

# Task-Based Hybrid Learning Using Rain Classroom Intelligent Teaching Platform

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## ABSTRACT

As e-learning is becoming increasingly popular in modern teaching with the popularity of the Internet, hybrid teaching is becoming widely used in higher education. This paper introduced the creation of teaching design, teaching materials and teaching organization based on the study and research on hybrid teaching theory. This pilot study aims to analyze the teaching results in the course of the Flight Control System using Rain Classroom intelligent teaching platform. Great efforts on the hybrid teaching design and preparation of teaching materials are done before teaching practice. During the teaching process, participants were assigned course-related tasks and were required teamwork study after class. Progress of the tasks was checked either on-line or off-line. This teaching practice shows a positive effect on the hybrid learning approach. It improves not only the efficiency of class but also the comprehensive ability of international trainees, besides, it builds and deepens good social relations between instructors and trainees. This practice has great significance in the international teaching and training field.

**Keywords:** *Task-Based Teaching; Rain Classroom; Intelligent Teaching Platform; International Student*

*Training*

enhances course satisfaction with deep learning experiences.

## 1. INTRODUCTION

Nowadays, with the quick development of information technology, on-line learning and teaching have become more and more popular. Many practices have shown that great benefit and student satisfaction is achieved when combining e-learning with face-to-face learning, which is called as hybrid learning [1-2]. Hybrid learning comprises the traditional face-to-face engagement with online learning to support and enhance a meaningful interaction between students, teachers and resources [3].

Flight Control System is an important post-course for aviation maintenance engineering foreign military trainees. As concepts and theories of this course are very abstract and complex, the teaching process is pretty short compared with its abundant content, resultingly it's hard to coordinate the difficulty and scope of the course. How to effectively improve the teaching quality and enhance foreign military students' learning experience is a difficult problem to be solved.

This year, task-based hybrid teaching based on Rain Classroom Intelligent platform was adopted in the course as a pilot practice. The class practice shows by sharing teaching and learning resources via network platform, offline learning is extended to on-line learning which breaks through the time and space limitation of traditional face to face only classroom teaching. The hybrid learning stimulates self-directed learning of the trainees and

## 2. BASIC CONCEPT OF TASK-BASED TEACHING BASED ON RAIN CLASSROOM

### 2.1. Introduction to Rain Classroom

Rain Classroom is developed by Tsinghua University and Xuetao X in April 2016. Rain Classroom officially opened to the public freely. It is a hybrid teaching tool that gives a new experience before and after class. Rain Classroom has the following five major functions used in teaching: mobile phone pushing courseware, slide synchronization, exercises answering system, answering barrage and large data analysis. The Rain Classroom is an intelligent platform that connects teachers and students online and offline, so that students are endowed with a new learning experience during the pre-class, in-class and after-class learning. Teachers and students only need to know how to use WeChat and PowerPoint to use this applet. It maximizes the teaching and learning enthusiasm and promotes teaching reform which provides a perfect solution for traditional classroom interaction between teachers and students.

## 2.2. Implementation Procedures of Task-Based Teaching

Task-Based teaching is based on constructivism teaching theory, it transforms the traditional teaching of imparting knowledge into multi-dimensional interactive teaching using the hybrid teaching method. Hybrid-teaching is an important teaching method that combines digital teaching with traditional teaching under the premise of the rapid development of information technology.[3]

Task-Based teaching takes real tasks as the carrier in the form of thesis, topic-selected lecture, project report or troubleshooting, etc. These tasks take students into specific event situations in order to train students to solve the actual problem with his known knowledge. The implementation of Task-Based teaching methods can be divided into assignment of tasks, implementation of tasks, completion of tasks and task feedback, and the completion time can be adjusted flexibly according to the difficulty of tasks. Task has two roles, that is, tasks led by teachers and students learn by tasks. It has changed the traditional teaching mode of "teachers imparting and students listening" and created a new learning mode of "learning and teaching" which involves maximizing teaching and learning enthusiasm and promoting class participation which provides a perfect solution to traditional classroom interaction between teachers and students.

## 2.3. Task-Based Teaching Using Rain Classroom

Rain Classroom teaching platform builds a bridge between teachers and students, teachers can publish MOOC videos, materials and audio tutorials relate to task topics to students' mobile phones in advance, and students can use course resources to teach and test themselves in advance.

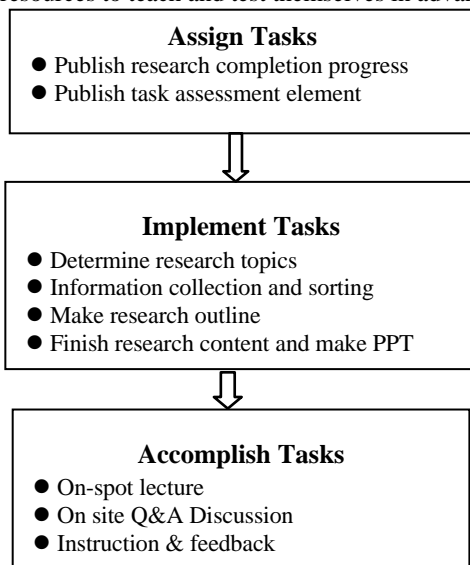


Figure 1. Flow Chart of Implementation Procedure of Task-Based Hybrid Teaching

## 3. TASK-BASED TEACHING DESIGN USING RAIN CLASSROOM

Task-Based teaching combines course content learning and task completion in the teaching process, tasks stimulate self-directed learning and extend the classroom teaching so that the problem-solving skills of trainees are trained.

