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Research on online teaching quality evaluation based on learning analysis

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Abstract
In order to cope with the COVID-19 epidemic, the colleges and universities carry out online teaching with the help of various network platforms, and due to the repeated impact of the epidemic, online teaching has gradually developed into a normal teaching mode. Therefore, it is of great significance to build a scientific online teaching quality evaluation index system. With the help of information technology, based on a large number of sample data resources during the epidemic, this paper comprehensively collects the online learning behavior data and online and offline learning evaluation data of learners, integrates learning evaluation into each stage of online teaching, and deeply mines the learning process data and learning outcome data of learners. To construct a data-driven evaluation index system for online teaching course learning quality, and to provide reference learning quality evaluation indexes and methods for teachers of different courses to carry out online teaching in the post-epidemic period.
Key words: *Learning analysis; Online teaching; Teaching quality; The evaluation index*

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Introduction

In response to the COVID-19 pandemic in China, colleges and universities have widely carried out online teaching with the help of various online platforms such as Superstar, Wisdom Tree and Tencent Conference.At the same time, with the development of online open courses, a huge amount of education big data has been generated.How to use the new generation of information technology such as big data and artificial intelligence to dig out the useful information and rules hidden behind the massive data, effectively carry out the teaching process monitoring, improve learning evaluation, improve the process of teaching and learning, and improve the learning effect are the hot issues of online teaching at present and in the future. Affected by the repeated epidemic, online teaching has gradually developed into a normal teaching mode. Therefore, it is of greater significance to build a scientific online teaching quality evaluation index system.

Literature Review

At present, scholars have made abundant achievements in the research on teaching quality evaluation. The main aspects related to this study can be summarized from the following four aspects.

2.1 Research on teaching quality evaluation

The enrichment and development of teaching quality evaluation theory went through three stages: the first stage is the performance- only theory, which only focuses on students' academic performance and ignores students' individual growth;In the second stage, the pluralism of value evaluation is ignored and the realization of teaching objectives is too much emphasized.The third stage is to realize the characteristics of diversified evaluation methods and pay attention to the development evaluation of students.

The evaluation of teaching quality in foreign universities is much more complicated than that in China. There are many evaluation index systems of teaching quality, and there is no special unified standard. The methods of education evaluation in universities are also varied.Stufflebeam et al. (2007) proposed CIPP evaluation model, which isa good evaluation method.This assessment model takes classroom teaching itself as the evaluation object, andensures the reliability and scientific of teaching objectives through background evaluation.Input evaluation was used to evaluate the teaching plan.To ensure the orderly development of the teaching process through process evaluation;The CIPP evaluation model is referred to as the feedback of classroom teaching effect through the result evaluation.

The practical research of teaching quality evaluation in China mainly focuses on the evaluation of teachers' teaching behavior, and does not involve much in the progress and change of students in the teaching process.Wang Changhui (2015) conducted an empirical study on the teaching quality evaluation model by

applying the method of integrating theory and practice based on the analysis of teaching quality evaluation objects and teaching contents.Sullivan Huang (2016) constructed a teaching quality evaluation model based on the perspective of stakeholders and the hexad analysis method, and conducted an empirical study on the teaching quality using monitoring data.Wu Zhaoming (2017) diagnosed and improved teaching quality at all levels from three dimensions: education managers, teachers and students' sense of gain.

2.2 Researchon online teaching

Online teaching takes the network platform as the carrier of learning and presents the learning content in the form of multimedia. Teaching activities take place on the Internet and the learning track is recorded on the Internet. Through online self-study and online communication, students can achieve a certain degree of curriculum planning.Yang Jiaxing (2006) studied the theoretical basis and system of "online teaching" in online teaching, and pointed out that behaviorism theory, cognitive psychology, social learning theory and constructivism are the theoretical basis of online teaching.ZhouYingfeng et al. (2015) took medical courses as an example, designed a teaching model that organically combines online teaching with flipped classroom, and carried out teaching evaluation from three dimensions: online learning participation, learning effect, and satisfaction survey.Li Yuanyuan et al. (2020) took the online teaching of material chemistry course as an example to analyze the problems and solutions encountered in the current implementation of online teaching, and summarized the experience of online teaching.

2.3 Researchon learning and analysis

Learning analytics is defined by the Association for Higher Education Information, which defines learning analytics as the ability to use data and models to predict student outcomes and behavior and to process that information.Learning research object is the student and their learning situation, the analysis of the research is based on education activities of mass study data and analysis process of intermediate data, the goal of research is to assess and predict student activities, found potential problems, to provide decision support for stakeholder education activities, to optimize and design the learning process and learning situation.Learning analysis is defined by Siemens and Long (2011).Learning analytics mainly focuses on the analysis of courses and departments, and the direct beneficiaries are learners, mentors, and department managers.Learning analytics emphasizes real-time optimization of learning processes and learning situations.

