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Practice and Reflection of "N+2" Assessment Mode

Taking the Course of "Cargo Transportation Organization" as an Example

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***Abstract*—With the development of economy and society, the demand for applied talents is becoming more and more urgent. Domestic universities have also adjusted the mode of talent training according to the market demand for talents. The reform of the assessment mode is also an important link. The traditional assessment mode can no longer meet the needs of applied talents training. It is necessary to explore the evaluation methods suitable for cultivating applied talents, which is conducive to the improvement of teaching quality, the combination of process evaluation and final evaluation, and then promote learning by evaluation. This paper takes the "Cargo Transportation Organization" course of logistics engineering as an example, introduces the "N+2" assessment mode, expounds the "N+2" assessment reform, introduces the assessment content and the specific implementation process, and conducts the effectiveness analysis of the assessment results, summed up the current problems of the assessment mode, and proposed a solution.**

Keywords*— *"N+2" assessment mode; Cargo transportation organization; Assessment mode reform; Practice and reflection

I. INTRODUCTION

The "N+2" course assessment is a non-traditional course assessment mode adopted by colleges and universities. It refers to the course assessment plan, which includes N times process evaluations conducted during the course of teaching and 2 times after the course [1]. In the general evaluation, each part of the evaluation scores must have a certain weight in the total score of the course assessment. Among them, "N" refers to the number of process assessments during the teaching activities. The assessment forms include unit test, chapter summary, class discussion, extracurricular innovation activities, case analysis, design, experimental report, etc. [2]. The proportion of the scores of each part can be determined by the course leader (team) according to the characteristics of the course. The value of "N" is generally between 3 to 5. "2" indicates that there are two necessary assessment methods for the implementation of the assessment reform course, one of which is the final exam, and the other is the study notes assessment or course summary. In order to reflect the importance of process assessment, the "N"part assessment score usually accounts for about 50% of the total score.

II. THE NECESSITY OF "N+2" ASSESSMENT REFORM

The traditional course assessment usually consists of three parts: attendance, homework and final exam. The content of the assessment focuses on the memory of knowledge, and lacks a powerful assessment program for the practice and application of knowledge. At the same time, in the total scores of the course, the weight of the final exam results is much too large, which makes some students do not study at ordinary times, relying only on the short review before the exam. We must admit that this traditional assessment mode can urge students to remember and master the basic knowledge of the curriculum. However, the evaluation of talents in today's society is more dependent on their ability to learn, the ability to use knowledge comprehensively and the ability to innovate. Therefore, according to the property of the curriculum, different assessment modes should be adopted to increase the proportion of process assessment, and urge students to think more and communicate more in their usual learning, finally give full play to students' creativity and subjective initiative. In this way, we can adapt to the needs of society for applied talents.

Compared with the traditional course assessment method, the "N+2" assessment has the following advantages:

- "N+2" assessment will establish a diversified curriculum evaluation system, which comprehensively examines students' memory, mastery and application of knowledge in practice, and also trains their comprehensive ability in expression and teamwork. After adopting this mode, teachers can effectively promote learning through assessment, and cultivate students' ability in all aspects during the teaching process [3].
- Emphasis on process assessment. Under the "N+2" assessment mode, students' classroom performance, such as the correct rate of answering questions, class discussion, group work and program design, will have an impact on the final assessment results. The final assessment results are no longer just linked to the final exam. This assessment method will greatly improve the fairness of the assessment.
- Under the "N+2" assessment mode, course teaching is no longer a traditional "duck-filling" teaching, but enhances various forms of classroom interaction. Students' autonomy and enthusiasm would be improved, which is conducive to cultivating their comprehensive ability, to make them closer to the needs of applied talent.

