



Exploration on the Reform of the Blended Learning Model for Foundational Job-oriented Courses in NCO Academies under the Background of Internet Plus

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Abstract. In the era of Internet plus, the rapid development of information technology has positioned blended learning as a focal point in current teaching reform. However, the existing learning model for foundational job-oriented courses in NCO academies suffers from issues such as insufficient classroom interaction and inefficient feedback mechanism in formative assessment. Therefore, based on the Rain Classroom platform, this study explores and implements a blended learning model for such courses, covering four key phases: pre-class preparation, in-class teaching, after-class tutoring, and course evaluation. Practice has shown that the blended learning model can effectively stimulate students' enthusiasm for learning, enhance classroom teaching efficiency, and improve overall teaching outcomes.

Keywords: Internet Plus, Teaching Model, Blended Learning, Course Assessment

1 Introduction

With the advent of the Internet Plus era, new vitality has been injected into traditional teaching and learning model. The extensive application of information technology has provided sufficient technical support for online teaching, mobile learning and other approaches, enabling the diversified development of teaching models [1-3]. Among these, the online-offline blended teaching model, which is grounded in internet information platforms and integrates online instruction with face-to-face teaching, has evolved into an innovative instructional model [4]. This new teaching model not only effectively improves the utilization rate of teaching resources, but also provides students with more time for independent learning, which can greatly enhance students' learning initiative and creativity [4-6].

In the context of the rapid upgrading of military equipment, new equipment has put forward higher requirements for the competence and quality of maintenance personnel.

However, the current non-commissioned officer (NCO) vocational education is still dominated by the traditional teaching model, featuring teacher-centered classrooms and insufficient initiative and creativity among students, which severely restricts the training of high-quality NCO talents. Therefore, how to effectively innovate the teaching mode of NCO vocational education, so as to cultivate outstanding NCO talents that can meet the needs of the military's transformation and construction development, has become an urgent problem at present. To solve this problem, reference [7] explores and practices the application of blended teaching mode in English teaching at military academies, and provides valuable theoretical references for the implementation of blended teaching mode in military education. On this basis, this paper conducts exploratory practice on the application of the blended teaching model in foundational job-oriented courses, and provides a theoretical reference for the subsequent teaching reform and talent training of NCO vocational education.

2 Current Situation and Problems in the Teaching of Foundational Job-related Courses

Professional foundational job-related courses are primarily grounded in fundamental theoretical principles, encompassing a wide array of subjects with a significant theoretical focus. The traditional teaching models struggle to stimulate student engagement, leading to unsatisfactory educational outcomes. Based on an analysis of the results of questionnaires conducted among students, the main challenges fall into three categories.

2.1 Teacher-Centered Teaching and Insufficient Classroom Interaction

Traditional teaching models are predominated by instructor lecturing, with all classroom activities dominated by teachers. Effective interaction and communication between instructors and students are seriously inadequate. The questionnaire results show that nearly 70% of students reflected on existing problems including excessive teacher lecturing, boring classroom atmosphere and a lack of interactive activities. This result is mainly attributed to two factors. Firstly, students lack clear learning objectives and low initiative in class participation. They regard the classroom as a teacher-dominated environment and merely position themselves as passive listeners. Secondly, students fail to complete pre-class preview adequately, leading to insufficient mastery of the content and difficulty in following the teaching pace. Coupled with the one-way knowledge delivery from instructors, students' learning enthusiasm is further diminished, resulting in a persistent lack of effective classroom interaction and low student engagement.

2.2 Overwhelming and Difficult Course Content

Foundational job-related courses cover a wide range of content and involve a large number of knowledge points, most of which are highly theoretical. For students with

weak foundational knowledge and inadequate learning ability, the learning difficulty is considerable. The questionnaire results indicate that 10% of students consider the content of Professional foundational job-related courses is very difficult, 43% regard it as relatively difficult, 29% think it is moderate in difficulty, and only 18% believe it is easy. Such a high level of difficulty tends to leave students with a weak sense of achievement, further undermining their learning initiative and enthusiasm, and ultimately resulting in unsatisfactory course teaching outcomes.