2.4 Online teachingquality evaluation theory

Teaching quality evaluation is the basis of guaranteeing onlineteaching quality.Ren Ying (2006) studied the index system of online teaching quality, and constructed 4 first-level indicators, 11 second-level indicatorsand34 third-levelindicators respectively.Li Fengqing (2017) combined with the implementation process of blended teaching, constructed a general model of blended teaching quality evaluation index system in colleges and universities and applied it into practice.Lin Fang et al. (2019) constructed a blended teaching quality evaluation index system with teachers, students, instructional design, and teaching resources as the first- level indicators, 13 second-level indicators and 66 third-level indicators.Yin Xiaosan et al. (2019) used Gaussian function to determine the membership, and based on the fuzzy evaluation method, constructed the first-level evaluation index of MOOC teaching quality from the aspects of teacher performance, student performance and MOOC video.Based on process evaluation and summative evaluation, Yang Hao (2019) designed a blended teaching quality evaluation index system with moral education cultivation, learning method and ability cultivation,professionalqualitycultivation,professional knowledge, and skills as first-level indicators, 9 second-level indicators and 43 third-level indicators.

Existing research from the teaching quality management, the factors influencing the effect of classroom teaching and learning quality, teaching a lot of research on the evaluation index system and so on, but there are few will be learning evaluation and teaching process each link such as in-depth integration, process assessment and summative assessment needs to be systematic and scientific, the evaluation results timely feedback and visual needs further strengthening.With the help of information technology and based on a large number of sample data resources during the epidemic period, this study attempts to build a data-driven evaluation index systemfor online teaching quality, so as to provide reference learning quality evaluation indexes and methods for teachers of different courses to carry out online teaching in the post-epidemic period.

Construction of the evaluation index system for learning quality of online teaching courses

The construction of online teaching quality evaluation index system is highly professional, comprehensive, and complex. In practical teaching, educators should consider not only the characteristics of online teaching, but also the teaching objectives, requirements, and characteristics of specific subjects, to fully ensure the effectiveness of online teaching quality evaluation.

3.1 Principles for construction of evaluation index system

The evaluation index system of online teaching quality is an important basis and guarantee of online teaching quality.To ensure that the evaluation index system of online teaching quality plays the functions of supervision and incentive, it is required to follow the principles of objectivity, purpose, consistency, comprehensiveness, and operability of the index.

The principle of objectivity requires that the evaluationindicators should be determined scientifically and objectively, the evaluation process should be open and transparent, and the evaluation results should be published in time.

The purposive principle refers to that the purpose of online teaching quality evaluation is to improve the level of teaching quality and stimulate teachers' teaching enthusiasm. The selection of evaluation indicators should be built around this purpose.

The consistency principle, refers to the scientific, standardized, systematic selection online teaching quality evaluation index, evaluation index based on different levels ofinstitutions of higher learning online teaching law, conform to the characteristics of the institutions of higher learning education at every level, combining with the characteristics of college students, curriculumto determine evaluation index weights, and talents training target, institutions of higher learning education goal is consistent.

The principle of comprehensiveness requires that the evaluation indicators of online teaching quality should cover all the factors that affect the quality of online teaching, and should not be limited to certain aspects and indicators.

The principle of operability requires that the evaluation system of online teaching quality should be based on reality, practical and feasible, and can be carried out continuously and effectively in a large range.

3.2 Subject of teaching evaluation

The core of online teaching quality evaluation is teaching quality. Based on the existing research on offline teaching quality evaluation and combined with the characteristics of online teaching, this study takes teaching management departments, teaching supervisors, secondary colleges, students, and teachers as the subjects of online teaching quality evaluation.

