

A Case Study of Paperless Testing of College English Based on the iTest Intelligent Testing Cloud System

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Abstract: In the context of the high-speed development of AI-driven intelligence in the sphere of education, the college English testing mechanism is turning into a smart paperless testing system which will replace the paper-based testing. Using the iTest Smart Testing Cloud System as the study subject, this paper explores extensively its applicability and implementation approaches, impacts of implementation, as well as optimization strategies in paperless testing of college English via research methodologies such as case study methodology and questionnaire survey methodology. According to the findings of the research, the iTest System can be highly effective as it uses the main advantages of the system, namely adaptive testing, intelligent marking and big data analysis, thereby eliminating the drawbacks of traditional testing, such as inefficiency, imbalance in assessment, and waste of resources and demonstrating significant superiority in terms of better educated instruction creation and support of individualization in education. However, the system has not been completely free of problems related to its application, including the technological uniformity and the online literacy of teachers and students. In this paper, the author offers certain counter-measures to such a problem providing some theoretical foundations and practical experience to university authorities to create intelligent college English tests.

Keywords: iTest System; College English; paperless Testing

1. Introduction

1.1 Research Background

With the deep integration of AI technology into education and teaching, smart education has become a core direction for the reform and

development of higher education. As a compulsory basic course in higher education, college English relies on a scientific and effective testing and evaluation system, which directly influences teaching quality and talent cultivation outcomes. *College English Teaching Guide (2020 Edition)* explicitly advocates “actively applying modern information technology to build a smart teaching environment and innovate teaching models and evaluation methods” [1].

Traditional paper-based college English tests suffer from numerous drawbacks. For example, printing, distribution, and marking of test papers are time-consuming and labor-intensive with low efficiency; in formative assessment, insufficient content and frequency of evaluation make it difficult to comprehensively reflect students’ learning processes and comprehensive abilities; and extensive use of paper test papers causes resource waste and environmental pressure [2].

As a leading educational testing platform in China, the iTest Smart Testing Cloud System (hereinafter referred to as the iTest System) integrates item bank management, intelligent test paper generation, adaptive testing, automatic scoring, big data analysis and other functions, providing all-round technical support for paperless college English testing [3]. Therefore, exploring the application model and practical effects of paperless college English testing based on iTest System is of great practical significance for promoting the development of college English testing and improving the teaching measurement and evaluation system.

1.2 Research Significance

With the backdrop of AI-driven intelligent education, this research presents an outline of theory that could be used in developing paperless college English tests on the basis of the iTest System, which can provide theoretical backing to the development of language tests as a fully informationized and intelligent system.

This research has practical implications as it gives an example of implementable and scalable solutions to make paperless college English exams feasible in higher education institutions through its analysis of the application of iTest System and its outcomes. This study enables teachers to adopt the use of the intelligent tests, refine their process of evaluation of the teaching, increase students capacity to self-study and ultimately facilitate better overall improvement of teaching in colleges.

2. Research Theories and Methods

2.1 Definition of Core Concepts

2.1.1 Smart Paperless College English Testing

The smart paperless college English testing is a testing scheme based on modern information technology, with computer and network as carriers and the integration of intelligent functions like smart test paper generation, personalized testing, automated grading, and big data analysis to carry out all-encompassing, dynamic, and personalized assessment of students' English proficiency. The main characteristics include intelligence, efficiency, and personalization.

2.1.2 iTest Smart Testing Cloud System

The iTest Smart Testing Cloud System provides a complete set of language tests comprising of the entire item bank management, intelligent test paper generation, online examination, automatic marking and score reporting, score analysis, and teaching feedback processes. There is also support for multiple terminals and it can accommodate various testing requirements such as quizzes in the classroom of university-level English courses, post-class exercises, periodical tests, end-of-year examinations and proficiency tests.

2.2 Theoretical Foundations

2.2.1 Constructivist Learning Theory

The constructivist learning model states that learning is an active construction of the meaning of knowledge by learners with emphasis on situatedness, interactivity and individualization [4]. The iTest System supports the fundamental demands of constructivist learning theory by offering genuine language testing situations, customized test materials and feedback, and facilitating adjustments in student learning methods independently.

