

Exploration and Practice of Blended Teaching in Aviation Maintenance Management Course

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Abstract: Taking the unit teaching of "Aviation Maintenance Information Management" as an example, this paper proposes a blended online and offline teaching mode of "PAD+BOPPPS", which effectively solves the problems of strong theoretical content, weak student learning initiative, and difficult application of information theory in teaching. It explores a set of blended online and offline teaching modes suitable for similar colleges and courses.

1. Introduction

The aviation maintenance management course is a core compulsory course for aviation maintenance majors (in all directions). Aviation Maintenance Information Management "is selected from the" Management Work "module of this course, mainly to cultivate students' ability to collect, organize, analyze, and utilize aviation maintenance information required for engaging in aviation maintenance work. In previous teaching practices, it has been found that there are three prominent problems in curriculum teaching: firstly, there are too many knowledge points and a wide range of coverage in the teaching content, which leads to students' fear of difficulties in learning. Secondly, students have weak initiative and enthusiasm in learning, and their participation in classroom teaching activities is low. The third issue is the difficulty in transforming and applying knowledge, slow generation of abilities, and insufficient exercise of higher-order thinking.

In response to the above problems, a hybrid teaching mode of "PAD+BOPPPS" was proposed, which effectively improved the classroom teaching effect and teaching quality by combining the Internet and the information based teaching software platform.

2. Design concept of blended learning with "PAD+BOPPPS"

2.1. Overview of BOPPPS Teaching Mode

BOPPPS is a closed-loop teaching model proposed by the Canadian Teaching Skills Development Workshop, which emphasizes teaching interaction and reflection. It focuses on gradually improving student learning outcomes and divides the classroom teaching process into six interconnected teaching stages with the function of "starting, transferring, and integrating"(as

shown in Figure 1). Its characteristics are student-centered, highlighting teaching interaction and all-round development of students^[1-3]. The BOPPPS teaching model has clear teaching objectives and emphasizes participatory learning for students, but in the face of individual differences among students, it cannot guarantee that every student can actively participate.

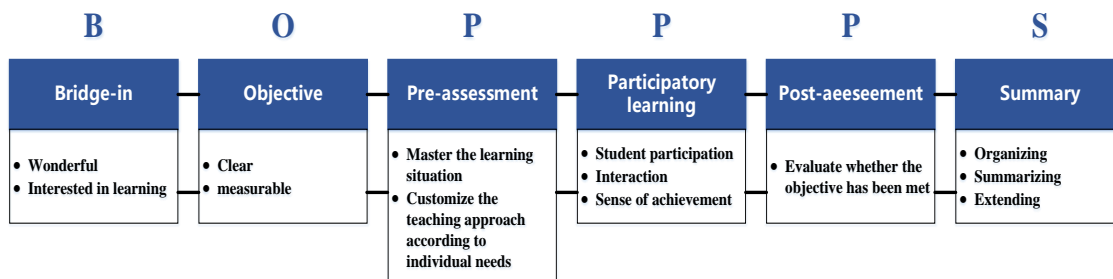


Figure 1: Basic Process of BOPPPS.

2.2. Overview of PAD Teaching Mode

The PAD teaching mode includes three time processes: presentation, Assimilation, and discussion. The classroom time is flexibly divided into two parts, with one part dedicated to teaching content to the teacher and the other part used to organize students to engage in interactive learning through discussion. By separating teaching and discussion, personalized learning opportunities are provided for students, but due to the fact that teachers usually only explain key and difficult points during the teaching stage, they cannot cover the needs of all students^[4].

(1) Presentation

Presentation is the first time process and teaching element in the implementation of PAD. It is to guide students to master the knowledge framework, key and difficult points through the method of "intensive lectures+blank spaces"^[5].

(2)Assimilation

Assimilation is the second time process in the implementation of PAD, which involves internalizing knowledge into personal experience through the combination of learning and thinking, and achieving it through the second teaching process —— " independent learning "^[6].

(3)Discussion

Discussion is the third time process in the implementation of PAD, which involves communication within groups, between groups, and throughout the class to enhance the effectiveness of interactive learning. It mainly corresponds to " peer discussion "in the teaching process and plays an important role in bridging the gap. It directly affects the absorption of lectures, externalization of independent learning, and the effectiveness of teacher-student dialogue, and directly affects the final teaching effect. It has a very important position^[7].

2.3. "PAD+BOPPPS" Teaching Mode

The "PAD+BOPPPS" teaching mode combines the modular BOPPPS teaching mode with the emphasis on the dual role of teaching and learning in the divided classroom^[8]. The PAD teaching strategy is introduced into the "participatory learning" of the BOPPPS mode, which not only meets the common needs of students in teaching, but also provides effective solutions and ways to meet their personalized learning needs. (As shown in Figure 2)