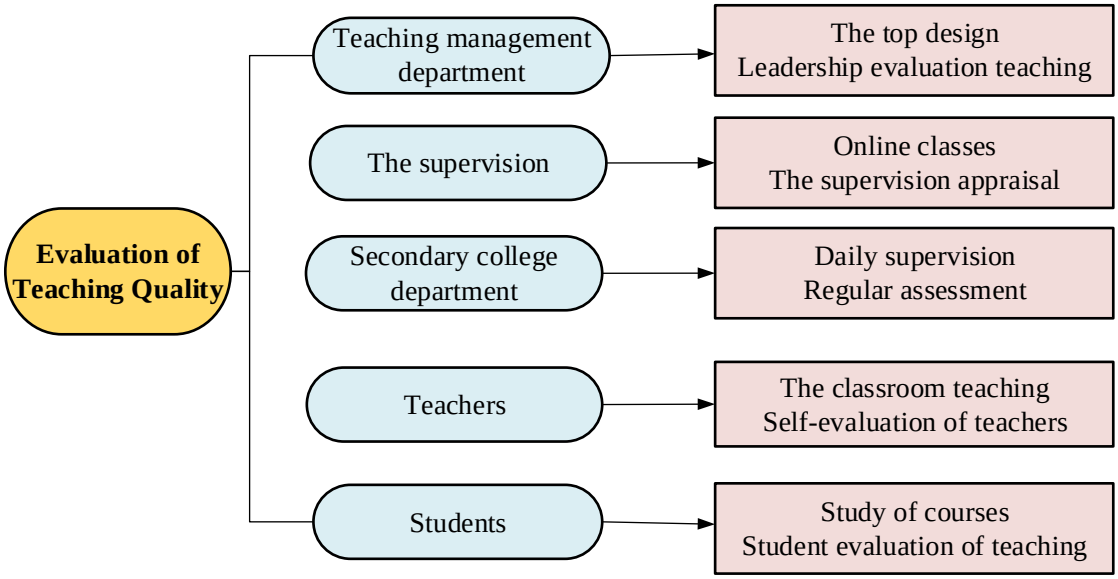

Figure 1: Five-dimensional online teaching quality evaluation system

Teaching evaluation by teaching management departments. For improving the quality of online teaching, college educational administration departments, various professional director, director of the teaching and research section, etc., should be prepared for the top-level design, on the basis of professional, set up a leading group for teaching quality evaluation, classification guidance of various professional courses, and arrange for online demonstration public class teaching activities, and then listening to lectures, evaluation.

Supervision and evaluation of teaching and teachingevaluation of secondary colleges. The online teaching supervision group of the two levels of the university and college will conduct online lectures and comment on the teaching teachers, and give the corresponding evaluation results.

Teachers' self-evaluation. Teachers are encouraged to take an active part in the online demonstration open classes in the teaching and research department. Teachers can communicate and discuss with their own online teaching situation and give comments.

Students' evaluation of teaching. The teaching effectinformation of students' feedback is a very important reference for the quality of online teaching.Certain evaluation indexes can be set by specialty, and the teaching evaluation of all online courses can be collected by means of questionnaire.

3.3Teaching evaluation index system

The evaluation of online teaching quality emphasizes that both process evaluation and process and result evaluation should be equal. Based on the principle of whole-process element evaluation, this study designed evaluation indexes for each evaluation subject based on existing research.

Online teaching activities are organized by teachers and participated by students.As the main managers and supervisors of online teaching in colleges and universities, teaching management departments mainly evaluate teachers' online behaviors and students' online learning behaviors, which can be obtained based on the background management of online platforms.Teaching supervisors mainly evaluate the implementation of online classroom teaching, including teaching design, teaching process, teaching effect, and teaching resources.As participants of online teaching, students were evaluated from four aspects: teaching content, teaching method, teachingeffect,andteachingattitude,consideringthe characteristics of students' limited self-knowledge level.As the supervisors of online teaching, secondary colleges focus on the daily supervision of online teaching by teachers, and the evaluation Angle includes teaching materials, assessment process and teaching routine.Teachers are the organizers of online teaching. Teacher self- evaluation can help teachers find their shortcomings and improve themselves constantly, and stimulate teachers' enthusiasm. Teachers' self-evaluation should be carried out according to the principles ofpreparation before class, implementation in class and feedback after class.In this study, a total of 16 evaluation indicators were set for the evaluation subjects, as shown in Table 1.

This paper weights the evaluation indexes based on analytic hierarchy process (AHP).First of all, according to the online teaching quality evaluation index system, the target for quality assessment of online teaching evaluation layer, criterion layer includes teaching evaluation, teaching supervision management department assessment, evaluation, evaluation of secondary school students and the teachers' self-evaluation, scheme for evaluating indicator of evaluation subject, evaluation layer structure model to build pass class times;Secondly, 10 experts were consulted and analyzed on the relative importance of pairwise comparison between evaluation subjects and evaluation indicators, and the comparison judgment matrix was constructed.Thirdly, the consistency test was carried out, and the results showed that the CR of each judgment matrix was less than 0.1, which all passed the test.Finally, the weight of online teaching quality evaluation index is calculated, and the calculation results are shown in Table 1.

Table1:Onlineteaching qualityevaluation indexand weight

Subject of evaluation	The weight	The evaluation index	The weight	Comprehensive weights
Teaching management department	22%	Teacher behavior performance Student behaviorperformance	50% 50%	11% 11%
The supervision	18%	Teaching design Teaching process Teaching effect Teaching resources	15% 50% 25% 10%	2.7% 9.0% 4.5% 1.8%
Students	35%	Teachingcontent Teachingmethod Teachingeffect Teachingattitude	20% 25% 45% 10%	7.0% 8.8% 15.8% 3.5%
Secondary college department	14%	Teaching materials The assessmentprocesses Teachingroutine	61% 27% 12%	8.5% 3.8% 1.7%
Teachers	11%	Readiness toteach Teachingimplementation Teachingfeedback	60% 20% 20%	6.6% 2.2% 2.2%

Data source: Calculated in this study.