2.2.2 Formative Assessment Theory

The theory of formative assessment advocates identifying and diagnosing students' learning problems throughout the learning process [5]. The iTest system can accommodate different formative assessments like periodic tests and classroom quizzes that could facilitate real-time gathering of students learning data and prompt feedback to teachers and students hence technical support in implementing formative assessments.

2.2.3 Educational Big Data Theory

The concept of educational big data theory focuses on gathering and processing large amounts of information produced in teaching and learning to reveal underlying trends and value, which can be used as scientific foundation of educational decision-making. Its core lies in processing massive volumes of data and extracting valuable information from such data to support more accurate decision-making, forecasting and insights [6]. The iTest System is a system that records data in multiple dimensions such as the behavior of students in answering questions, scores of tests and learning trajectories. It provides individualized learning reports and teaching recommendations by conducting big data analysis to promote precision teaching.

2.3 Research Methods

2.3.1 Case Study Method

The Yancheng Teachers College is chosen to be used as a research case since it will allow conducting a detailed study of the iTest System use in college English testing in colleges and universities and conclude on the standard models of its application.

2.3.2 Questionnaire Survey Method

The questionnaires are handed over to 30 college English teachers and 500 students of the case college. Once the valid questionnaires have been collected, data processing is done to assess teachers and students satisfaction on the application effects of the iTest System, the current problems and recommendations towards improvement.

3. Analysis of the Features and Application Cases of the iTest System

3.1 Core Modules and Features of the iTest System

The core functional modules of the iTest System include user management, item bank

management, intelligent test paper generation, examination management, automatic marking and score analysis [7]. It also supports data security and backup. The three key modules have their respective characteristics.

Initially, the intelligent item bank management module. The largest item bank has all kinds of questions related to college English, including listening, reading, writing, and translating questions, which number more than 100,000 in total, and cover various levels of difficulty and areas of knowledge. It also assists teachers in creating personalized item banks, adding questions, and changing question properties. The system allows smart categorization and retrieval according to multi-dimensional factors like question hardness, item bank tags, and question type. Also, the item bank can be updated dynamically so that the test content remains timely and relevant.

The second is the intelligent test paper generator and examination management module. Intelligent test paper generation feature enables teachers to set parameters like knowledge point coverage, difficulty distribution, and question type proportions and the system is capable of creating several sets of parallel test papers that will efficiently reduce the risk of question leakage. Examination management module has multiple modes available such as online exam booking, scheduled examinations, and restarting after interruptions. It helps in real time tracking of the examination process, automated identification of cheating activities like screen change and a hybrid invigilation model with remote background monitoring and on site invigilation to ensure equity and impartiality.

The third is the automatic scoring and score analysis module. On objective questions, the system will score and generate grades automatically at 100%. On subjective questions like writing and translation, the system uses Natural Language Processing (NLP) technology to perform intelligent scoring on various dimensions including language expression, content integrity, logical coherence and so forth [8]. Its consistency is more than 85 percent relative to manual scoring. Multi-dimensional score reports that include the distribution of the overall class scores, knowledge point mastery and individual student errors are produced by the score analysis module which allows data exporting and visualization to assist teachers in identifying their teaching priorities and

challenges immediately.

3.2 Analysis of Application Cases

Case 1: Application in the Final College English Examination at Yancheng Teachers University

In total, 140 classes including over 5,000 new students of 2025 (Yancheng Teachers University) participated in the final examination of the autumn semester. The iTest System was used to deliver the final exam of college English in various sessions within the computer lab of the university.

The examination took 90 minutes and comprised of four parts which are listening, reading, writing and translation. Listening and reading were objective questions whereas writing and translation were subjective questions. The test papers were developed using horizontal intelligent grouping of several sets that covered the whole range of knowledge points of all the taught units. In the case of invigilation, the university utilized an integrated approach of online background monitoring and on-site invigilation, where the system could detect switching between screens and 2-3 invigilators present in each examination room.

The system created test papers using a customized final exam item bank within just 30 minutes, which is very efficient and convenient compared to the conventional paper-based test preparation and printing. The process only took 23 invigilators and 7 computer labs as opposed to 100 invigilators and over 50 large classrooms used when carrying out traditional university-wide exams, hence saving significant human and material resources.