2.3 Ineffective Feedback Mechanism for Formative Assessment

In traditional teaching, the formative assessment of courses mainly consists of classroom performance and after-class assignments. Classroom performance is generally evaluated based on students' participation in answering questions and classroom interaction. Restricted by limited class time, this evaluation method can hardly cover every student comprehensively, and teachers' subjective judgments account for a large proportion, resulting in insufficient rationality and fairness of the assessment. After-class assignments are dominated by written work. When there is a large number of students, teachers are overloaded with grading tasks, making it difficult to provide timely feedback on students' assignment completion after submission. Consequently, teachers fail to carry out targeted tutoring and reinforcement in a time, and students are unable to grasp their own learning status promptly.

3 Exploration and Practice of Blended Teaching Model

To address the problems existing in traditional teaching of foundational job-related courses mentioned above, this study carries out exploration and practice on the application of the blended teaching model to such courses in NCO vocational education. Based on the Rain Classroom platform, the research is implemented through four steps: pre-class preparation, in-class teaching, after-class tutoring, and course assessment.

3.1 Pre-class Preparation

Based on analyzing students' learning conditions and the difficulty levels and characteristics of different course contents, learning materials and pre-class tests are released on the Rain Classroom platform. This aims to consolidate students' foundation for in-class learning and enhance the pertinence of teaching activities.

(1) Release Learning Resources. For difficult teaching contents, relevant preview resources such as learning videos, micro-lectures and PPT slides are released in advance on the Rain Classroom, as shown in Figure 1. This measure can effectively supplement students' basic knowledge required and consolidate their knowledge reserve for in-class teaching content. Meanwhile, it can move the learning of some simple knowledge points forward, so that more class time can be devoted to the key and difficult contents, thus improving the efficiency of classroom teaching.

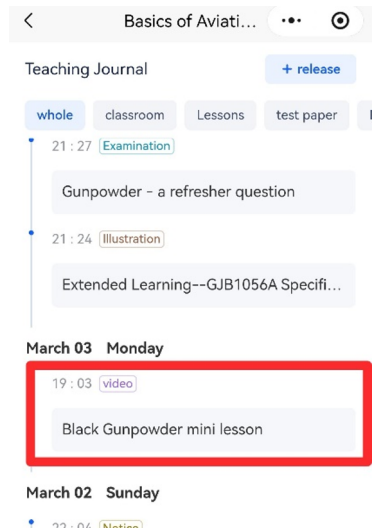


Fig. 1. Release Learning Resources

(2) Assign Preview Tasks. According to the features of teaching contents, various types of preview tasks can be assigned through the Rain Classroom, including traditional content previews and pre-class test questions, as shown in Figure 2. Based on students’ preview of traditional teaching content, teachers can administer pre-class tests to examine students’ preview performance and master their learning foundations. Accordingly, instructors can adjust and optimize classroom instructional design and enhance the appeal of classroom teaching content.

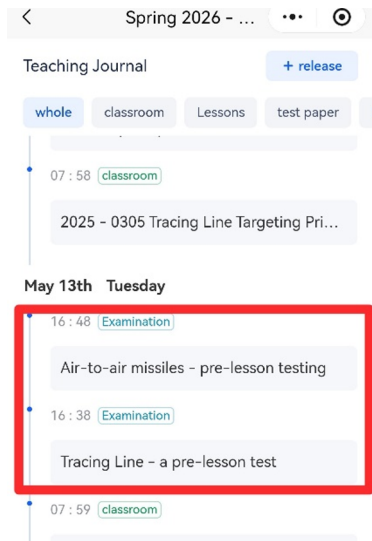


Fig. 2. Assign Preview Tasks

3.2 In-class Teaching

To solve the problems of insufficient teacher-student interaction and low student participation in the traditional teaching model, functions such as in-class quizzes, bullet comments, and submission on the Rain Classroom platform are adopted to increase student participation and stimulate their interest in learning.

(1) In-class Quizzes. According to different teaching contents, in-class Quizzes are set at different stages, as shown in Figure 3. This can check students' mastery of different knowledge in time. Meanwhile, by displaying the answering results to the whole class, students can receive immediate feedback on their individual and class learning, which helps them clearly understand their learning level compared with the class. It also stimulates student's spirit of striving for excellence, enhances their learning enthusiasm and initiative, and effectively solves the problem of insufficient teacher-student interaction in class.

