

# Application of the Just-in-Time Teaching (JiTT) Model in Bilingual Courses of Chinese-Foreign Cooperative Education

Na Yao\*, Qingwen Yuan, Ping Yu

Department of Finance & Economics, Shandong University of Science and Technology, Jinan 250031, Shandong Province, China

\*Corresponding author: Na Yao, skd994297@sdust.edu.cn

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**Abstract:** The teaching abilities of bilingual teachers have emerged as one of the major bottlenecks hindering the further development of Chinese-foreign cooperative education projects. Implementing the JiTT (Just-in-Time Teaching) model in bilingual courses of Chinese-foreign cooperative education can effectively integrate information technology with traditional classroom teaching. This integration enhances teaching quality and effectiveness, encourages university instructors to improve their diverse and collective capabilities, promotes digital development, and contributes to the enhancement of students' learning abilities and overall improvement.

**Keywords:** Just-in-Time Teaching model; Information technology; Bilingual

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## 1. Significance of implementing information technology in Chinese-foreign cooperative bilingual courses

With the rapid development of digital information technology, the wave of informatization is sweeping across the globe. In the field of education, the use of information technology has had a profound impact on educational concepts, methods, and models.

The teaching ability of university lecturers is a crucial component of their professional development. Teachers must not only comprehend “what to teach” but also “how to teach.” To deliver effective instruction, lecturers need to possess expertise in their respective fields, including knowledge, skills, and competencies. Educational informatization allows university lecturers to utilize information technology to enhance teaching quality, improve teaching outcomes, encourage self-learning, broaden their professional perspectives, elevate their professional competence, and facilitate peer communication.

As China's opening-up to the world accelerates, the internationalization of higher education in the country has been on the rise. Chinese-foreign cooperative education has become an essential model in China's higher education. However, due to factors such as the relatively short formation period, rapid expansion, and the

absence of comprehensive policy oversight, the quality of Chinese-foreign cooperative education programs in different universities varies. Among these challenges, the teaching capabilities of bilingual instructors have become one of the major bottlenecks hindering the further development of Chinese-foreign cooperative education projects.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) proposes a formula for teaching quality: Teaching Quality = (Students + Course Materials + Environment + Teaching Methods) × Instructors. This formula indicates that the higher the overall quality of instructors, the better the teaching quality. Therefore, for Chinese-foreign cooperative education programs, it is essential for instructors to be proficient in using bilingual instruction and to utilize information technology in the teaching process, achieving the “English + Professional” training model.

## **2. Optimizing the approach to information technology in bilingual courses of Chinese-foreign cooperative education**

In the context of informatization, the talent development in Chinese-foreign cooperative education should embody the concept of information literacy education. It should prioritize information technology development and management, integrate information education content into the curriculum, and reflect the task of nurturing information literacy in professional textbooks, experimental tools, and practical applications.

One approach that can be considered is thematic teaching, breaking the curriculum into several stages, each with its unique characteristics and specific themes. In this way, students can develop their entrepreneurial knowledge in a thematic format. Additionally, the revision and updates of course outlines and training plans should keep pace with the times and reflect the characteristics of informatization.

Various countries have introduced educational technology competency standards for teachers and launched numerous projects to enhance teachers’ ability to apply information technology in their teaching, offering support for the development of educators in an information-based society. Some examples include the Preparing Tomorrow’s Teachers to Use Technology (PT3) program for future teachers in the United States, ICT (information and communication technology) training for teachers in the United Kingdom, Masterplan program in Singapore, and ICT literacy development for teachers in South Korea.

However, informatization not only presents challenges but also provides opportunities for teachers’ personal development. It can enhance teachers’ teaching capabilities for the benefit of students and facilitate the ongoing improvement of teachers’ knowledge and professional competence. This enables teachers to meet the expectations and requirements of an information-based society regarding their roles from the perspectives of teaching activities, students, and professional development. Ultimately, this contributes to the improvement and enhancement of instructors’ diverse abilities, group capabilities, networked development, and the promotion of students’ learning capabilities.

