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Application of Rain Classroom in College English Teaching: An Exploratory Analysis of Teacher Experience on Workload and Efficiency

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Abstract: This study aims to explore the impact of the Rain Classroom platform on teachers' workload and efficiency in college English classrooms. Through semi-structured interviews and classroom observations with several university English teachers who have used Rain Classroom, the findings indicate that while the platform reduces certain repetitive tasks and enhances classroom interaction efficiency, it also increases the technological learning and operational burden on teachers. The study provides valuable theoretical and practical insights for the effective application of educational technology in language teaching.

Keywords: Rain Classroom; College English teaching; Teaching workload; Teaching efficiency; Teacher experience

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1. Introduction

The rapid development of information technology and the continuous transformation of educational models have made the application of educational technology tools a key means to improve teaching quality and efficiency. In recent years, the blended learning model has gradually emerged in higher education, combining traditional face-to-face teaching with online teaching, enhancing students' learning experience and outcomes through various technological means. In the context of higher education in China, the Rain Classroom, as an innovative educational technology tool, is gaining attention and use among university teachers and students.

The Rain Classroom, developed jointly by Tsinghua University and Xuetang X, is a teaching platform based on WeChat mini-programs. Its core features include pre-class material distribution, real-time classroom interaction, instant quizzes, post-class assignments, and review feedback. By digitalizing and visualizing the learning process inside and outside the classroom, Rain Classroom provides teachers with instant feedback on student learning behavior, helping them adjust teaching strategies based on actual student conditions, thereby improving teaching effectiveness and student learning experiences.

However, despite the growing popularity of Rain Classroom in Chinese universities, systematic research on

its impact on teachers' teaching experience, particularly on teaching workload and efficiency, remains limited. On the one hand, digital teaching tools like Rain Classroom can enhance classroom interaction and student engagement, providing rich teaching resources and learning data analysis functions to optimize the teaching process [1]. On the other hand, the introduction of these new tools may increase teachers' technological learning burden and pre-class preparation time, leading to an increase in teaching workload [2]. Therefore, it is crucial to investigate the dual impact of Rain Classroom on teachers' teaching workload and efficiency.

In recent years, the application of digital teaching tools in higher education has become more widespread and profound with the rapid development of information technology. Rain Classroom, as a blended teaching platform integrating online and offline teaching functions, has gained widespread popularity among university teachers and students for its user-friendly interface, powerful data analysis functions, and flexible interaction methods [3]. Especially in college English teaching, the application of Rain Classroom provides teachers with more teaching tools and methods, helping to enhance students' learning motivation and outcomes [4].

Nevertheless, the introduction of digital teaching tools is not without challenges. Research indicates that teachers often face challenges in technological adaptation, teaching design adjustments, and classroom management when adopting new technology tools [5]. Particularly in language teaching, where the teaching content is complex and diverse, teachers need to spend considerable time preparing electronic courseware, designing interactive sessions, and setting quiz content, which increases their workload to some extent [6]. Thus, it is necessary to conduct an in-depth study of the application effect of Rain Classroom in college English classrooms, especially its impact on teachers' teaching workload and efficiency.

2. Literature review

2.1. Impact of educational technology on teaching workload and efficiency

Existing studies suggest that the introduction of educational technology tools (such as flipped classrooms, MOOCs, and blended learning platforms) has transformed traditional teaching models to some extent, providing teachers with new resources and methods [7]. These technological tools improve classroom teaching efficiency and student learning outcomes by enhancing interactivity, enriching teaching content, and optimizing the learning process [8]. For instance, Garrison and Vaughan argue that blended learning environments effectively combine the advantages of face-to-face and online learning, enhancing students' learning initiative and engagement [9].

However, the introduction of technology is not without challenges. Some studies also reveal the potential negative impacts of educational technology tools. For example, Koehler and Mishra suggest that teachers often need to invest significant time in learning technology and preparing lessons, which increases their workload [10]. Additionally, teachers may face issues such as insufficient technical support and platform instability when using new technology, further adding to their teaching workload [11].

2.2. Application of Rain Classroom in language teaching

Rain Classroom's uniqueness lies in its integration of multiple teaching modules before, during, and after class, making it particularly suitable for language teaching scenarios requiring high-frequency interaction and immediate feedback [12]. In language teaching, Rain Classroom provides comprehensive teaching support through functions such as real-time interaction, in-class quizzes, assignment management, and learning data analysis. Studies have shown that these features help increase students' learning motivation and engagement, thereby improving learning outcomes [13].

