Research on Computer-Aided Assessment of Graduate English Course

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Abstract. The 21st century witnesses a surge of new technologies which have been developing by leaps and bounds and have been applied universally. The development and improvement of computer software and hardware technology is an intrinsic incentive for foreign language teaching reform. The evaluation of graduate English course, in most cases, relies on the teachers, which tends to be lack of efficiency, fairness and objectivity and turns out to be a burden for the teachers. The computer-aided assessment studied in this article mainly covers three types, namely, Rain Classroom, FiF and iWrite, which focus on assessing students' vocabulary mastery, oral practice, and writing skills, respectively. The computer-aided assessment can greatly alleviate the burden of teacher evaluation and most importantly, it has been discovered that these computer-aided evaluations can offer effective formative assessment to enhance the improvement of students' learning and augment the teachers teaching efficiency as well. With the deepening of the reform of the higher education system, the use of computer-aided assessment tools will become an inevitable trend in the information age, and will show unprecedented vitality with its unique advantages.

Keywords: Computer-aided Assessment · Graduate English Course · Formative Assessment

1 Introduction

According to *Outline of the National Medium and Long Term Education Reform and Development Plan* (2010–2020), it clearly articulates that information technology has a revolutionary impact on the development of education [1]. Meanwhile, a prominent issue in current English teaching is that the assessment, conducted mainly by the teachers, focuses on the results meanwhile neglecting the process, which is far from offering timely, effective, and objective feedback to the students. The *Guidelines for College English Teaching* issued by the Ministry of Education pointed out that the evaluation of college English courses should cover all aspects of the curriculum system, and exhorts the teachers to transform from the traditional summative evaluation to formative evaluation [2]. Formative evaluation and summative evaluation originated from American evaluators in 1967. A series of classroom learning and teaching activities that are taken by teachers, students, and their peers to collect, explain, and analyze students learning

evidence are called formative evaluations, with better guidance in teaching and learning [3]. This study aims to explore a novel assessment aided by the computer, which will shift focus to formative evaluation by tracking the process of both teaching and learning. Three computer-aided assessment Apps will be studied—namely, Rain Classroom, FiF and iWrite.

2   Types of Computer-Aided Assessment

2.1   Rain Classroom

Based on WeChat and PPT, Rain Classroom is a smart teaching tool developed by Tsinghua University and Xuetang Online, which can improve the interaction and communication between teachers and students [4]. In the process of the application, Rain Classroom can transcend the three stages of pre-class preparation, in-class teaching, and post-class review, which is demonstrated in Table 1.

This study conducted an experimental study on 66 non-English major graduate students of Shenyang Aerospace University in the autumn semester of 2022. During the 16-week-semester, 16 pre-class and 16 post-class tests were conducted, the results of which are shown in Fig. 1.

The results reveal that the pre-class and post-class test scores of 66 graduate students have steadily and significantly improved. The pre-class test score has increased from 55 points to 73 points, indicating an improvement in the students' preparation; the score of the post-test has increased from 63 to 95, showing that students have made significant progress in mastering what they have learned (Fig. 2).

Table 1.   Utilization of Rain Classroom for graduate English course

| Pre-class	Teacher	The teacher releases quizzes in the rain class, and the statistics of the quizzes will help the teacher clarify the students' problems during the preview process and then adjust the teaching strategies accordingly.
	Students	The students complete the preview tasks and quizzes, and provide feedback to the teacher.
In-class	Teacher	The teacher can arouse the interest of the students by inviting them to share their opinions and answers in the Rain Classroom, which will provide instant and detailed statistical analysis and liven up the classroom atmosphere as well.
	Students	The students can submit their opinions on the bullet screen or vote for best answer to be better involved in the class activities.
Post-class	Teacher	By releasing homework and quizzes in Rain Classroom, the teacher will collect data and reflect upon the teaching process for future refinement.
	Students	The students will reinforce and consolidate what they have learned by completing the homework and quizzes in Rain Classroom.
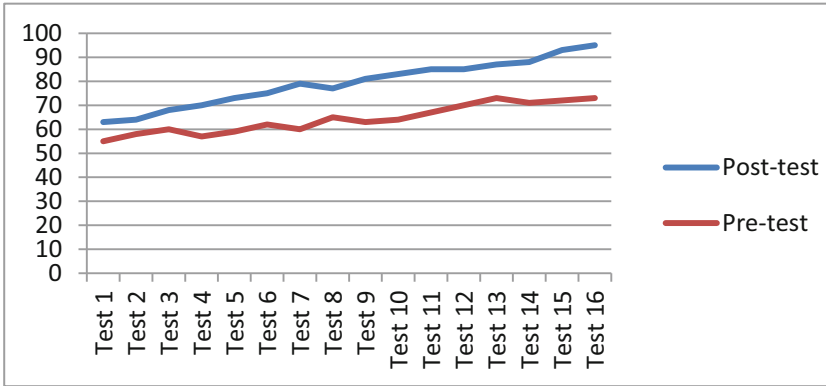
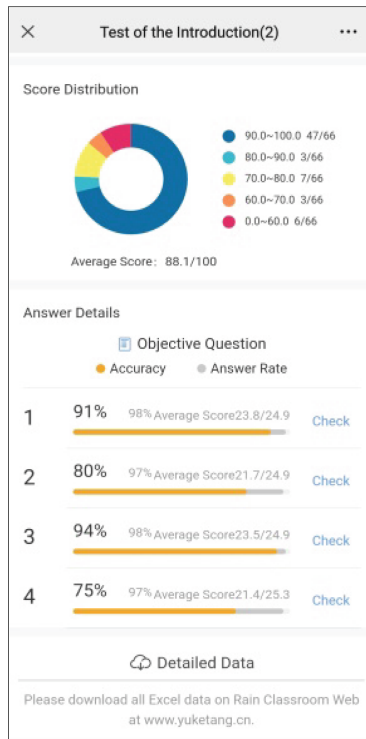**Fig. 1.** Scores of Pre-tests and post-tests in Rain Classroom