III. PROCESS AND CHARACTERISTICS OF THE "N+2" COURSE ASSESSMENT OF "CARGO TRANSPORTATION ORGANIZATION"

The "Cargo Transportation Organization" is a major required course for logistics engineering profession with a total of 32 class hours. This course has strong practicality for students majoring in logistics engineering and requires students to have a comprehensive understanding and their own opinions of the transportation system and transportation organization [4]. This feature of the course makes the traditional end-of-session closed-book exam not a comprehensive assessment of whether the students really have mastered the knowledge acquired during the course and can use them comprehensively in practice. Therefore, it is necessary to reform the assessment system of this course and strengthen the intensity of process assessment.

The course assessment is conducted in the form of "N (classroom test + case discussion + program design) + 2 (note assessment + final assessment)". The five assessment modules accounted for 15%, 15%, 20%, 10%, and 40% of the final results. The assessment objectives, assessment contents and scoring criteria of the five modules are as follows:

A. Classroom Test

1) Purpose of Assessment

The classroom test module assesses students' mastery of the course's basic knowledge by publishing exercises on the "teachermate" platform. The scoring indicators mainly include the correct rate and the speed of answering questions. This part mainly assesses the basic knowledge of each chapter [5].

2) Content of Assessment

The assessment content of this module includes: the mastery of the basic knowledge of cargo transportation organization, such as transportation demand, transportation mode, transportation rationalization and so on.

3) Scoring Criteria of Assessment

This module scores 15% of the final grade.

The scoring standard is basically consistent with the scoring method of the classroom practice on the micro-teaching platform, and scores from the speed of answering questions and the correct rate of answering questions. The specific criteria are as follows.

The speed of answering the questions is in the top ten and the answer is correct, counting 10 points; the speed is outside the ten and the answer is correct, 9 points; the answer is wrong, 2 points; no answer, 0 points.

B. Case Discussion

1) Purpose of Assessment

In the implementation of this module, the teacher will select the case from the textbook, the network or the reality, and then divide the students into groups to discuss the case, and score through the discussion speech in the class and the discussion record submitted after class [6]. This module is designed to train students' comprehensive analysis and application of knowledge.

2) Content of Assessment

The assessment includes: case studies of transportation organizations, thinking and expressing skills, teamwork and the division of labor in a group.

3) Scoring Criteria of Assessment

This module scores 15% of the final grade. The case discussion will be conducted three times during the course. The total score is the average of three grades, and the students of each group who speak as a representative will be added by one point in their total score.

The case discussion scoring criteria are shown in Table I.

C. Program Design

1) Purpose of Assessment

The program design module will divide the students into several groups, and requires the teams to optimize the transportation organization process for the logistics and transportation organization problems under actual circumstances, then complete a design report about logistics transportation organization plan and conduct PPT reply. Teachers will rate each team based on the design they submitted and the performance of the response. The module mainly trains students' ability to build models based on actual transportation problems, analyze and solve the problems about transportation organization optimization.

2) Content of Assessment

The content of the program design module includes: establishing a transportation organization optimization problem model, using the shortest path method, saving mileage method, table operation method, etc. to solve line optimization problems, writing a program design report, PPT production and reply, teamwork and the division of labor in a group and so on.

3) Scoring Criteria of Assessment

This module scores 20% of the final grade.

The total program design score is equal to 60% of the program design report score plus 40% of the PPT score.

TABLE I. SCORING CRITERIA FOR THE MODULE OF CASE DISCUSSION

Grade and score	Scoring standard
Excellent (90-100 points)	There is a group representative to state the results of the discussion; the discussion record is detailed and organized, and the opinions expressed are somewhat innovative and prominent.
Good (80-89 points)	There is no group representative to state the results of the discussion; the discussion record is detailed and organized, and the opinions expressed are somewhat innovative and prominent.
Medium (70-79 points)	There is no group representative to state the results of the discussion; the discussion record is detailed and organized.
Pass (60-69 points)	There is no group representative to state the results of the discussion; the discussion record is not clear.
Failed (under 60 points)	There is no discussion record.

a) Program Design Report

The scoring criteria of the program design report are shown in Table II.

b) PPT

The scoring criteria of the PPT are shown in Table III.