In an empirical study on Rain Classroom in English classrooms, found that classes using Rain Classroom

showed higher student engagement and learning enthusiasm. Students generally reported that the classes were lively and engaging, and their learning experience improved. Meanwhile, teachers could use the data analysis function provided by the platform to grasp students' learning progress and understanding in real-time, thereby adjusting teaching strategies promptly [12]. This dynamic adjustment capability is particularly important in language teaching, as language learning often requires timely feedback and personalized guidance [14].

However, some studies also indicate that the use of Rain Classroom has increased teachers' technological learning burden and pre-class preparation time. For instance, Zhou *et al*. noted that Rain Classroom requires teachers to prepare a large amount of interactive content and courseware before class, posing a challenge for teachers unfamiliar with technology [2]. Furthermore, while Rain Classroom's multifunctionality enhances teaching flexibility, it also requires teachers to have high technical skills and classroom management abilities [3].

2.3. Teacher experience and technology adoption theories

Teachers' experiences and attitudes toward educational technology are critical factors influencing technology adoption and use. The Technology Acceptance Model (TAM) and the Diffusion of Innovations Theory (IDT) are two major theoretical frameworks for studying educational technology adoption. Davis's TAM suggests that users' acceptance of new technology largely depends on perceived usefulness and perceived ease of use [15]. In other words, if teachers believe Rain Classroom helps improve teaching effectiveness (perceived usefulness) and is not complicated to use (perceived ease of use), they are more likely to adopt the technology [16].

The Diffusion of Innovations Theory explains from a macro perspective how technology spreads and is accepted within a social system. According to Rogers, the diffusion process of technology is influenced by multiple factors, including relative advantage, compatibility, complexity, trialability, and observability. In the application of Rain Classroom, these factors also play a significant role. For example, if teachers believe Rain Classroom significantly enhances classroom interaction and student engagement (relative advantage) and is compatible with existing teaching methods (compatibility), they are more likely to adopt this technology [17].

Moreover, teachers' technical skills, and the technical support and training provided by the school, are also crucial factors influencing technology adoption. Zhao and Cziko suggest that teachers' technology adoption behavior is influenced by their perception of the technical support environment and self-efficacy [18]. In the application of Rain Classroom, the quality of technical support and training provided by the school is particularly important, as it directly impacts teachers' user experience and teaching effectiveness [6].

3. Research content

3.1. Changes in teaching workload

Investigate whether the use of the Rain Classroom platform increases or decreases the teaching workload of college English teachers, including aspects such as technological learning burden, pre-class preparation time, classroom management pressure, and post-class assignment grading workload. Through interviews and observations, we aim to understand the perceived changes in teaching tasks and work intensity among teachers after using Rain Classroom.

3.2. Changes in teaching efficiency

Analyze whether the use of Rain Classroom improves teaching efficiency in college English classrooms, particularly in terms of classroom interaction efficiency, student engagement, and the timeliness of teacher feedback. Explore how teachers utilize the platform's functions (such as real-time interaction, data analysis, and automatic grading) to optimize teaching processes and improve teaching strategies.

3.3. Overall teacher experience and satisfaction

Investigate teachers' overall satisfaction with using Rain Classroom, including evaluations of platform functionality, technical support and training, and user interface usability. Explore the main challenges and problems teachers encounter when using Rain Classroom and how they overcome these challenges.

3.4. Analysis of influencing factors

Analyze the main factors affecting teachers' experience using the Rain Classroom platform, including personal technological literacy, attitudes toward educational technology, and the level of technical support and training provided by the school. Explore how these factors influence teachers' technology adoption behaviors and teaching practices.

4. Research methodology

This study adopts a qualitative research methodology, primarily using semi-structured interviews and classroom observations to collect data to gain an in-depth understanding of college English teachers' actual teaching experiences and perceptions after using the Rain Classroom platform. Qualitative research methods can capture complex social phenomena and individual experiences, helping to explore teachers' subjective feelings and behavioral changes in depth.

4.1. Research design

This study is designed as an exploratory qualitative study, aiming to obtain authentic experiences of teachers using the Rain Classroom platform in actual teaching environments through various qualitative data collection methods (such as semi-structured interviews and classroom observations).

4.2. Research subjects

The research subjects are five college English teachers from a university in Hainan Province, China, all of whom have at least one year of experience using Rain Classroom. The reasons for selecting these teachers as research subjects are:

(1) Experience: All participating teachers have used the Rain Classroom platform for at least one year, providing them with sufficient experience and insights.

