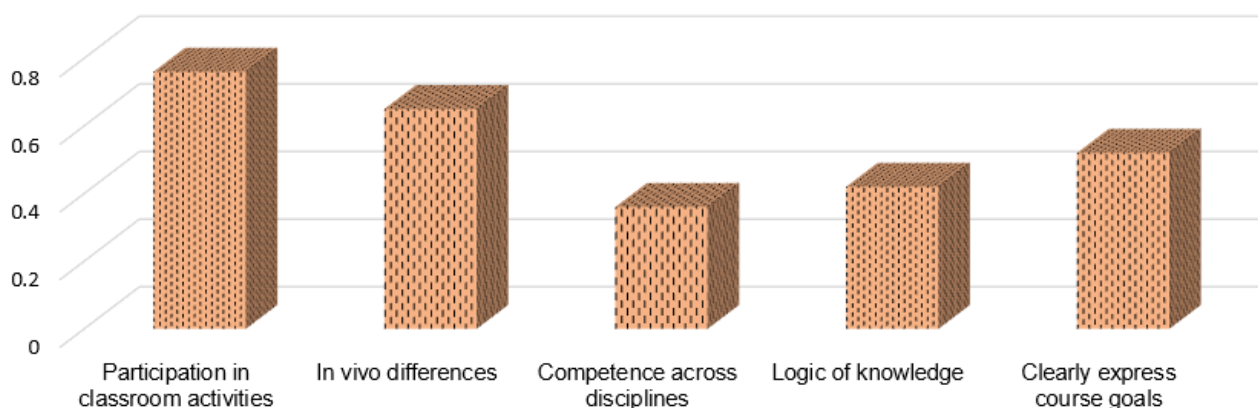


Fig.1 Survey Results of Teachers' Teaching Evaluation Standards

A survey of teachers' teaching evaluation methods (Figure 2) shows that more teachers choose classroom tests, and 81%, 62%, and 61% of teachers think questioning and assignments are also commonly used in teaching evaluation. In addition, Another 32% of teachers believe that the evaluation method of blackboard writing has an irreplaceable role in the evaluation of classroom

teaching, and 11% and 19% of teachers choose written comments and other evaluation methods.