3.4 Learning evaluation index

The evaluation of course learning quality is the core of online teaching. The purpose of learning evaluation is to improve teaching and learning, and it should run through the whole learning process.The diagnostic evaluation of learning quality should observe, interpret, and feedback the information flow and behavior trajectory in the "teaching" and "learning" activities, and conduct a multivariate evaluation based on the learning process data.

Based on the characteristics of online teaching and onlinelearners, this study constructs a theoretical model of "five- dimensional integration", as shown in Figure 2. The model is composed of dimensions and indicators, among which the dimensions mainly meet the evaluation needs of students in a certain aspect, with a certain degree of generalization and abstraction, and it may contain multiple indicators.The index is the specific decomposition of the dimension.

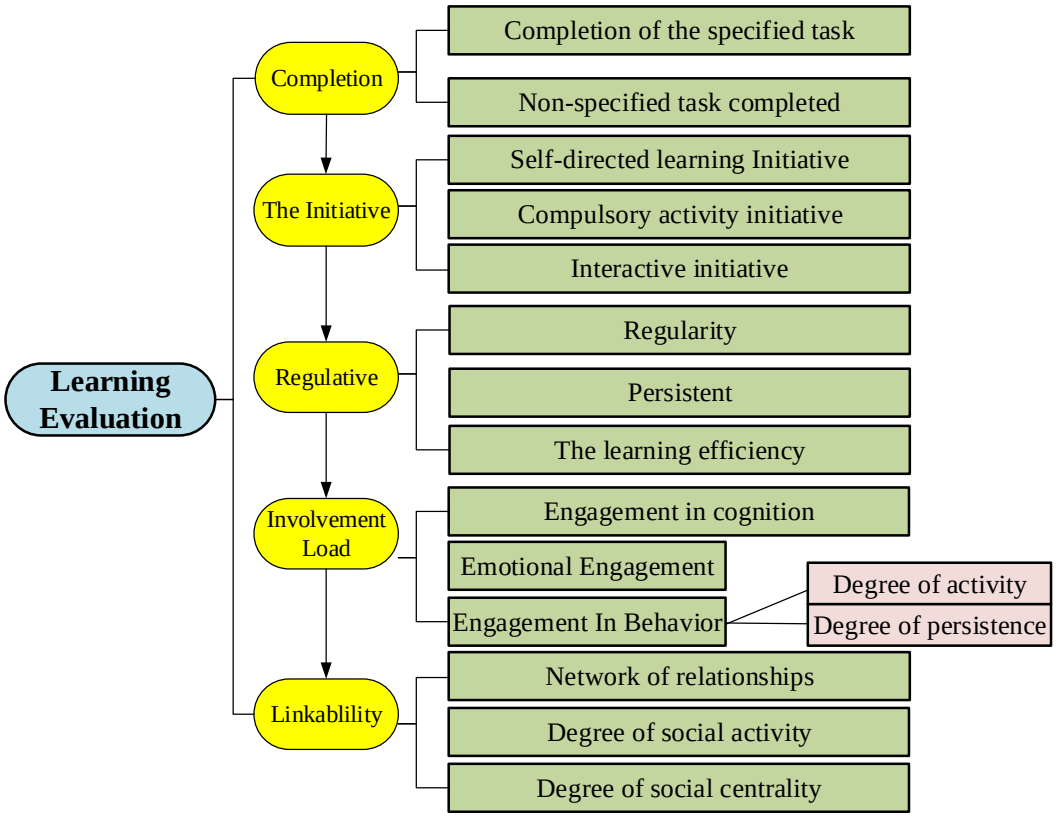

Figure2: Five-dimensional integrated learning evaluation system

Investigation and analysis of online teaching status and empirical test

4.1 Basic information of respondents

To truly understand the current situation of online teaching, this study designed a questionnaire and conducted a survey among students in colleges and universities in the province.A total of 395 college students participated in this survey, including 112 male students and 283 female students.The students who participated in the survey were mainly from the students of Grade 2020 and 2021. The surveyed students are students from more than 20 universities in more than 10 cities in Shandong Province. The main sources are as shown in the figure below.