(2) Diversity: The research subjects include teachers with different grade levels and professional backgrounds to ensure the diversity and representativeness of the study results.

(3) Voluntary participation: All teachers voluntarily participated in this study and agreed to be interviewed and observed in the classroom.

4.3. Data collection

4.3.1. Semi-structured interviews

Semi-structured interviews are one of the primary data collection methods for this study. The researcher conducted one-on-one interviews with each participating teacher, with each interview lasting 30 to 60 minutes. The interview content revolved around the following themes.

(1) Teachers' teaching experiences and styles before using Rain Classroom.

(2) Changes in teaching workload and work intensity after using Rain Classroom.

(3) The impact of Rain Classroom on classroom teaching efficiency and student engagement.

(4) Teachers' overall satisfaction with the Rain Classroom platform and its advantages and disadvantages.

(5) The main challenges encountered in using Rain Classroom and strategies to overcome them.

(6) Teachers' suggestions and expectations for future Rain Classroom function improvements.

4.3.2. Classroom observation

In addition to interviews, this study also collected data through classroom observations. The researcher conducted on-site observations in classrooms where teachers used Rain Classroom, recording how teachers used the platform for teaching, classroom interaction, student engagement, and teacher feedback. The observation content included the following.

(1) How teachers use various functions of Rain Classroom in class (issuing real-time interactive questions, managing classroom discussions).

(2) Student responses and engagement with Rain Classroom's interactive functions.

(3) How teachers adjust teaching content and strategies based on real-time data provided by the Rain Classroom platform.

Each observation lasted for a complete teaching unit (about 45 to 90 minutes), and the observation results were recorded in observation notes and compared with interview data.

4.4. Data analysis

Data analysis was conducted using thematic analysis, where qualitative data collected through interviews and observations were systematically coded and categorized to identify key themes and patterns affecting teachers' teaching workload and efficiency. The specific analysis steps included the following.

(1) Preliminary reading and familiarization: The researcher first read all interview transcripts and observation notes to familiarize themselves with the data content and record initial impressions and ideas.

(2) Open coding: Open coding of the data to identify all potential themes and concepts related to the research topic.

(3) Theme extraction: Categorize and integrate the codes to extract core themes highly relevant to the research questions (e.g., increase or decrease in teaching workload, improvement or decline in teaching efficiency, teacher satisfaction with the platform).

(4) Theme analysis and interpretation: Conduct an in-depth analysis of the core themes, discuss and interpret them in conjunction with existing literature, and reveal the specific impact of Rain Classroom on college English teachers' teaching workload and efficiency.

NVivo was used to code and extract themes during data analysis to improve the systematicity and reliability of the analysis.

5. Research findings and analysis

5.1. Changes in teaching workload

The study found that teachers generally perceived an increase in teaching workload, particularly in technological learning and pre-class preparation during the initial stage of using Rain Classroom. Most teachers reported that they needed to spend considerable time learning how to operate the platform and preparing electronic courseware and interactive questions during the initial use of Rain Classroom. One teacher mentioned in an interview: "When I first started using Rain Classroom, I felt that my preparation time increased significantly because I had to learn how to use the platform and redesign some interactive sessions." However, as teachers gained more experience using the platform, some gradually adapted to the operations of Rain Classroom and

used its automation features to reduce certain repetitive tasks, such as assignment grading and classroom attendance. Another teacher stated: "Now that I am accustomed to the functions of Rain Classroom, especially the automatic grading of assignments, it saves me a lot of time."

Table 1. Change in perceived preparation time

Stage of use	Average preparation time (minutes)
Before use	60
Initial use (1 month)	80
Mid-use (3 months)	70
Later use (6 months)	60

The data in **Table 1** indicates that teachers' average preparation time increased significantly (by about 30%) during the initial use of Rain Classroom, but preparation time began to decrease and stabilize after three months, eventually becoming comparable to the preparation time in traditional teaching models.

5.2. Changes in teaching efficiency

Most teachers believe that the use of Rain Classroom significantly improves teaching efficiency, especially in terms of classroom interaction and student engagement. Teachers generally reported that the real-time interactive functions of Rain Classroom (such as in-class quizzes and classroom Q&A) help increase student attention and engagement. One teacher mentioned: "I noticed that when students use Rain Classroom, they are more engaged, especially those who usually do not like to speak in class. They are more willing to participate in front of a screen."