## **3. Application of the JiTT (Just-in-Time Teaching) model in bilingual courses of Chinese-foreign cooperative education**

### **3.1. Introduction to JiTT**

JiTT stands for Just-in-Time Teaching, which is a teaching strategy that emerged in American higher education institutions in the late 20th century. JiTT was defined by Professor G. Novak in his book *Just-in-Time Teaching: Blending Active Learning with Web Technology*. It is a novel teaching and learning strategy built on the interaction between “Web-based Study Assignments” and an “Active Learner Classroom.” The feasibility and

practicality of JiTT are strong, and it was even recognized and supported by the National Science Foundation (NSF) in the United States as an exemplary undergraduate teaching reform project under the “Cycle of Innovation.”

JiTT strategy aims to transform traditional didactic or passive teaching methods by promoting immediate interaction between teachers and students, thereby stimulating students’ proactive learning <sup>[1]</sup>. Its essence lies in the feedback loop created by students’ out-of-class preparation and active participation in the classroom. Students’ level of engagement in the classroom is directly influenced by their preparation outside the class. JiTT effectively combines self-directed learning guided by online resources with in-class teaching, allowing teachers to play an inspiring, guiding, and leading role throughout the teaching process. Even today, JiTT remains an effective method to enhance the effectiveness and capabilities of information technology in education.

### 3.2. Advantages of the JiTT model

The advantages of JiTT are precisely demonstrated through the implementation of this teaching process, which plays a significant role in promoting the current reform of higher education in China. A complete JiTT process consists of two aspects, as shown in **Figure 1**.



**Figure 1.** The complete JiTT process

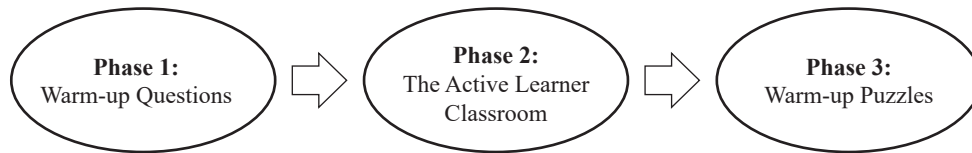
The typical practice involves teachers posting learning tasks on an online platform prior to the class. Teachers provide various digital and online resources, materials, documents, and links related to the content to be covered in the class. Students can use these resources to read, understand, and contemplate the classroom content in advance <sup>[2]</sup>. They pre-summarize answers to questions and submit them electronically. This pre-class preparation by students can be seen as a warm-up before formal classroom instruction. During this process, students gain a thorough understanding of the material beforehand through self-preparation and discussion with each other. If students encounter questions they cannot resolve, they can provide feedback to the teacher through online channels.

Through this feedback, teachers assess students’ self-study levels, adapt their classroom content, revise teaching methods and strategies, and address any issues. In the classroom, teachers select questions from the feedback received from students (usually submitted anonymously) based on the course’s difficulty, common issues, and the students’ existing background knowledge <sup>[3]</sup>. Teachers modify in-class teaching activities as needed to make the most effective use of face-to-face teaching within the classroom.

In the classroom, students primarily learn and reinforce their knowledge through activities such as discussions, debates, experiments, hands-on operations, and other activities organized by teachers. The learning

process mainly unfolds through group discussions, where each learning group can conduct investigations based on specific themes, ultimately producing projects or conclusions. At the end of each session, chapter, or knowledge unit, students can attempt to review and summarize the previously covered content, thus drawing deeper conclusions.

The practical application of the JiTT teaching process can be represented in **Figure 2** below.



**Figure 2.** Practical application of the JiTT teaching process

The core of the JiTT model essentially consists of two main components: one is to provide students with theoretical knowledge from traditional classroom teaching through online sharing, and the other is to establish immediate interaction between teachers and students through the Internet. Online teaching is merely the fundamental environment or platform for this teaching model. JiTT addresses the dullness and monotony of conducting courses exclusively in one environment, which is common in many Chinese universities. It has sparked students' interest, increased communication between teachers and students, and facilitated mutual learning. JiTT is conducive to cultivating students' independent and self-directed learning and teamwork spirit, effectively tapping into the learners' initiative, and promoting creative thinking, thereby achieving better teaching outcomes.