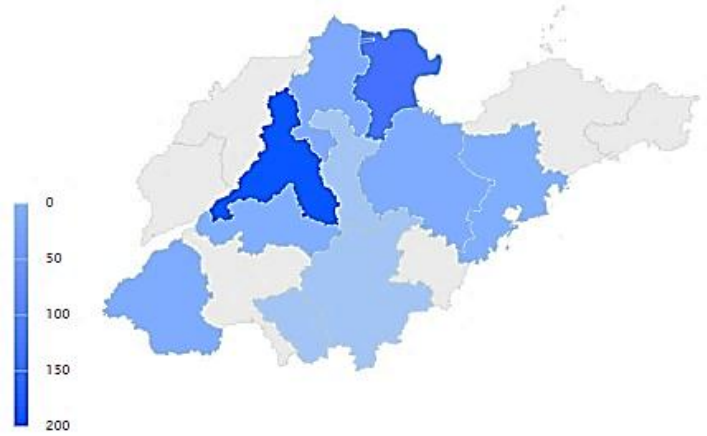

Figure 3:The geographical sources of the surveyed students

4.2 Basic information of teaching evaluation

4.2.1. Teaching effect

For the effect of online teaching,239 students (more than 60%) thought that the effect was like that of offline teaching, while more than 30% thought that the effect could not be achieved, and only 36 students (9.11%) thought that the effect exceeded that of offline teaching.67.34% of the students think that they have gained more from the current courses.The students are relatively satisfied with the arrangement of online teaching by the school and teachers, only 1.27% of them think that they are not satisfied.As for the main reasons affecting the effect of online teaching, 226 students (57.22%) thought that the main reason affecting the effect of online teaching was the limitation of network and hardware conditions, and 49.37% of students found problems from internal causes, thought that the lack of self-discipline and the lack of autonomous learning ability.

Table 2: Survey results of the main reasons affecting the effect of online teaching

Options	**The number**	**The proportion**
Network and hardware constraints	226	57.22%
Insufficient classroom interaction	170	43.04%
Not adapted to online teachingmethod	116	29.37%
They are not self-disciplinedand lack the ability to learn independently	195	49.37%
Teachers' online teachingskills and methods are insufficient	41	10.38%
Other	68	17.22%
The question was filled ineffectively	395	

About whether the teaching content coherent logic, homework arrangement is reasonable, supplementary materials after the situation whether reasonable, the online teaching materials for preview before class or after class to review whether useful, online courses and printed textbooks harvest more 5 questions about the course content involves, most of the respondents think that is reasonable.

4.2.2. Regression analysis of the effect of online teaching

SPSS software is used for statistical analysis of several factors affecting the teaching effect. It is found in this study that the regression analysis of "whether the online teaching arrangement is satisfactory or not" shows that the p value is less than 0.01, indicating that this is the main factor affecting the teaching effect. However, the P value of "whether the teaching content is organized and logical" was 0.945, and the statistical results such as the arrangement of homework after class and the supplement of extracurricular materials were not significant, indicating that this is not the main factor affecting the teaching effect, which is worth reflecting on in the arrangement after online teaching.

Table 3: Regression analysis of online teaching effect evaluation

Project	Regressioncoefficient	T	P	VIF
Constant	1.08	4.27	0.000 **	-
Are you satisfied with the online teaching arrangement?	0.21	2.87	0.004 **	1.26
Is the teaching content organized and logical?	0.01	0.07	0.945	1.35
How is homework assigned after class?	0.09	0.86	0.393	1.01
What about the supplement of extracurricular materials?	0.09	1.26	0.21	1.01
Do you think online teaching materials are useful for you to preview before class or review after class?	0.1	1.29	0.199	1.2
Sample size	395			
R squared	0.041			
Adjust the R squared	0.029			
F	F (5389) = 3.363, p = 0.005)			

Description: * p<0.05 ** p<0.01

4.2.3. Students' demands

Regarding the question of what kind of resources students prefer in the learning process, 127 students think text materials, accounting for 32.15%; 101 students think video recordings of lectures, accounting for 25.57%; 167 students think video and audio materials and charts related to the course content, accounting for42.28%. Each option is selected by more than 100 people. Students have their own preferences for learning resources, which should be perfected as much as possible in online teaching.As for the survey on what aspects teachers should pay attention to in the online course content, 60.51% of the respondents think that they should focus on the key and difficult points of the examination, which reflects the students' misunderstanding of exam-oriented education and is also the focus of the future teaching reform.

4.3 Basic situation of learning evaluation

4.3.1. Learning effect

Students' overall evaluation of their learning effect during online learning.230 students were satisfied, accounting for 58.23%, while 3 students were not satisfied, accounting for 0.76%.About the situation, will participate in the teaching interaction has been learning about online content for review or review, students complete homework, learning in the process of taking notes, students learning objectives and learning plan, online class process will be distracted from the student and so on six questions about learning motivation, The survey of this study found that the vast majority of students are positive and positive, but there are still many students need to improve the situation.

4.3.2. Regression analysis of students' self-evaluation of online learning effect

SPSS software was used for statistical analysis of several factors affecting students' learning effect. It was found that students' participation in teaching interaction and review of learning content were significantly affected by regression analysis, indicating that these factors were the main factors affecting students' learning effect. The P values of completinghomework and taking notes were 0.92 and 0.942, respectively. The statistical results were not significant, indicating that this was not a factor affecting the learning effect.Whether to make learning goals and learning plans in class, and to review and organize after class are also correlated with learning effects.

