Design of Seamless Learning and Intelligent Teaching Model for College English Based on the Rain Classroom Platform

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Abstract: This study addresses the field of college English teaching and investigates the seamless learning and intelligent teaching model based on the Rain Classroom platform. By examining the theory of seamless language learning, the importance of breaking the boundaries of learning environments and integrating formal and informal learning is elucidated. The data statistical analysis functions of the Rain Classroom intelligent teaching platform and its auxiliary role in various teaching activities are discussed in detail, and a teaching model based on this platform is developed. This model achieves seamless integration from multiple dimensions, including learning time, space, and content, thereby providing students with a coherent, flexible, and efficient learning experience. It significantly enhances the effectiveness of college English teaching and the achievement of learning objectives, thereby offering new insights and practical references for the reform of college English teaching.

1. Introduction

In the context of the Internet era, computer network technology has become an indispensable tool in foreign language teaching. The Ministry of Education has explicitly stated [1] that educators should fully utilize online teaching platforms to create an autonomous learning path for students that integrates classroom instruction with modern information technology and provides rich autonomous learning resources. College English teaching should actively promote the organic integration of the latest information technology and course instruction, and continue to emphasize the pivotal role of modern educational technology, particularly information technology, in foreign language instruction. With the rapid advancement of mobile wireless interconnectivity technology, designing a college English intelligent classroom teaching model based on the Rain Classroom intelligent teaching platform has presented new opportunities for achieving seamless integration of students' in-class and out-of-class English learning.

2. Seamless Language Learning Theory

George D. Kuh [2] introduced the concept of seamless learning, which integrates formal and informal learning from the perspective of the learning environment. He contended that learning should not be confined to the traditional formal school environment and that learners can engage in learning activities across a broad spectrum of spaces and times beyond the school. The core objective of seamless learning is to transcend the physical boundaries of traditional learning environments and achieve mutual integration and complementarity between formal and informal learning.

In 2016, American educational technology scholar Chan [3] and colleagues further developed the concept of “seamless learning,” focusing on the role of mobile devices. With the ongoing advancements in portable wireless network technology, mobile devices can facilitate the creation of

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a “seamless learning environment,” allowing learners to maintain continuity in their studies across diverse learning contexts. This “seamless learning environment” effectively connects various learning activities both inside and outside the classroom (encompassing formal and informal settings).

Huang Longxiang [4] expanded upon the concept of seamless learning. Drawing on language learning and mobile learning theories, he formulated a seamless language learning (Seamless Language Learning, SLL) framework designed to address the needs of establishing a seamless language learning environment. Huang Longxiang more clearly and explicitly defined the role of mobile devices in seamless learning. He asserted that seamless learning involves the fluid connection and integration of formal (such as school assignments) and informal (such as various spontaneous learning activities outside of school) learning contexts, personal and community learning, and real-world and online experiences. Furthermore, the primary goal of seamless learning is to assist learners in establishing a belief in autonomous learning, cultivating the abilities and habits essential for autonomous learning, and gradually reinforcing students' concepts of self-directed learning. Huang Longxiang’s elaboration on the methods and objectives of seamless language learning aligns closely with the characteristics of foreign language learning and provides a viable framework for the reform of college English instruction based on the Rain Classroom teaching platform.

3. Rain Classroom Intelligent Teaching Platform

“Rain Classroom” is an intelligent teaching tool jointly developed by Tsinghua University and XuetangX. It facilitates close connections between teachers and students through WeChat, a widely used social platform, and integrates information technology, PowerPoint presentations, and WeChat in an innovative manner. This platform adopts a cloud service model to enable comprehensive collection and in-depth analysis of dynamic learning data throughout the teaching process. Rain Classroom transforms the evaluation of classroom teaching from reliance on intuitive judgments based on teachers’ experiences to objective assessments grounded in precise learning data analysis and feedback, thereby providing robust technical support for the construction of smart classrooms.

Rain Classroom leverages advanced big data technology to comprehensively and systematically collect various types of student behavior data throughout the learning process. These data meticulously record students’ learning trajectories, encompassing aspects such as login times, online duration, participation in discussions, and submission and completion of assignments.