However, JiTT also has its limitations. This teaching model demands teachers to meticulously design questions and tasks for each knowledge point, seek and upload the required teaching resources online, and even create webpages, which can be time-consuming and resource-intensive for instructors. Students are also required to invest more time and effort compared to traditional teaching methods, as pre-class preparation, in-class discussions, and post-class reflection become mandatory assignments<sup>[4]</sup>. Occasionally, technical issues may hinder students from smoothly submitting their assignments through the online platform. The choice of the platform selected in the JiTT teaching process is crucial, as it involves three types of webpages: extension webpages, information webpages, and interactive webpages<sup>[5]</sup>. Building this platform is not a one-time effort, and while the initial investment may be substantial in terms of time and energy, once established as a systematic teaching model, the workload will decrease and the teaching process will become smoother. Combined with students' active participation, the advantages of the JiTT method can be fully realized.

### 3.3. Platform development for the JiTT model

The JiTT model platform can be broadly divided into four modules, as discussed below.

#### 3.3.1. Administrators

As the highest authority of the system, administrators have the ability to log in to the platform and manage teacher and student information. They can perform tasks such as adding accounts, editing personal information, and handling password recovery. Administrators also have the capability to edit and modify forum information and posts, ensuring the smooth operation of the system by removing irrelevant or low-value posts.

#### 3.3.2. Teachers

Teachers begin by registering on the JiTT platform and providing relevant information. Once approved by the

administrator, they receive their teacher account and permissions. Upon logging in, teachers can post pre-class tasks and assign pre-class assignments. They can categorize and upload various learning materials, including audio and video files, reference materials, lecture slides, and more. This arrangement not only aids teachers in organizing resources but also facilitates student access.

Teachers can review assignments submitted by students to gauge their understanding of the materials, identify teaching challenges, and pinpoint recurring issues. They can use this feedback to promptly adjust the pace and focus of classroom instruction for more targeted teaching. Depending on the situation, teachers can also provide suggestions or comments on student assignments, upload reference answers or hints to problems, or organize group discussions. After completing classroom teaching, teachers can upload new discussion topics, moving to the stage of tackling challenging questions (Warm-up Puzzles) to reinforce and deepen students' understanding of the material.

### **3.3.3. Students**

Students must also register on the platform for the first time by providing genuine personal information. After their information is confirmed by the administrator, they receive their personal accounts. Once students enter the JiTT platform by entering their account username and password, they select the subject they wish to study. They can view the assignments and related learning materials provided by the teacher, engage in pre-class preparation, and complete and upload assignments. If they have questions about certain topics or personal insights, they can promptly message the teacher online or participate in forum discussions.

After completing this phase, they move on to the classroom learning stage. After the classroom learning session, students log in to the JiTT platform to view their scores or feedback. They also enter the challenging question research phase of Warm-up Puzzles, participating in group discussions organized by the teacher.

### **3.3.4. Communication forum**

The forum primarily serves as a platform for teachers and students to communicate with each other. In this forum, students can engage in discussions related to the learning tasks set by the teacher. They can post on the forum to share their own learning experiences, ask questions, and seek clarification. Teachers can also use this forum to guide students, promote discussions, and facilitate the tasks of Warm-up Puzzles.

## **4. Conclusion**

In bilingual courses that involve international cooperation in education, the application of the JiTT model can effectively integrate information technology with traditional classroom teaching. This approach encourages students to challenge themselves at a deeper level through independent pre-class preparation and post-class problem exploration. It enables teachers and students to engage in timely communication through the Internet, fostering stronger teacher-student relationships and enhancing student interest in learning. Additionally, it helps create a more engaging learning environment and improves teaching efficiency. However, this teaching model also demands that instructors possess a strong grasp of subject knowledge and high professional competence. Furthermore, it requires teachers to continuously improve themselves and invest more energy and enthusiasm in order to effectively implement the JiTT model.

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## Disclosure statement

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