TABLE II. SCORING CRITERIA FOR THE PART OF THE DESIGN REPORT

Grade and score	Scoring standard
Excellent (90-100 points)	The report has a clear idea and a standardized format; the selected transportation scenario is reasonable and the data is completely correct; the model is established correctly, the solution process is complete and clear; the method of transport organization optimization is skilled; there is certain innovation in the report.
Good (80-89 points)	The report has a basic clear idea and a relatively standardized format; the selected transportation scenario is reasonable; the model established is basically correctly, the solving process is complete; and the method is relatively skilled.
Medium (70-79 points)	The report format has some minor problems, but it is generally standardized, and the idea is basically clear; the selected transportation scenario is basically reasonable; the solving process is not clear; the application of methods is not skilled enough.
Pass (60-69 points)	The report format has obvious errors, and the ideas are not clear enough; the solving process is incomplete; the method of transport organization optimization cannot be skillfully used.
Failed (under 60 points)	The report format is obviously wrong, the idea is not clear; the selected transportation scenario is unreasonable; the model is basically correct, but there is no solution process; there is no way to master the transportation organization optimization. Or the report is suspected of plagiarism.

TABLE III. SCORING CRITERIA FOR THE PART OF THE PPT

Grade and score	Scoring standard
Excellent (90-100 points)	The PPT is rich in content, with clear emphasis and very good detail description, novel ideas and beautiful layout. Team members cooperate well with each other. The explanation has rigorous logic, strong persuasiveness, fluent verbal expression, as well as natural facial expression.
Good (80-89 points)	The PPT is relatively rich in content, with clear emphasis and relatively good detail description, certain new ideas, and qualified layout. The explanation has certain logic, clear articulation and natural expression.
Medium (70-79 points)	The content of PPT is general, and the focus is not prominent. There are certain new ideas, but the layout is not good enough. The explanation has certain logic and clear articulation, but the expression is not natural.
Pass (60-69 points)	The content of PPT is general, and the focus is not prominent. There is no innovation, no typesetting in the PPT. The explanation of PPT is not smooth.
Failed (under 60 points)	The content of PPT is copied from the design report and is not summarized. The explanation of PPT is not smooth.

D. Note Assessment.

After the course is completed, the students will hand over the study notes to the class teacher for review. The teacher will score the notes according to the content of the notes. This module scores 10% of the final grade.

E. Final Assessment.

This module assesses the mastery and application of the course content. This module scores 40% of the final grade.In addition to set up the process assessment module in accordance with the relevant requirements of the school, the "N+2" assessment of this course has also adopted a mobile teaching tool called "teachermate". Especially in the test part, students can answer questions on the "teachermate" platform. Teachers can observe the students' questions in real time on the PC side, and even the correct rate of each question, the distribution of questions and answers. This method greatly optimizes the teaching effect, and students also like this new teaching method.

IV. ANALYSIS OF THE RESULTS AND EFFECTS OF THE "N+2" ASSESSMENT

The "N+2" assessment of "cargo transportation organization" is mainly aimed at the grade 2015 students majoring in logistics engineering of the School of Logistics in Wuhan Technology and Business University. The assessment results and effects are as follows:

A. The Impact of "N+2" Assessment on Test Paper Scores

The teachers sorted out the test scores of grade 2015 students and compared them with the grade 2014 who does not adopt the "N+2" mode. The results showed that the pass rate of final exam papers of the grade 2015 students increased to 100% compared with the grade 2014, and the average score of the final exam paper increased by nearly 5 points. The comparison of the results of grade 2014 and 2015 students' final exam papers is shown in Table IV.