Table 4: Regression analysis of students' self-evaluation of online learning effect

Project	**Regression coefficient**	**T**	**P**	**VIF**
Constant	0.24	2.31	0.022 *	-
What about participation in teaching interactions?	0.53	12.5	0.000 **	1.33
Will there be any review or review of what has already been learned online?	0.17	3.83	0.000 **	1.52
The situation with homework completed?	0.01	0.1	0.92	1.04
Do you make learning goals and plans in class and review them after class?	0.12	2.51	0.012 *	1.56

Do you often take notes while studying?	0	0.07	0.942	1.38
Sample size	395			
R squared	0.474			
Adjust the R squared	0.467			
F	F (5389) = 69.985, p = 0.000)			

Description: * p<0.05 ** p<0.01

4.3.3. Existing problems and difficulties

In the process of online learning, students have a great degree of bad learning behaviors. For example, 255 students have inattention, accounting for 64.56%; 135 students watch websites and videos unrelated to learning, accounting for 34.18%; 149 students receive and read information unrelated to learning, accounting for 37.72%.

In addition, 7.85% of students played online games unrelated to the learning theme, and only 25.32% (100 students) did not have the above behaviors.The main difficulties in online learning were network problems (175 students, accounting for 44.3%) and lack of textbooks and handouts (162 students, accounting for 41.01%).In addition, there were 87 people (22.03%) without proper electronic equipment, 99 people (25.06%) were not familiar with the use of online teaching software, 116 people (29.37%) had not mastered the characteristics of online teaching, and they were not adapted to online teaching, and other reasons (77 people (19.49%)). It is necessary to help students overcome them one by one in their future work.

4.4 Cross-analysis of online teaching evaluation

In terms of the effect and satisfaction of online teaching, there are significant gender differences, and male students have relatively high recognition of online teaching.For example, the proportion of male students who think that offline teaching cannot achieve the effect is 27.68%, which is lower than that of female students (31.45%).The proportion of male students who think online teaching is better than offline teaching is 17.86 percent.It was significantly higher than that of girls (5.65%).Male students' satisfaction with online teaching arrangement was 71.43%, which was significantly higher than female students' 61.84%.It shows that male students can adapt to online teaching better.In addition, female students are also significantly lower than male students in terms of the harvest of current courses and the overall evaluation of self-learning effect.

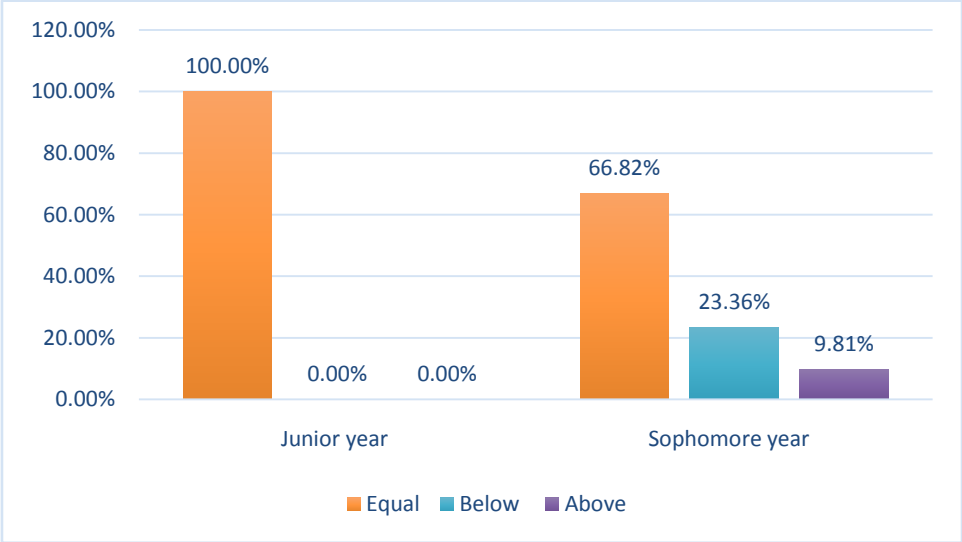

Figure 4: Gender difference in the effect of online teaching

In terms of the effect and satisfaction of online teaching, thereare significant differences among grades. The higher the grade, the higher the recognition of online teaching.For example, the proportion of students of grade 2021 who think that offline teaching effect cannot be achieved is 39.55%, which is significantly higher than that of grade 2020 (23.36%) and grade 2019 (0%).The degree of satisfaction of the students of Grade 2021 with online teaching arrangement is 56.%, which is significantly lower than 70.56% of the students of grade 2020 and 100% of the students of grade 2019, indicating that the new students cannot adapt to online teaching well, and measures should be taken to improve the adaptability of students. In addition, according to the harvest of the current courses and the overall evaluation of self-learning effect, the grade 2021 students are also significantly lower than the grade 2020 and 2019 students.