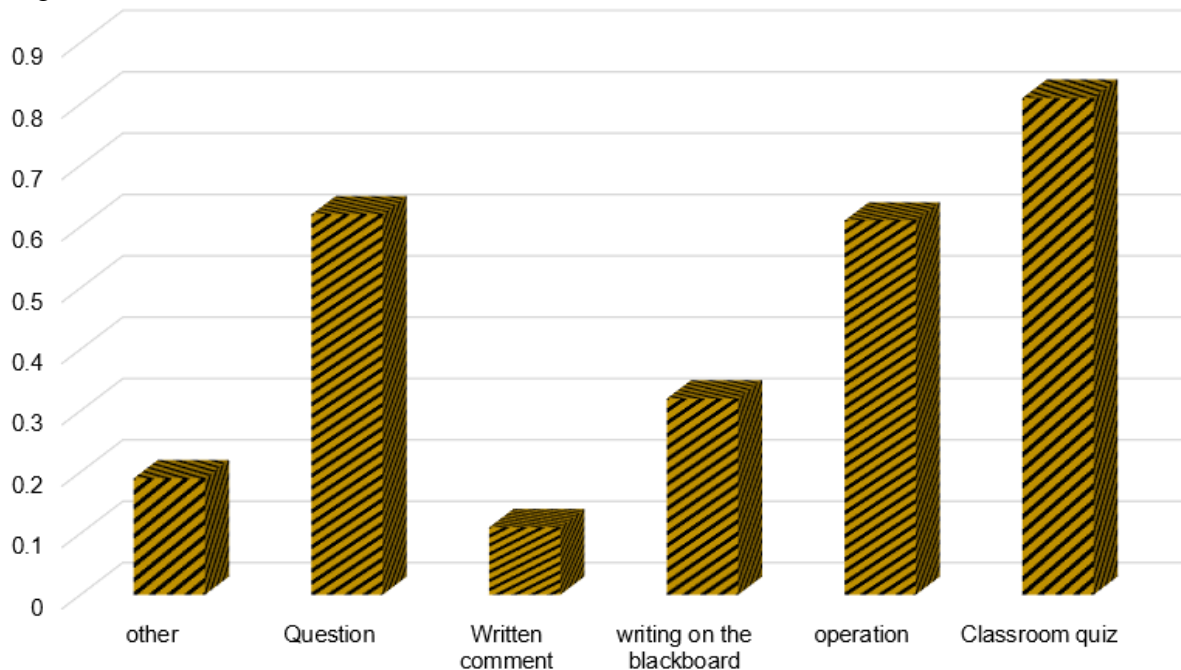


Fig.2 Survey of Teachers' Teaching Evaluation Methods

2.2 Analysis of Survey Results of Teaching Evaluation

The difference in students' classroom learning effects largely stems from students' unclear learning goals that they should complete. Teachers often do not grasp the teaching goals accurately in teaching, which leads to a certain difference between the classroom learning goals of learning comprehension and the teaching goals of teachers.

Instructional design often lacks the overall logical relationship. As a result, teachers do not have a proper evaluation plan when judging the requirements of students to achieve learning goals, which leads to confusion between evaluation and goals, and does not make appropriate evaluations of students' learning conditions. There is a certain deviation in the evaluation of teaching effect and student learning effect. Teaching evaluation should not only be consistent with the learning goals in "What should I know" and "What should I do", but teachers should also construct clear assessment methods for different learning goals.

3. Analysis of Influential Factors of the Fairness Evaluation of Classroom Teaching Quality in Colleges and Universities

As an important measure of teaching management in colleges and universities, the evaluation of classroom teaching quality focuses on the review and improvement of teachers' teaching behaviour and the improvement of the experience and value of student development. The goal is to break through the barriers of teachers, students, and management to better achieve the harmonious unification of the intrinsic value of the common development of teachers and students, the tripartite synergy and talent training, and the external value of serving the society. The evaluation of classroom teaching quality is a complex and systematic project involving teachers, managers, students and other personnel. The evaluation process and results are affected and restricted by many factors. Compared with supervisory evaluation and peer evaluation, student evaluation has the advantages of full-scale, full-process, and more data. However, due to asymmetric information and simple data processing, students are in a limited state on key issues such as teaching goals and methods. Evaluation activities fall into a situation of inadequacy of reason, information and cognition, which leads to adverse selection and moral defeat, resulting in the objective and fair evaluation of classroom teaching quality.

3.1 Information Asymmetry

College teachers, managers and students have different characteristics in classroom teaching quality evaluation, such as differences in information acquisition, and the phenomenon of information asymmetry inevitably exists. From the perspective of students, this information asymmetry is mainly reflected in the following aspects:

(1) Students are at a disadvantage in acquiring knowledge. Through classroom teaching activities, students can clearly grasp the teacher's teaching attitude, teaching content, and teacher-student relationship, but they cannot grasp and accurately judge the teacher's knowledge reserve, the rationality of teaching design, and the scientific of the selection of teaching materials Information. This makes students in the evaluation operation, especially when facing multiple evaluation teachers, multiple evaluation indicators, a large test pressure can not give a reasonable and objective evaluation, and often tend to give those who have a good relationship with the students, blindly cater to Students, while lowering the teachers 'higher evaluation of students' learning requirements. In the long run, this mutual compromise mechanism can easily breed adverse selection, which is contrary to the original intention of students to evaluate the quality of classroom teaching.

(2) Students do not understand the management mechanism of evaluation. In the specific implementation of classroom teaching quality evaluation, students only know the specific evaluation time and operation process. They know little about the evaluation purpose, evaluation significance, and evaluation application, and even do not care. As for the teachers of the course, there is also the problem of information asymmetry, which mainly comes from whether teachers can reasonably grasp the preparation of lessons, teaching attitude, teaching methods, and the advanced nature of teaching materials. There are information disadvantages in the implementation process and data processing. This can easily breed adverse selection in evaluation and affect the fairness of evaluation results.

3.2 Evaluation Data Processing

The classroom teaching quality evaluation data generally uses the index system to quantify the score or prioritize, and use the average value of each indicator given by the student to perform simple average or linear weighting as the student's evaluation of the teaching quality of the course. As the course's teaching quality evaluation results, use this as a basis for ranking or selection. The advantage of this method is that it is simple and feasible in a one-dimensional space, but it cannot fully demonstrate whether the evaluation of the same course by different students in the same teaching class is concentrated and collaborative, and it is not possible to evaluate the systematic significance of multi-dimensional evaluation opinions Proficiency tests can easily lead to unfair evaluation results due to distorted data or excessive dispersion, and some teachers and students question the evaluation results due to lack of rigorous mathematical basis. Therefore, in order to ensure the fairness of classroom teaching quality evaluation in colleges and universities, it is particularly important to conduct multidimensional analysis, systematic processing and scientific inspection of student evaluation data.