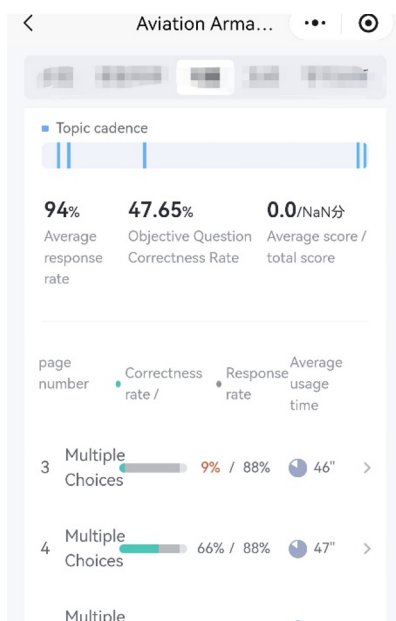


Fig. 3. In-class Quizzes

(2) Bullet Comments. The bullet comment's function is usually used in the thinking session. Through sending bullet comments, students are encouraged to think actively and answer questions, which increase their classroom participation. In addition, based on the keyword analysis of students' bullet comments, teachers' praise and affirmation for students can strengthen students' sense of learning achievement, boost their learning confidence, and further motivate them to participate in class more actively.

(3) Submission. The function is mainly used in classroom discussion, as shown in Figure 4. Students discuss in groups and upload their discussion results through the submission. Teachers randomly select and display the results, which not only cultivates

students' thinking abilities, but also stimulates their learning initiative and improves their classroom participation.

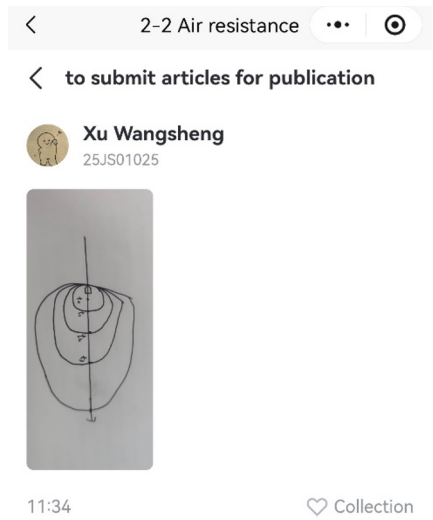


Fig. 4. Display of Classroom Submissions

3.3 After-class Tutoring

With the support of the Rain Classroom platform, on the one hand, learning materials or extended content can be uploaded according to students' in-class learning performance and topics of interest, helping students grasp the knowledge taught in class. On the other hand, in view of the problems reflected in students' after-class assignments, supplementary learning materials can be distributed in time to assist students in identifying and addressing knowledge gaps, as shown in Figure 5.

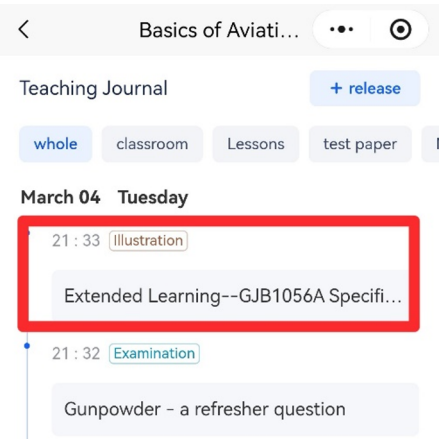


Fig. 5. Upload extended content

3.4 Course Assessment

Based on the Rain Classroom platform, the formative assessment of the course has been optimized from the traditional two-module model consisting of in-class performance and after-class assignments to a three-module system comprising in-class quizzes, after-class assignments and periodic tests. All module are administered through the Rain Classroom platform. Thus, the formative assessment of the course is more scientific and equitable.

(1) In-class Responses. In-class responses mainly consist of two parts. The first part comprises 2 to 3 review questions at the beginning of each class, which are designed to examine students' mastery of previous content and reinforce their understanding of the course material. The second part consists of in-class tests delivered during classroom teaching, mainly used to assess students' comprehension of the content, as shown in Figure 3. After class, all students' in-class responses scores can be directly exported through the platform and incorporated as a component of the formative assessment.