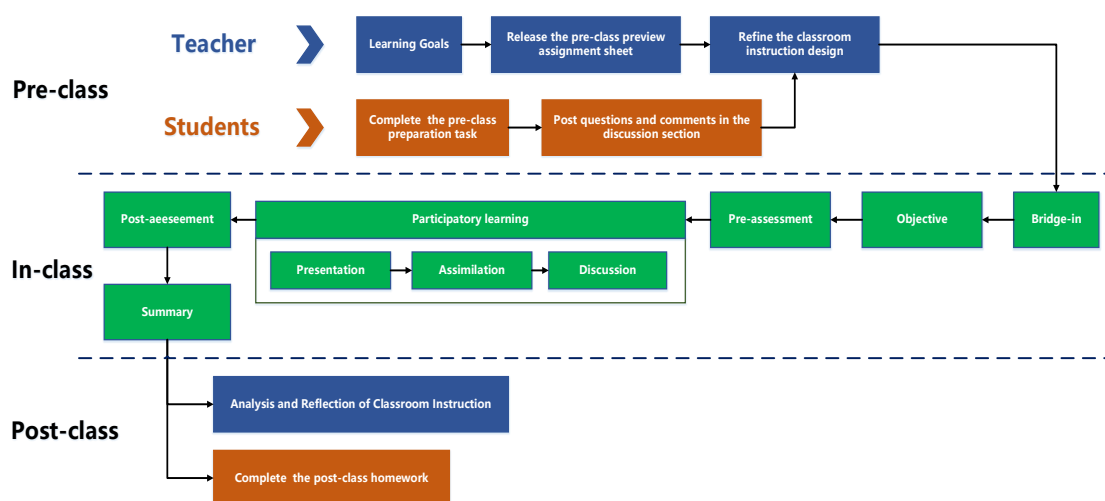


Figure 2: Basic Process of PAD+BOPPPS.

3. Organization and Implementation of Blended Teaching with "PAD + BOPPPS"

3.1. Pre-class

3.1.1. Clear learning objectives

The teaching content of "Aviation Maintenance Information Management" is to correctly use computer information technology and tools to collect, organize, transmit, and use aviation maintenance information in the context of flight maintenance support, and to participate in and complete the process of aviation maintenance information management.

The knowledge objective is to clarify the content and requirements of aviation maintenance information, explain the process of aviation maintenance information management, describe the connotation and role of aviation maintenance information, and use statistical analysis methods for maintenance information; The ability goal is to develop good team communication and collaborative learning habits, to be able to reasonably choose and apply information statistical analysis methods for aviation maintenance information analysis in work, and to guide actual work implementation; The goal of ideological and political education is to make students feel the importance of unity and cooperation, and to strengthen their excellent work style and rigorous scientific spirit in the process.

3.1.2. Conduct a learning situation analysis

Through the study of the previous topics, students have gained an understanding of the knowledge system architecture of aviation maintenance management theory, mastered the relevant basic concepts and theories, familiarized themselves with the main content and organizational implementation procedures of flight maintenance support, aviation maintenance plan management, and aviation maintenance quality management work, as well as the main content, common methods, and implementation steps. During the learning process, they have been exposed to and used a large amount of aviation maintenance information data, laying a good foundation for the study, understanding, and mastery of the knowledge points in this chapter.

3.1.3. Publish a preview task book

In light of students' learning foundation and work requirements, teachers compare them with the

teaching objectives. Then they select appropriate teaching resources and formulate a learning plan accordingly. Through the online information-based teaching platform, this plan is released in the form of a pre-class assignment sheet.

3.1.4. Improve classroom teaching design

Teachers make use of the software of the information-based teaching platform to analyze students' understanding and mastery of various knowledge points regarding this subject. By integrating the feedback from students' pre-class tests and the comments in the discussion area, teachers further identify the key focuses of classroom teaching and carry out targeted teaching design work.

3.2. In-class

Commenting on the completion of students' pre-class preview tasks, we address the difficult and confusing issues that emerged during the preview. Subsequently, we introduce the content of this lecture and organize students to engage in participatory teaching activities in the form of "Padded Class". This approach emphasizes the core learning process of "Presentation - Assimilation - Discussion".

3.2.1. Presentation

For the key and difficult problems that are intensively feedbacked during students' preview before class, we will provide detailed explanations, such as the timing, content, and requirements for filling out aviation maintenance information cards, registration books, and resumes.

3.2.2. Assimilation

In the form of job simulation practice, using a large amount of real data and cases of aviation maintenance information management, students are organized to carry out independent learning and case analysis, actively explore and discover the answers to problems, and experience first-hand the application of learned knowledge in specific work.

3.2.3. Discussion

Through group, inter-group and whole-class discussions and exchanges, students can deeply understand the content and requirements of aviation maintenance information management, master the methods and tools of aviation maintenance information management, help students overcome fear of difficulty to achieve effective learning, complete the internalization of knowledge, and fully exercise their management thinking and scientific logical thinking, forming preliminary aviation maintenance information management capabilities.

3.3. Post-class

Based on the network and information technology teaching software platform, teachers organize students to complete after-class assignments, which further consolidates the effectiveness of classroom teaching. Simultaneously, while uploading new course materials, teachers analyze and reflect on this classroom teaching activity, continuously improving and enhancing the teaching quality.

4. Conclusions

In the specialized teaching of aviation maintenance information management, the blended teaching of "PAD+BOPPPS" effectively eliminates students' fear of difficulties, stimulates learning initiative, improves students' classroom participation, deepens their understanding and mastery of relevant knowledge points, enables students to personally experience the transformation and application of learned theories in aviation maintenance work, fully exercises students' scientific thinking and management literacy, accelerates the generation of aviation maintenance information management ability, improves learning effectiveness, and provides practical reference and inspiration for blended teaching of similar courses.

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