When students preview the courseware assigned by teachers before class, the system not only records the total duration of the preview, as well as start and end times, but also accurately tracks the duration and specific progress of each video segment viewed by students. During classroom instruction, the system continuously monitors students’ behaviors in real-time, including check-in status, the number of participation in interactive discussions, and even the specific content of students’ comments. These comprehensive data serve as students’ exclusive learning diaries, meticulously documenting their educational journeys.

The substantial volume of collected data is professionally processed and analyzed by the system, which can transform this information into intuitive and visually accessible reports and charts. These reports not only display an overview of student learning behaviors comprehensively but also illuminate the underlying patterns of these behaviors, providing a strong foundation for teachers to gain an in-depth understanding of students’ learning conditions.

4. Design of Seamless Learning and Intelligent Teaching Model Based on Rain Classroom Platform

4.1 Theoretical Basis

4.1.1 Cyclic Learning Model of College English Based on WeChat

College English instruction follows the “cyclic learning model.” This model posits that the

language teaching process is not comprised of a series of isolated classroom lessons but rather results from the interaction between each classroom learning experience and students' out-of-class autonomous learning, with continuous accumulation of knowledge. The teaching process consists of two instructional flows: the in-class teaching flow and the inter-class teaching flow. Meanwhile, technological means can be employed to closely connect one classroom learning experience with the subsequent one. In this model, pre-class preparation and post-class reflection are situated before and after each classroom learning session, respectively. During the preparation stage, technological tools are used to provide students with resources related to the classroom learning content, primarily to activate students' schemas and prepare them for course learning. During the classroom learning phase, teachers guide students to engage in classroom activities using the target language. In the reflection stage, students review with the guidance of teachers, utilizing resources related to the course content pushed by technological means.

Based upon this model, the author designed the "Cyclic Learning Model of College English Based on WeChat" in an earlier study [5]. However, due to the functional limitations of the WeChat personal public platform (free), the study could only utilize the "subscription," "automatic reply," and menu functions of the WeChat public platform to provide learning content distribution and retrieval services for learners who followed the course public account. Students were able to directly receive teaching content pushed by teachers as well as various information and notifications related to the course by following the university English course public account created by their instructors. Teachers could also establish keyword retrieval systems to facilitate students' self-acquisition of necessary learning content. Nonetheless, the primary functions of the WeChat public platform were not specifically designed for educational purposes; thus, the initial model could only achieve a one-way communication mode mainly reliant on teacher-pushed materials. Additional teacher-student and student-student interactions and feedback still required completion through the class WeChat group.

4.1.2 College English Learning Ecological Environment Model Based on Xuexitong App

The "Xuexitong App" is a mobile learning platform designed for mobile devices such as smartphones and tablets. Through this application, users can not only self-complete functions such as library book borrowing inquiries, searching and downloading electronic resources, and browsing library information but also enable teacher users to create courses and classes via the Xuexitong website or app and conduct analyses of interactive teaching and learning situations. Interactive teaching encompasses various forms, including "announcement notifications," "sign-in," "voting/questionnaires," "homework/quizzes," "class group chats," and "topic discussions." Student users can join a class by entering the "course invitation code" provided by the teacher, view the learning task arrangements through "chapters," and engage in various teaching activities initiated by the instructor.

The implementation of the "Xuexitong App" has facilitated the full integration of technology across all three stages of teaching, no longer limited to the "preparation stage" and the "reflection stage." Moreover, the "Xuexitong App" exhibits enhanced interactivity, which can assist teachers in organizing diverse classroom activities using technology during the instructional process and provides certain data analyses. In comparison to the "Cyclic Learning Model of College English Based on WeChat," the "College English Learning Ecological Environment Model Based on the Xuexitong App" [6] is more conducive to conducting a technology-supported college English teaching model. However, the extent of deep integration of this technological platform with English instruction still requires improvement. It remains challenging to fully reflect the comprehensive language teaching process and the results of formative assessment through this technological platform. Regarding data analysis, the relatively basic percentage presentation method can only provide teachers with a general overview of student responses and does not allow for the identification of specific issues encountered by individual students during the answering process.