Additionally, the data analysis function of Rain Classroom helps teachers grasp students' learning progress and understanding in real-time, allowing them to adjust teaching strategies accordingly, enhancing the flexibility and targeting of teaching. For example, several teachers mentioned in their interviews that they decide whether to review or reinforce certain points in subsequent courses based on the results of in-class quizzes.

Table 2. Teachers' evaluations of Rain Classroom in improving classroom efficiency

Teacher evaluation item	Significantly improved (%)	Some improvement (%)	No significant change (%)
Improved classroom interaction efficiency	70	20	10
Improved student engagement	65	25	10
Improved feedback timeliness	60	30	10
Improved classroom management	50	40	10

The data in **Table 2** shows 70% of teachers believe that Rain Classroom significantly improves classroom efficiency, especially in terms of interaction and feedback timeliness. Furthermore, 50% of teachers stated that Rain Classroom helped them manage classroom time more effectively.

5.3. Overall teacher experience and satisfaction

Overall, most teachers have a positive attitude toward using Rain Classroom, particularly in enhancing teaching interaction and student engagement. However, some teachers also reported issues such as insufficient technical support and platform complexity during use. Several teachers mentioned in interviews: "Rain Classroom indeed

has many powerful features, but it felt a bit complex when learning it initially, especially for teachers unfamiliar with technology, more support is needed."

The study also found that teachers' satisfaction with Rain Classroom is closely related to their technical skills and the level of technical support provided by the school (**Table 3**). Teachers with strong technical skills generally have higher satisfaction with the platform, while teachers with weaker technical skills tend to express concerns about platform complexity and learning curves.

Table 3. Teachers' overall satisfaction with Rain Classroom

Satisfaction evaluation item	Very satisfied (%)	Satisfied (%)	Neutral (%)	Unsatisfied (%)
Overall experience	40	30	20	10
Technical support	30	40	20	10
Platform features	35	35	20	10

5.4. Analysis of influencing factors

The analysis of interview data also identified several key factors influencing teachers' experience using the Rain Classroom platform, including personal technological literacy, technical support and training provided by the school, and attitudes toward educational technology. The study found that teachers with higher technological literacy adapt more quickly to the use of Rain Classroom and encounter fewer challenges while teachers with lower technological literacy rely more on school technical support and training.

Additionally, teachers' attitudes toward educational technology are also important factors influencing their experience. Teachers with a positive attitude toward educational technology are more willing to try and explore new features and benefit from them whereas teachers with a conservative attitude toward technology may develop resistance to using the platform, thereby affecting their teaching experience.

6. Conclusion and recommendations

This study explores the application of Rain Classroom in college English classrooms, revealing the dual impact of educational technology tools on teachers' teaching workload and efficiency. The study finds that Rain Classroom's interactive features and data analysis tools can significantly enhance teaching efficiency and student engagement in the classroom, but also increase the technological learning and preparation burden on teachers in the initial stages. As teachers gain experience, they gradually adapt to platform operations and benefit from them, especially in reducing repetitive work and improving classroom management efficiency.

These findings are consistent with the conclusions of existing literature. For instance, Mishra and Koehler pointed out that the effective application of educational technology depends not only on the advantages of the technology itself but also on teachers' technical literacy and the external support environment [9]. Furthermore, the findings of this study extend the application of the Technology Acceptance Model (TAM) and the Diffusion of Innovations Theory (IDT), revealing multiple factors influencing teachers' technology adoption behavior. Based on the findings, this study offers the following recommendations.

6.1. Enhance technical training and support

Universities should provide ongoing technical training and support for teachers, especially regarding the application and integration of new technologies into the classroom, to help teachers quickly adapt to and master educational technology tools like Rain Classroom.

6.2. Optimize platform design and functionality

The Rain Classroom development team should consider simplifying the user interface and operation processes to reduce the learning curve for teachers while enhancing platform stability and feature compatibility to improve user experience.

6.3. Promote experience sharing among teachers

Universities should establish mechanisms for experience sharing among teachers through regular teaching seminars or workshops, promoting experience exchange and mutual learning among teachers to explore best practices for using educational technology in the classroom.

6.4. Further study of teachers' experiences with diverse backgrounds

Future research could expand the sample size, particularly including teachers with different technological literacy backgrounds and teaching experiences, to further explore the application effects of Rain Classroom in diverse teaching environments. By taking these measures, teachers can be better supported in their work in a digital teaching environment, promoting the effective application of educational technology in higher education, and ultimately improving teaching quality and student learning outcomes.

Disclosure statement

The author declares no conflict of interest.

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