4. Implementation Path of Teaching Quality Fairness Evaluation Model

Based on the combination of individual evaluation opinions and overall evaluation opinions, the combination of horizontal proportions and vertical rankings, this paper focuses on the core issue of classroom teaching quality evaluation, from student evaluation concentration, evaluation coordination, and significance test of coordination. In all aspects, rigorous mathematical analysis, multi-dimensional model construction, and scientific statistical testing are performed on the data collected in classroom teaching evaluation to demonstrate whether multiple students' evaluation of multiple courses in the teaching class is centralized and coordinated. In order to ensure that the results of classroom teaching quality evaluation are fair and just.

4.1 Conditional Assumptions and Parameter Settings

Assume that the evaluation standards, grading levels, evaluation indicators, and weights of college classroom teaching quality are clear. There are m students in a teaching class who have jointly studied n courses. Now, m students are required to have the quality of classroom teaching of n courses Make grade judgments and score evaluations. The evaluation grade and scoring standard of each course is defined as: excellent (90-100), good (80-90), fair (70-80), and qualified (60-70).), Unqualified (<60), where the excellent value is 5, the good value is 4, the general value is 3, the qualified value is 2, and the unqualified value is 1.

4.2 Student Assessment Concentration

The concentration of student evaluation is a numerical expression of the aggregation of evaluation scores of many students for the same course of study, and is the unity of the degree of acceptance and recognition of classroom teaching of the same course of study by many students. In classroom teaching evaluation, the concentration of student evaluation is an intuitive performance and an important basis for reflecting the fairness of the evaluation. Three indicators are constructed from the horizontal and vertical levels to reflect and compare. The horizontal level is calculated by calculating the arithmetic mean M_j of the course being evaluated. To ensure the concentration of student evaluations, the vertical level reflects the overall opinions of all participating students on the teaching of the course by constructing the weight coefficient K_j of the course. At the same time, in order to accurately reflect the pros and cons of the course in all the evaluated courses, the total number of grades R_j in the courses offered is calculated. The above three indicators can intuitively reflect the concentration of students' evaluations, effectively avoiding the reverse Choices and moral hazards are not fair.

4.3 Student Evaluation Coordination

The degree of coordination mainly measures whether the internal elements of the system have synergy and consistency in the development process. In the course teaching quality evaluation, the student evaluation coordination degree can reflect the fluctuation range of the evaluation of a course or all courses by all the students participating in the evaluation. On the micro level, the coefficient of variation V_j of the evaluated course is used to reflect the evaluation coordination of many students on the same course On the macro level, the overall coordination coefficient Q of students is constructed to reflect the synergy of many students on all participating courses.

4.4 Statistical Significance Test

In order to reflect the fairness of the students' evaluation of the quality of classroom teaching, the coordination of the evaluation data must be tested for statistical significance to ensure the reasonable and fairness of the evaluation results of multiple students. The significance test for the evaluation of the degree of coordination of students uses the $R - Person X_R^2$ criterion, comparing the degree of freedom $n-1$, and finds the specific value closest to the calculated actual X_R^2 and the corresponding significance level p in the X_R^2 distribution table. If p is less than the limit, students' evaluation of the quality of classroom teaching is considered feasible and fair.

$$X_R^2 = \frac{\sum_{j=1}^n (R_j - \bar{R})^2}{mn(n+1) - \frac{\sum_{i=1}^m \sum_{l=0}^L (t_l^3 - t_l)}{n-1}} \quad (1)$$

5. Case Study

5.1 Example Data Collation

In order to analyse the feasibility of the model for evaluating the fairness of classroom teaching quality in the university, the classroom evaluation results of a teaching class (12 students, 5 courses) in J University are selected for empirical analysis. J University is a university directly under the Ministry of Education that builds an interactive teaching evaluation system that focuses on teaching quality monitoring and promotes classroom teaching quality evaluation. In order to effectively control students' scoring at will, students adopt a model of degraded selection and corresponding scoring when evaluating classroom teaching of teachers, that is, students first make grade judgments on the courses being evaluated and give courses excellent, good, average, qualified, and unqualified. The five-level evaluation of the scores respectively corresponds to the values "5, 4, 3, 2, 1", and then each course is scored on a percentage scale for the corresponding interval. The specific data is summarized in Table 1.