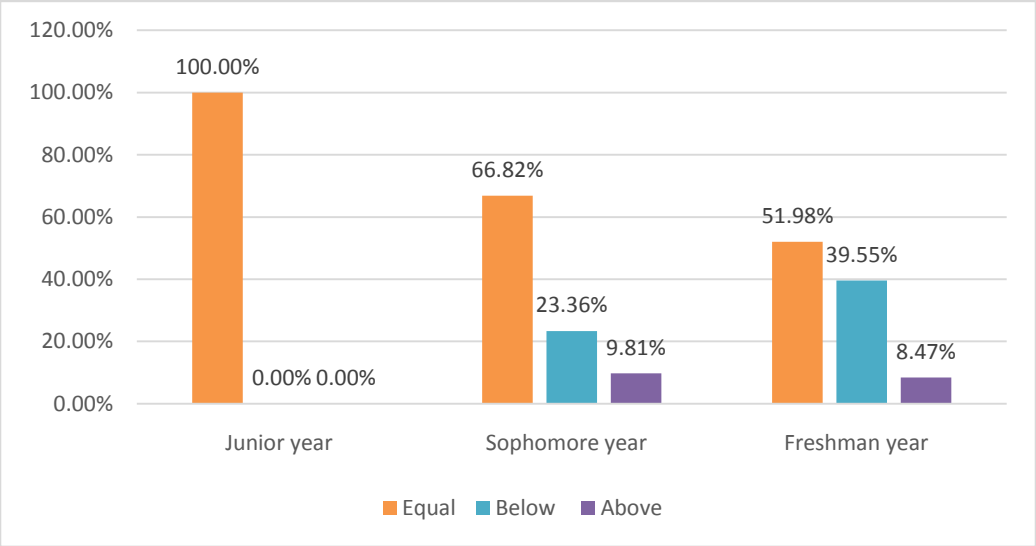

Figure 4: Grade differences in the effect of online teaching

4.5Test ofonline teaching course learning quality evaluation system

In this study, the course "Principles of Economics" of Shandong Youth University of Political Science was selected as an example, and the information management class of 2020 and financial management class of 2020 were selected as the research objects (a total of 381 students). With Chaoxing Learning Tong as the research platform and big data analysis technology, the learning behaviors of students such as "online resource access times, video viewing time, homework scores, discussion times and test scores" were tracked and recorded, and the characteristics were analyzed. According to the analysis results, the teaching was objectively evaluated, the teaching methods were adjusted in time, the teaching content was optimized, and personalized counseling was provided for students.

Practice has proved that the hybrid teaching model based on big data analysis of learning behavior has a good effect in the teaching process of "Principles of Economics".On the one hand, through the results of big data analysis, teachers can understand each student'slearning behavior and grasp of knowledge points, to dynamically adjust the teaching schedule and methods, carry out personalized teaching, and improve the pertinence and orientation of teaching.Teacher, on the other hand, through the large data analysis results, to learn is the overall situation of mastering knowledge of class, students can understand not enough thorough knowledge as a difficult point, in the process of offline teaching in-depth interpretation, so as to deepen the student to the knowledge internalization, to strengthen the guiding role in the process of teachers on students' knowledge construction.

The practice of this study shows that the use of learning analysis technology to form a systematic learner evaluation model can partially replace the traditional evaluation design.One of the reasons for this partial replacement is that learning analysis techniques rely heavily on the availability of data.From an ideal design perspective, researchers would like to have access to all student-related data to provide a deeper and more comprehensive interpretation of online learning.The practical application of this study largely proves the scientific and validity of the model based on learning analysis, which can provide support for the improvement of teaching and learning services in online education.

V. Countermeasures and Suggestions

In the construction and application of online teaching quality evaluation index system, we should ensure that online teaching forms a virtuous cycle system of "evaluation -- feedback -- improvement -- reevaluation", to realize the effective combination of teaching evaluation and later teaching improvement and improve teaching quality.In addition, colleges and universities at different levels should consider many factors, such as the setting of onlinecourses, teaching methods, and the quality of students, when constructing the online teaching quality evaluation system. In this regard, this study puts forward the following countermeasures and suggestions in the construction of online teaching quality evaluation index system.

5.1 Optimize the evaluation index system and determine the scientific and diversified evaluation methods

5.1.1. Optimize the online evaluation index system

Through surveys and interviews, the suggestions of students, teachers, supervisors, peers, management departments and other teaching evaluation subjects on the online evaluation index system are understood. According to the feedback opinions, the index system of online teaching evaluation is further optimized from the aspects of evaluation indicators, dimensions, observation points, and evaluation subjects. The evaluation standards of online teaching quality were formulated from the aspects of preparation of teaching (learning) resources, curriculum design, teaching organization, teaching attitude, teaching level, learning effect, etc.