B. The Impact of "N+2" Assessment on Usual Performance

In the part of the usual performance, after the implementation of the "N+2" assessment, the classroom participation and classroom performance of the grade 2015 students were quantified through the assessment of the classroom test, case discussions and program design. Compared with the traditional assessment method, the usual performance scores under the "N+2" assessment have a more obvious distinction, showing a typical normal distribution, indicating that after the "N+2" reform, the students' abilities have been evaluated more comprehensive and objectively, avoiding the situation of some students just to make up the number in the traditional assessment mode.

TABLE IV. COMPARISON OF THE RESULTS OF THE FINAL EXAM PAPERS

Index \ Grade	Grade 2014	Grade 2015
The average score	73.2	77.8
The passing rate	89.5%	100%

C. The Impact of "N+2" Assessment on Teaching Effect

Under the traditional teaching mode, although the student attendance rate is very high, there is still part of students just stay in the classroom but do not listen to the teacher. It can be seen that the attractiveness of the classroom under the traditional teaching mode needs to be improved. After the implementation of the "N+2" assessment mode, students are more serious in their course and their enthusiasm for learning has improved. Among them, the classroom test completed with the help of "teachermate" platform is very popular among students because of its novel form. The case discussion module divides the students into groups to discuss the relevant cases of each chapter. The students' thinking and expressing skills (oral and written) were exercised. In the program design module, in order to complete the task better, many groups consulted the literature to learn some extracurricular knowledge, and communicated actively with the teacher after the class. In the end, most of the results submitted by the groups are quite satisfactory.

V. EXISTING DEFICIENCIES AND IMPROVEMENT MEASURES

After one semester of practice, the "N+2" assessment method for the course of "cargo transportation organization" has achieved good results, but some problems have been found in the implementation process and need to be solved.

A. Insufficient Participation of Individual Students

Program design and case discussions are usually carried out in small groups. In particular, in the program design module, the program results are scored according to the group, there is no evaluation based on individual performance, and lack of personal evaluation indicators in collective work. Solution: Establish self-assessment and mutual evaluation indicators and evaluate according to indicators, and eliminate the phenomenon that individual students do not participate in the homework. The evaluation indicators include six aspects: task participation level, communication and cooperation ability, problem solving ability, reflection ability and method application, so as to evaluate the students' collective work [7]. Among them, the personal assessment accounted for 15% of the total program design score, and the internal evaluation of the group was set at 25%.

B. Process Assessment Has a Certain Impact on the Original Course Progress

Solution: Adjust the schedule of the original course. For example, the classroom practice and case analysis part of the original course arrangement can be integrated with the "N+2" process assessment; for some non-difficult points, the teaching progress can be accelerated or the self-study under the class can be arranged.

C. There is No Guarantee that Each Group Have the Chance to Speak Every Time in the Case Discussion Module

Solution: Teachers can make plans in the course design stage to ensure that each group has 1-2 speaking opportunities in the whole process of the module evaluation. When formulating the module's scoring standard, we should consider the situation of the speech and the record of the discussion, try to ensure fairness. In addition, we can use the "teachermate" platform to ask students to input the content of the discussion directly in the chat input box during the discussion process, so that students who do not have the opportunity to speak can also express their opinions in real time, and the teacher can also count the discussion of the students [8].

VI. CONCLUSION

Teaching and assessment reform is the essential way in the development of higher education institutions. In this paper, the author conducted the "N+2" evaluation mode in her own teaching course. In the process of practice and reflection, the following conclusions were drawn:

- After theoretical research and one semester's practice, it proves that the "N+2" assessment reform can indeed assess students' mastery of the curriculum more reasonably and comprehensively, and also help to improve the quality of teaching. This mode of assessment is worth further promotion in more courses.
- The "N+2" assessment mode adopts group work forms such as discussion, design and PPT reply in the learning process, which is prone to some problems such as insufficient participation of individual students and incompleteness of the scoring standard. These problems need to be improved in the future practice.
- In order to apply the "N+2" assessment mode better, more innovative teaching methods such as the mobile teaching platforms are needed. It is also possible to combine the advanced teaching concepts home and abroad with the "N+2" assessment.

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