(2) After-class Assignments. After-class assignments are released through the Rain Classroom platform. Objective questions such as multiple-choice, true-false and fill-in-the-blank items are automatically graded by the platform, while subjective questions such as short-answer questions are graded by instructors. Feedback on assignment results can be promptly provided to students through the platform. In addition, instructors can master the accuracy rate of each question via the platform, which facilitate more targeted subsequent tutoring.

(3) Periodic Tests. After the study of several chapters, periodic tests are organized through the Rain Classroom platform, as illustrated in Figure 6. Test development is formulated based on key content, combined with the problems reflected in students' after-class assignments. The tests aim to grasp students' phased learning performance, consolidate strengths and remedy weaknesses regarding the content already learned, and optimize teaching methods.

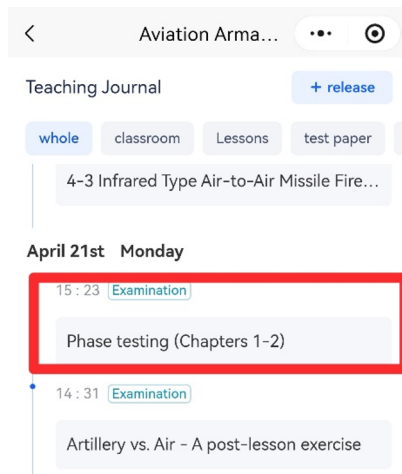


Fig. 6. Assign Periodic Tests

Through exploration in the above aspects, the blended teaching model can be effectively applied to professional courses. This not only remedies the deficiencies of the traditional teaching model and improves the teaching quality and efficiency of foundational job-related courses, but also cultivates students' autonomous learning ability and spirit of teamwork.

4 Teaching Practice Effect and Analysis

4.1 Teaching Mode Practice

To verify the effectiveness of applying the blended teaching model in NCO vocational Education, teaching reform was carried out in the spring and autumn semesters of 2025. One professional foundational course was selected for each of the three distinct training levels (A, B and C). For each training level, one class was taught with the reformed assessment model, while another class was taught with the traditional assessment model as a control group. The classes adopting the reformed assessment model are denoted as A1, B1 and C1 respectively, and the classes with the traditional assessment model are denoted as A2, B2 and C2.

Figure 7 illustrates the distribution of student numbers in different score bands for the classes at the three training levels. It can be observed that the number of students scoring above 90 implementing the reformed assessment model is consistently higher than that adopting the traditional assessment model. Meanwhile, the number of failing students in classes of A1, B1 and C1 is zero, whereas classes of A2, B2 and C2 under the traditional model all record a certain number of failing students. Figure 8 and Figure 9 present the excellent-and-good rate and the average score of each class respectively. The results show that the excellent-and-good rates of A1, B1 and C1 are 12%, 17% and 12%, which are higher than those of A2, B2 and C2 respectively, while their average scores are 5.82, 7.37 and 1.34 higher accordingly.