Fig. 2. Score distribution and score rate on Rain Classroom

As is shown above, the Rain Classroom can provide timely, clear, and effective feedback, according to which the teacher can adjust teaching priorities based on these feedbacks, focusing on students' weak points.

Table 2. Analysis of students' performance before and after practice on FiF

Oral Performance					
		Score	**Performance**	**Fluency**	**Completeness**
Before Practice	*M*	83.15	80.15	81.73	87.63
	SD	6.78	9.44	8.32	11.52
After Practice	*M*	90.22	88.46	89.39	92.81
	SD	5.03	7.22	6.77	7.33
MD		-7.07	-8.31	-7.66	-5.18

2.2 Oral Training App—FiF

The FiF oral training system is a multi-terminal oral teaching and management system, developed by iFlytek. FiF can offer effective and efficient performance evaluation, which refers to the students' ability to apply previous knowledge and skills to solve problems or complete tasks [5]. Adopting the intelligent speech technology and multi-level oral intelligence evaluation, FiF provides the students with rich practice materials and creates a simulated English environment (Table 2).

The results show that the 66 graduates (non-English majors) at Shenyang Aerospace University make a prominent progress in terms of pronunciation, fluency, and completeness after they practice reading on the FIF oral training app. The results are consistent with other research on the effect and facilitation of the FiF on students' oral English [6].

2.3 Writing Practice App—iWrite

The Automated Essay Scoring (AES) system is defined as the *computer technology for evaluating and grading essays*, which has gone through three stages—project essay grade, intelligent essay assessor, and writing roadmap [7]. The similarity of the automatic scoring systems abroad is that they all require training on automatic scoring systems using essay training sets [8]. Inspired by the automatic scoring technology, in 2015, Beijing Foreign Studies University and Foreign Language Teaching and Research Press jointly designed and developed the iWrite English Writing Teaching and Evaluation System 2.0, on the basis of language testing and second language writing theory. The iWrite can score compositions, and render constructive suggestions for revision from the aspects of vocabulary, grammar, sentence pattern and structure. This study collects 66 valid essay samples and analyzes the collected data. The comparison of iWrite assessment and manual assessment is shown in Table 3.

It shows that iWrite has a higher average score with a smaller score gap and a more concentrated composition score. While manual scoring has a larger score gap, and can better reflect the variety and difference of students' compositions. Overall, iWrite has a high reliability in automatic scoring and can almost parallel manual assessment, which concurs with the results of other similar studies in China [9].

Table 3. Comparison of iWrite assessment and manual assessment

	iWrite Assessment	Manual Assessment
Samples	66	66
Average score	8.023	6.846
Standard deviation	0.951	1.625
Median	8.0	7.5
Minimum	6.0	2.0
Maximum	9.5	9.5
Skewness	-0.471	-1.113
Kurtosis	-0.461	1.665

3 Functions of Computer-Aided Assessment

Assessment plays a vital role in both teaching and learning process, which facilitates the students to identify their weaknesses, consolidates what they have learned, and contributes to the improvement accordingly [10]. Thus, teachers are supposed to polish their ability to bolster the effectiveness and efficiency of formative evaluation, which will offer guidance to teaching [11]. The formative evaluation provided by the computer-aided assessment—Rain Classroom, FiF and iWrite—focuses more on the evaluation of the process of teaching and learning, rather than on the results exclusively, which will beget more conductive adjustment of the teaching arrangement and manifest a clearer record of students' learning process. The computer-aided assessment is more than a way of assessing, and it can incorporate personalized learning and provide a powerful scientific and technological platform for college English reform in the digital era.

4 Conclusion

Based on the computer-aided assessment—Rain Classroom, FiF and iWrite, the graduate English courses integrates the computer technology with English education, which offers comprehensive and objective assessment of both the teaching process and the learning process. The novel computer-aided assessment can break the confinement of traditional classrooms, contributing to more efficient interaction and the enhancement of both teaching and learning. The teachers are supposed to play a leading role to guide the students to better exploit the computer-aided assessment.

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