The WeChat group can release information, organize topics and class discussion whenever necessary so as to provide timely and effective guidance. In the traditional Task-Based teaching implementation of the course content and tasks are done in the classroom teaching time, and sending and sharing of information among the team members and teachers are not timely, effective and interactive enough. The Rain Classroom platform greatly enhances classroom teaching efficiency and pertinence. The implementation process is shown in figure 1.

As students' study in class and research after class are combined and fulfilled through the internet, the classroom is flipped to some extent. Before teaching teachers should carefully design the course which includes selection of tasks, reconstruction of the course content and preparation of the interactive learning.

### 3.1. Reconstruction of Teaching Content and Task Selection

Different from traditional teaching, Students can use online resources to study conceptual and easy content and preview difficult points so that course contents need to be reconstructed and reasonably distributed before, after and in the class. The key and difficult points need to be explained, discussed and analyzed in the classroom. For example, The part of aircraft coordinate system includes the introduction of three-axis coordinate system of air frame, air flow, speed coordinate system, the introduction of aircraft motion parameters and other conceptual knowledge. By using Rain Classroom the courseware and video will be released in advance with self-test exercises. In the classroom teaching, the difficult points like air flow angles and angles of attack and differences of three coordinates will be focused and discussed. As class discussion focused on the difficult points and key points, the class study is more efficient and the goal of deep learning is achieved.

Selection of tasks is very important for properly stimulating the motivation of study. Selection of tasks is based on the following principles: first, topics are closely related to the teaching content to promote deep study; second, task contents are relevant so that at least students in different groups can cooperate and sharing study results; third, task topics are post-orientation so that the self-directed learning has great significance.

### 3.2. Reorganization of Teaching Activity

Task-Based teaching emphasizes student-centered teaching which requires students' self-study, cooperative communication and after class group discussion throughout the whole teaching process. With the help of "Rain Class" and WeChat as a platform for communication between teachers and students, the course resources such as PPT, video and micro-class can be released to students' mobile phone or computers in time, which can integrate the learning process in and out of class, and all the learning behavior data in and out of class can be collected automatically by Rain Classroom platform, it is convenient for teachers to monitor, evaluate and quantify the learning effect of students. This teaching extends the classroom to anywhere and anytime, so that students not only learn about the course content, but also complete course-related tasks to facilitate deep learning. Compared with traditional offline teaching, the role of teachers is more diverse, the role of teachers is expanded from teaching organization to guiding team cooperation and task completion, besides, how to fully stimulate the enthusiasm of students, giving full play to students' initiative is also an important consideration.

## 4. TASK-BASED TEACHING PRACTICE USING RAIN CLASSROOM

The instructor adopted Task-Based teaching mode in two class batches of international students during the teaching of "flight control system" course. When attempting to successfully facilitate the transfer of knowledge, it is essential that teaching be competent, appealing, and recipient oriented [5]. The assigned course-related task promotes the trainees to study after class with teamwork.

### 4.1. Classroom Teaching Practice

In the process of teaching, firstly, the preview and review materials (including the links of related audio and video materials) are released to students' mobile phones before and after class by Rain Class tools so that students can use their free time to learn in Rain Class anytime and anywhere. In the class, the Rain Classroom combines traditional learning activities with mobile terminal learning, especially the functions of random roll call, time-limited questions, sending bullet screens to get the learning situation of students. The teacher adjusts the focuses and progress at any time according to the data received by the Rain Classroom. After class, the intelligent platform can help and guide students and promote the smooth development of teaching tasks through scene design, conversation and cooperation under task-driven teaching mode. Rain Classroom can automatically collect all the learning behavior data in and out of class, which is convenient for teachers to track, monitor, evaluate and quantify the learning effect of students in real-time. The role of teachers

is more diversified. The role of teachers is to organize teaching, guide teaching, guide cooperation and task completion. The organization of Pre-class in class and after class is shown in Table 1.