5.1.2. Determine scientific and reasonable diversified evaluation methods and evaluation weights

Diversified evaluation methods rely on diversified evaluation subjects, including student evaluation, supervision evaluation and peer evaluation. On this basis, teachers' self-evaluation is added to make the evaluation subjects more diversified and the evaluation results have more ideal validity.In addition, the weight coefficients of the evaluation methods should be reasonably allocated.

5.1.3. Reasonably determine the diversified evaluation content and elements

The content and weight of the evaluation should be designed based on different evaluation subjects. According to the characteristics of the subject, a comprehensive, multi-dimensional and comprehensive evaluation of teachers' online teaching can be achieved through a variety of evaluation subjects.

5.1.4. Improve the relevant system of online teaching quality evaluation

Colleges and universities should earnestly perform the management function of online teaching, establish a management mechanism adapted to online teaching, give play to the maximum effect of flexible strategies of developmental evaluation and rigid strategies of reward and punishment evaluation, and constantly strengthen the construction of relevant systems of online teaching quality evaluation.Relevant departments of colleges and universities should introduce corresponding online teaching quality evaluation management methods, form a normal online teaching evaluation system, and run through the whole process of online teaching, to provide a strong institutional guarantee for the online teaching quality evaluation system, evaluation standards and operation mechanism.

5.2 Timely feedback of teaching evaluation results

For the construction of online teaching quality evaluation index system, it is not only necessary to achieve the multi-dimensional and whole-process evaluation of online teaching, but also to achieve the effective unification of teaching evaluation and tracking improvement mechanism.It is worth noting that the multi-dimensional evaluation of teachers should be carried out from the aspects of students, peers, supervisors, and leaders.At the same time, the application of tracking and improvement mechanism should meet the teaching needs of specific majors, so as to build a virtuous cyclemode of "evaluation, feedback, improvement and re-evaluation" and promote the orderly development of college education and teaching.

5.3 Make reasonable use of big data analysis technology to evaluate the quality of online teaching

5.3.1. Pay attention to data collection in the process of online teaching

The whole and all-round monitoring of online teaching and real- time collection of process data is the basis of online teaching quality evaluation, which can create favorable conditions for the selection of teaching quality evaluation indicators and the construction of the system.Online teaching includes two aspects: teaching and learning. To ensure the high teaching quality of online teaching, the whole process of teaching and learning should be monitored in the teaching practice, and the information of teachers' teaching attitude, content, ability, and effect should be systematically collected. Meanwhile, the performance of students in teaching should be considered.

5.3.2 Make reasonable use of big data analysis technology

Big data analysis technology should be used to mine the internal correlation between learning behavior data, analyze the internal relationship between students' learning behavior and learning effect, upgrade meaningless data into teaching information that is helpful for teachers to "evaluate and guide learning", to optimize the learning process and improve the teaching effect.

5.4 Multi-subject linkage, joint management, jointly do a good job of online teaching quality evaluation and monitoring

Online teaching quality evaluation mainly relies on the network. To ensure the quality of online teaching, school leaders, teachingmanagement departments, teaching and research offices, secondary colleges, teachers, supervisors, and students need to attach great importance to each other, cooperate with each other, coordinate with each other, and jointly manage the online teaching quality evaluation and monitoring.In view of the problems in online teaching quality evaluation, the teaching affairs office of the university and the relevant teaching management departments of secondary colleges should further improve the policy support of online teaching quality evaluation, innovate teaching management, and create multiple opportunities to organize teachers and students to discuss and exchange teaching evaluation results.

5.5 Keep pace with The Times and constantly improve the online teaching qualityevaluation system

Colleges and universities should make full use of the historical data generated by the platform and the questions of teachers and students' survey feedback, and adopt statistical methods to revise and constantly improve the online teaching quality evaluation system.In terms of evaluation subjects, students should be the main body, supervisors, teachers, and peers should be combined with comprehensive evaluation;In the index dimension of evaluation, the content and weight of the first-level index and second-level index were set up scientifically, and presented to teachers and students in the form of grade evaluation.In terms of the evaluation content, it is mainly designed according to different subjects in terms of teaching resources, curriculum design, teaching organization, teaching attitude, teaching level, learning effect and so on. In terms of evaluation methods, qualitative evaluation and quantitative evaluation are combined, process evaluation and result evaluation are integrated, "teaching" evaluation and "learning" evaluation areunified, pre-evaluation mobilization and post-evaluation feedback are closely combined, and a more complete online teaching quality evaluation system is constructed.At the same time, through the system innovation, concept innovation, system innovation, method innovation and content innovation of online teaching quality evaluation system, to improve the quality of online teaching, better for the management department to supervise the quality of online teaching and learning effect to provide a guarantee.

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