Table 1 Evaluation Form of Classroom Teaching

| Student number | Course 1 | | Course 2 | | Course 3 | | Course 4 | | Course 5 | |
|----------------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|
| | Grade | Score | Grade | Score | Grade | Score | Grade | Score | Grade | Score |
| 1 | 3 | 70 | 5 | 92 | 3 | 78 | 5 | 93 | 4 | 81 |
| 2 | 4 | 81 | 5 | 96 | 4 | 85 | 5 | 96 | 3 | 76 |
| 3 | 3 | 73 | 3 | 78 | 5 | 95 | 5 | 93 | 4 | 82 |
| 4 | 4 | 85 | 2 | 69 | 4 | 88 | 5 | 94 | 3 | 75 |
| 5 | 4 | 84 | 4 | 88 | 4 | 84 | 5 | 91 | 3 | 76 |
| 6 | 3 | 73 | 4 | 86 | 3 | 76 | 4 | 87 | 4 | 85 |
| 7 | 2 | 68 | 3 | 70 | 5 | 91 | 4 | 88 | 5 | 91 |
| 8 | 2 | 67 | 3 | 75 | 3 | 76 | 3 | 76 | 2 | 69 |
| 9 | 3 | 77 | 2 | 69 | 3 | 73 | 3 | 78 | 3 | 74 |
| 10 | 3 | 78 | 3 | 76 | 4 | 81 | 4 | 84 | 3 | 76 |
| 11 | 4 | 82 | 3 | 71 | 4 | 83 | 4 | 86 | 4 | 87 |
| 12 | 4 | 89 | 4 | 88 | 2 | 66 | 3 | 79 | 4 | 82 |

5.2 Analysis of Results

According to the teaching quality fairness evaluation model constructed in the previous section, the calculation results are shown in Table 2. From the perspective of student evaluation concentration, in the three indicators of arithmetic average, specific gravity coefficient and grade coefficient, curriculum 4 and curriculum The value of 2 is higher than that of other courses, and the values of courses 1 and 5 are relatively low. As these three indicators reflect students' general acceptance and recognition of the quality of classroom teaching from the vertical and horizontal fronts, it can be inferred that the teaching quality of courses 4 and 2 is excellent, and courses 1 and 5 need to be improved. Combined with the degree of evaluation coordination, the coefficient of variation of the 5 courses are all controlled within 0.07, and the value of the coefficient of evaluation coordination of 0.71 is high, indicating that the students participating in the evaluation are more unified in the overall evaluation opinions of the courses they have studied, and the ranking of the coefficient of variation is comparative Desirable and fair, Course 4 has the most advantages, followed by Course 2, which strongly supports the results of evaluating concentration to a certain extent.

Table 2 Calculation Results of Teaching Quality Evaluation

| Evaluation dimension | Evaluation index | Course 1 | Course 2 | Course 3 | Course 4 | Course 5 |
|--------------------------|--------------------------|----------|----------|----------|----------|----------|
| Evaluation concentration | Arithmetic mean | 76.7 | 88.41 | 79.9 | 92.46 | 79.81 |
| | Specific gravity factor | 0.15 | 0.18 | 0.16 | 0.17 | 0.19 |
| | Total number of levels | 69 | 89 | 72 | 93 | 71 |
| Evaluation coordination | Coefficient of variation | 0.05 | 0.05 | 0.05 | 0.04 | 0.06 |
| | Coordination coefficient | 0.71 | | | | |

Through calculation, $X_R^2 = 15.86$, query the distribution table against the degree of freedom to find the significance level $p = 0.05$, and through statistical significance test, the classroom teaching quality evaluation results of 5 courses are fair and reasonable.

6. Conclusion

In the context of the new era of change, art and design education should be guided by the situation, change the evaluation method and guidance, and cultivate students' creative thinking. Correct evaluation of students can cultivate students' innovative spirit and promote the development of students' innovative thinking and innovative personality. This paper proposes a teaching quality fairness evaluation model. Using this method can also effectively identify individual students who are likely to produce adverse selection and defeat in the classroom teaching quality evaluation. Education provides a scientific basis for choice, and ultimately encourages students to form unique artistic personality and creative literacy.

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