**Table 1.** Chart of Teaching Organization

Phase	Role of Instructor	Role of Trainee
Pre-class	-Release PPT -Micro lecture...	-On-line preview/test
	-Task assignment	Information collection
In-class	-Key/difficult points analysis -Guiding	-Discussion -Feedback -Involving
	-Offline Guide&check -Progress of task	-Reports -Q&A
After-class	-Guide &check online	-Review -Teamwork

### 4.2. Course Assessment

Curriculum assessment plays an important role in stimulating, monitoring and urging the learning process. The introduction of Rain Classroom intelligent teaching platform in the teaching can realize the monitoring and collection of students' learning situation. Students' pre-class preview can test the learning effect through self-test of exercises. In the class, students test the learning effect according to the courseware pushed by the teacher in real-time, the limited time exercises in the class, and the functions such as answering questions and bullet screens provided by the Rain Classroom at the same time, so as to help teachers get a comprehensive learning situation of students Condition record. In addition, the students are graded according to the proportion in each link of the task completion process to obtain the formative assessment results of the students. In this way, the classroom performance, participation and task completion are combined as formative assessment, accounting for 40%. The final closed book examination accounts for 60% of the total score, and the final total score is weighted. With the combination of process assessment and final assessment, the ascensive, realizing the whole process monitoring of learning.

**Table 2.** Multi-dynamic evaluation method

	Role of Instructor	Role of trainees
Course Assessment	-Release paper test -Online data collection	-Usual performance -Final exam
	-Give feedback -Comments	-Task presentation -Answer Que.

## **5. REFLECTIONS ON TASK-BASED HYBRID TEACHING**

According to the pyramid model put forward by American educator Edgar Dell in 1946, the best way to learn is "imparting", which enables one to have a deeper understanding of knowledge itself by impacting other people's knowledge. So the best way to learn is to teach. Tasked-based teaching using Rain Classroom drives the trainees to teach by giving presentations. It has the following advantages:

### ***5.1. Highlighting the Main Body of Students and Improving Their Self Learning Ability***

To carry out Task-Based-Teaching, the task report presentation focuses on doing researches which relate to the topic, and then "teach" others. Every student is master to complete the task in the whole process of receiving the task, implementing the task and completing the task. Trainees should actively think of ways to solve the task and choose the best solution. Teacher's responsibility is to arrange the task, provide help and give guidance and feedback either online or offline. These tasks are carefully designed and selected, or close to the content and key points of the course, or take the ability training as the core. Teachers should fully consider the actual needs of students. This student-centered teaching method and teacher led mode, combines "teaching and learning" together with proper use of online resources, while "Rain Classroom" intelligent teaching tool combines with WeChat platform to release teaching resources, facilitate real-time interaction between teachers and students, extend the limited classroom teaching to the outside of the classroom, which greatly stimulates students' learning enthusiasm and brings certain "pressure" to students. The "Rain Class" scientifically covers every teaching link from pre-class to after class, which promotes the combination of online learning and traditional entity classroom, and improves the independent learning of international students ability.

### ***5.2. Task-Based Teaching Helping to Improve Students' Comprehensive Quality***

After receiving the task, the students should sort out the processing materials, analyze and summarize the materials, and finally complete the task under the guidance of the teacher. Students' ability of information collection, arrangement and induction has been improved. In the process of completing the task, students need to explore independently, come up with different solutions to solve problems, this cultivate students' ability to analyze and solve problems. Besides, the final step requires students to make PPT and make lectures and answer questions given by teachers and peers, which is conducive to the improvement of students' comprehensive quality.

### ***5.3. Promoting and Deepening Communication, Relationship between Teachers and Trainees***

In this class, most of the international trainees come from Africa and Southeast Asian countries. In the process of completing the task and in the rain class, students can send messages to teachers. Teachers can accurately understand the points that students have not mastered and made clear answers. At the same time, they use words or pictures to communicate with each other to avoid the wrong answers caused by language problems between teachers and trainees, so as to have effective communication with students. In addition, as students are guided individually, the teacher guides and monitor the whole process so as to have a deeper understanding of the equipment of the trainee' country, the way of obtaining information, the students' way of thinking and the degree of mastery of knowledge. With the personalized guidance of teachers, students can quickly learn the ways and methods to complete relevant tasks and avoid taking detours alone. Teachers and trainees often discuss topics and tasks, which promotes communication and cooperation between teachers and trainees. It not only strengthens the academic exchange between teachers and trainees but also deepens the emotional communication between teachers and trainees. It provides a practical model for the realization of the training goal of "cultivating good contacts and cultivating friendly envoys" in our army's foreign training.

## **6. CONCLUSION**

Hybrid learning comprises the traditional face-to-face engagement with online learning to support and enhance a meaningful interaction between students, teachers and resources [6,7]. Task-Based teaching is a kind of hybrid teaching mode that combines online and offline teaching. It is not only a breakthrough in traditional teaching, but also a clear understanding of the practical significance of the combination of online teaching and traditional offline teaching at a deeper level.

The practice of "flight control system" course shows that the hybrid learning might be superior compared to face to face teaching alone, even in the setting of a task-based learning environment where a high level of self-reliant learning has already existed. Further research needs to be done to improve the crucial points in knowledge and competence transfer to support the improvement of teaching in this context. However, more studies are still needed to prove the impact of task-based learning and blended learning on the enhancement of students' knowledge in general.

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