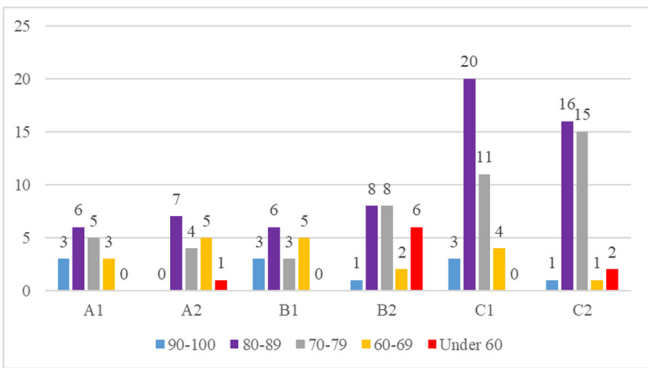


Fig. 7. Distribution of students' number in different score bands for each class



Fig. 8. Excellent-and-good rate of each class

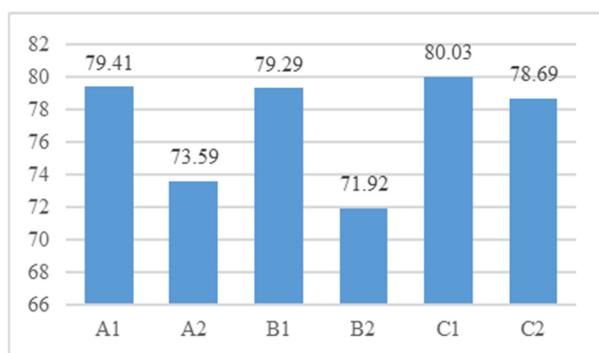


Fig. 9. Average score of each class

4.2 Analysis of Practical Results

It can be seen that the application of the blended teaching model, which deeply integrates traditional teaching with online learning, has effectively improved the teaching effect of professional foundational courses. The specific reasons are analyzed in the following three aspects:

The dominant position of students is highlighted, and the classroom atmosphere is more active.

The blended teaching model emphasizes the central role of students throughout the pre-class, in-class and after-class stages, which effectively boosts their sense of participation. In particular, the introduction of real-time interactive functions of online platforms in class has solved the problem of monotonous interaction in traditional teaching. It added fun and interactivity to classroom teaching, and livened up the classroom atmosphere. Meanwhile, through effective communication and collaboration among students and between teachers and students, classroom teaching is no longer a one-way output by teachers, but become a platform for knowledge sharing.

Personalized teaching is realized and curriculum teaching achieves better results.

The Rain Classroom platform is equipped with data analysis functions. As shown in Figure 10, teachers can promptly grasp students' learning progress on different contents, as well as their performance in homework and periodic tests, which provides data support for the implementation of personalized teaching. Through real-time data analysis, teachers can carry out more precise intensive tutoring on test with high error rates. This effectively improves the efficiency of classroom teaching, enhances the accuracy of after-class tutoring, and ultimately achieves better results in curriculum teaching.

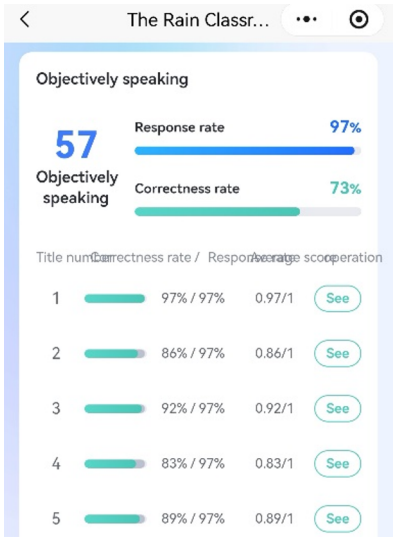


Fig. 10. Data analysis of stage tests

Formative assessment operates effectively, and course evaluation is more comprehensive.

A formative assessment system of in-class quizzes and after-class assignments and periodic tests has been established through the Rain Classroom platform, which effectively solves the problems of traditional assessment models, such as incomplete assessment coverage, low efficiency in homework correction, and inefficient assessment feedback.

On the one hand, all students participate in in-class quizzes, making the assessment scope more comprehensive. Moreover, the statistical analysis of data via the Rain Classroom platform reduces the influence of teachers' subjective factors on students' formative assessment, making it more objective and reasonable. On the other hand, students can know their assessment results immediately and identify their deficiencies after completing after-class assignments and periodic tests, so as to carry out targeted consolidation and review. A complete formative assessment feedback mechanism of content test, result feedback, improvement and optimization has been formed, strengthening the positive promoting effect of curriculum assessment on curriculum teaching.

5 Conclusion

We explored and practiced the blended teaching model in foundational job-related courses for NCO vocational education, and focused on four key links: pre-class preparation, in-class teaching, after-class tutoring and course assessment. It is proved that this model can effectively boost students' classroom enthusiasm and engagement, improve the efficiency of classroom teaching, and realize more objective and comprehensive course assessment. It helps instructors grasp students' real learning status, and enhances the efficiency and accuracy of classroom teaching design as well as after-class tutoring and question-answering. Ultimately, it promotes the continuous improvement of teaching effectiveness in professional foundational courses, and innovatively provides distinctive theoretical support and practical implementation references for the teaching reform of NCO education in military academies, which fills the existing research gap in blended teaching application for vocational education of military non-commissioned officers.

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