4.2 Seamless English Learning Model Based on Technology

From the two models mentioned above, it is evident that technological advancement has created

favorable conditions for the implementation of seamless language learning models. As Huang Longxiang indicated, seamless learning refers to the integration of formal (such as school coursework) and informal (such as various spontaneous learning activities outside of school) learning contexts, individual and community learning, and real-world and online learning. Through technological means, whether within the framework of the "Cyclic Learning Model of College English Based on WeChat" or the "College English Learning Ecological Environment Model based on the Xuexitong App," students' English learning is no longer entirely confined to the classroom. With the integration of these technological tools, students have begun to establish the belief and habits associated with autonomous English learning. Nevertheless, further exploration is necessary to deepen the cultivation of students' autonomous learning abilities and enhance their understanding of autonomous learning concepts.

4.3 Design of Intelligent Teaching Model and Seamless Learning Model Based on Rain Classroom Platform

Unlike traditional language teaching classrooms, intelligent classrooms encompass three primary entities: teachers, students, and the teaching platform. Teachers carefully design learning segments through the teaching platform, while students participate in learning according to the requirements of each segment. The entire learning process is presented in a digital format. Students can ascertain the score of each task by completing the tasks, allowing teachers to gauge students' comprehension of knowledge points based on the overall class response data, thus enabling targeted explanations.

The teaching platform currently employed at our university is "Rain Classroom." The final grade of the course consists of the final exam score (accounting for 50%) and the regular grade (also accounting for 50%). The regular grade encompasses multiple components such as attendance, homework, quizzes, and classroom participation. At the beginning of the semester, teachers establish the composition and weighting of each component of the regular grade through the teaching platform, ensuring that students clearly understand the focus of their efforts. In the ongoing course instruction, teachers assign corresponding tasks in accordance with the composition of the regular grade. After completing each task, students can view their scores in the "Score" column of their personal interface on the Rain Classroom.

The English course based on the Rain Classroom platform includes three segments: pre-class, in-class, and post-class. In the pre-class segment, teachers remind and deliver preview content to students via "Announcements" or "Courseware." Students can obtain corresponding scores upon completing the preview content through the mini-program or web page. Additionally, students can provide "feedback" during the preview process, assisting teachers in targeted content preparation. Simultaneously, teachers can monitor the number of students who have not completed the preview task and remind these students to complete it as soon as possible through the WeChat class group. The score for the preview task will be recorded under the "Homework" category of the regular grade.

At the beginning of classroom instruction, teachers collect students' attendance information by scanning the classroom QR code while simultaneously distributing the pre-class vocabulary dictation "courseware" to assess students' post-class vocabulary review. This combination of attendance tracking and vocabulary dictation not only facilitates a more accurate record of student attendance but also encourages students to enhance their vocabulary retention post-class.

During the classroom instruction process, teachers assess students' understanding of the teaching content by pushing "courseware" answer cards and timely adjusting the difficulty of the instructional content based on the students' response data, achieving targeted instruction. This feedback mechanism based on the platform aids students in maintaining focus on the teaching content throughout the classroom learning experience.

After class, teachers disseminate classroom content reviews and homework reminders through "Announcements" and continue to distribute "courseware" answer cards to collect data on students' homework completion, thus enabling them to identify knowledge points that students may not have firmly grasped and address these in subsequent classes.

This teaching feedback loop based on the platform not only facilitates seamless integration and circulation between classroom instruction and post-class learning but also enables teachers to monitor the entire teaching process more effectively and accurately identify "difficult points" in the instructional process. Students can observe positive reinforcement (an accumulation of scores across each component of the regular grade) upon completing each task throughout the learning process, thereby enhancing their confidence and motivation to excel in English. (See Figure 1)

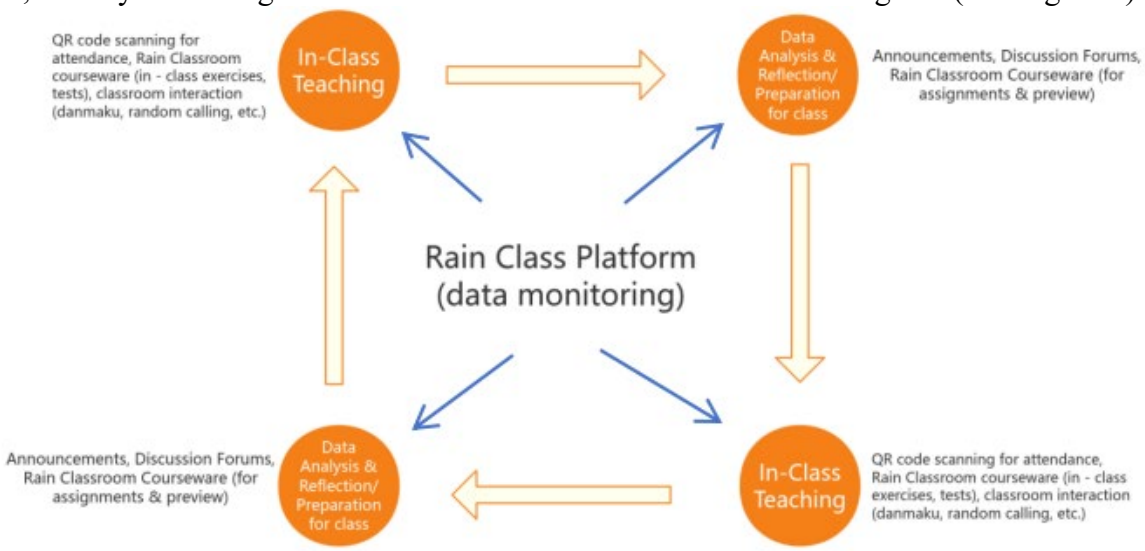

Figure 1 Intelligent Teaching Model Based on Rain Classroom Platform

From the perspective of learning time, Rain Classroom transcends the limitations of traditional classroom schedules and provides continuous support for seamless language learning. During classroom instruction, teachers employ Rain Classroom to push courseware in real-time and initiate interactive quizzes, allowing students to provide immediate feedback regarding their learning status, which constitutes the core period of language learning. Beyond the classroom, the functionalities of Rain Classroom extend to extracurricular time. Teachers can assign homework and distribute review materials via the platform, enabling students to complete and submit assignments at their convenience, thus achieving seamless integration of learning time from classroom to after-class.

In terms of learning space, Rain Classroom breaks through the limitations of physical environments. Traditional language teaching is typically confined to the classroom; however, Rain Classroom supports a blended online and offline teaching model. During class, teachers and students interact face-to-face in the classroom while utilizing the features of Rain Classroom. After class, students can engage in learning through the web or mobile version of Rain Classroom, provided they have network access, whether in a dormitory, library, or outdoors. For instance, in group assignments, members can share materials, discuss problems, and submit assignments through Rain Classroom from diverse locations, thereby overcoming spatial limitations and achieving seamless transitions between learning environments, which aligns with the requirements of seamless language learning models for spatial flexibility.

Furthermore, Rain Classroom also provides substantial support for the construction of seamless language learning models in terms of content connection. Teachers design a comprehensive content system from pre-class preview, through classroom instruction, to after-class review based on the teaching syllabus with the aid of Rain Classroom. The pre-class preview tasks lay the foundation for classroom learning and guide students in their preliminary understanding of key knowledge points. Classroom instruction is informed by preview feedback for in-depth explanations, enhancing students' understanding of the material. After-class homework and review materials help consolidate what has been learned and expand the application of knowledge. For instance, in English instruction, the pre-class preview task may involve distributing English articles to enable students to familiarize themselves with vocabulary and grammar in advance. In class, teachers conduct thorough analyses and explanations of language points from the article. Subsequently, after-class writing assignments require students to utilize the vocabulary and grammatical structures

learned in class for their own creations. The entire process is intricately linked, achieving a seamless transition of language knowledge learning content and enabling students to gradually enhance their language abilities through a coherent learning experience.

The intelligent teaching model of Rain Classroom integrates seamlessly with the seamless language learning model in terms of time, space, and content, providing language learners with a coherent, flexible, and efficient learning experience, thereby effectively promoting improvements in language learning outcomes and the achievement of educational goals.

5. Conclusion

In summary, this study has thoroughly examined the seamless learning and intelligent teaching model of college English based on the Rain Classroom platform. By systematically reviewing the theory of seamless language learning, the significance and goal orientation of transcending the boundaries of learning environments and integrating formal and informal learning have been elucidated. The Rain Classroom intelligent teaching platform, with its robust data statistical and analytical functions, as well as its effective support for all facets of the teaching process, has established a solid foundation for innovative teaching models. The teaching model developed based on the Rain Classroom platform achieves seamless integration in terms of learning time, space, and content, providing novel insights and practical directions for the reform of college English instruction. It is anticipated that this model will assume an increasingly prominent role in future college English teaching and assist students in more effectively achieving their English learning objectives.

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