The objective questions had a 100 percent correct automated scoring, whereas the subjective questions had a rate of 88 percent between intelligent scoring and manual scoring, which decreased the amount of paper-marking that teachers do by 70 percent. Statistics on scores and analysis reports of all classes were created within two hours with no additional work needed by the course instructors.

According to the questionnaire survey, 90 percent of teachers stated that the iTest System increased the efficiency of testing and 82 % of students were pleased with the paperless testing experience.

Case 2: Application in Formative College English Assessment at Yancheng Teachers University

The Yancheng Teachers University focuses on

formative assessment of college English and incorporates the iTest System into daily teaching assessment. Unit tests (one per unit) and periodic tests (three times per semester) are included in the test design that covers the 30 percent of the total course score.

At the same time, the iTest System will automatically create individualized learning reports using the information about the test results of the students and determine the areas where they are weak in their English language skills and make learning recommendations. The teachers may also change the pace of teaching and focus depending on the class-level mastery of knowledge points reports that are produced by the system to give specific instructions regarding general issues.

The iTest System has been in use in the university in various years with more than 10,000 students being served yearly. The ability to learn independently among the students has increased considerably, and they are capable of identifying the gaps in their learning using system feedback. The focus of the teacher in teaching has been improved with 75 percent of the teachers confirming that formative assessment can be used to enhance teaching approaches.

3.3 Investigation and Analysis of Teaching Washback Effects

The questionnaire survey in relation to teachers instruction indicated that 80 percent of teachers thought that the score analysis reports of the iTest System were useful in helping them to identify the weaknesses in the learning of the students and change their teaching approaches accordingly; 85 percent of teachers reported that the automatic generation of intelligent test papers by the system saved much time in the creation of tests as it enabled the teachers to spend more time on teaching reform.

Personalized feedback of the iTest System was said to have helped 78% of the students in understanding their learning status as well as having a specific study plan; 79 percent of students stated that they enjoyed and were motivated by the experience of paperless testing; 68 percent of students thought that the error analysis feature of the system contributed to the consolidation of the knowledge they had learned.

4. Challenges in the Application of the iTest System and Countermeasures

4.1 Major Challenges

4.1.1 Technical Challenges

The issue of network and equipment stability is still present. The lack of enough bandwidth on the campus network can result in congestion and lag during massive examinations, which may affect the testing experience of the students. Old or poorly performing computers and network hardware are likely to crash and freeze when responding.

The threat of data security requires careful consideration. Even though the iTest System has some data security features, there are still risks within a complex network environment including data leakage, hacker attacks, and incomplete examination data, which can lead to test question breaches, theft of students personal information, and loss of examination data.

4.1.2 Challenges for Teachers and Students

There is a need to improve the technical competence of teachers. A few older teachers are not very receptive to information technology and cannot operate it in more complex tasks like intelligent test paper generation and score analysis, which restricts the usefulness of the system.

Disparities exist among students in the field of digital literacy. There are some students who have been used to the conventional paper-based tests and do not value paperless testing enough [9]. Only a few of students with poor digital literacy do not know the way of operation and mistakes in operations are common. The rest do not have the ability to learn independently and are unable to make effective use of the personalized feedback and learning materials to study on their own.

4.1.3 Teaching Challenges

There should be a better connection between assessment material and instruction. A few instructors are unable to perform an analysis of teaching content in detail when making use of the iTest System to create test papers, which causes mismatching between test questions and the teaching priorities and weakening of teaching washback.

The application of formative assessment has not been done in sufficient depth. There are some teachers who do not have enough knowledge about formative assessment and view the iTest System as a simple online answering mechanism without realizing that it can be used in formative assessment to conduct process-based evaluation

and create a loop of teaching-testing-feedback-improvement.

4.2 Countermeasures

4.2.1 Technical Support Strategies

It is important that universities reinforce their network and infrastructure development through higher investment in campus networks to improve the bandwidth capacity and stability of the networks to facilitate easy mass examination processes. A support mechanism regarding equipment ought to be created in order to ensure that testing devices are updated, inspected and maintained so as not to disrupt the process. During the examination, each examination room will be staffed with a laboratory technician to resolve equipment or network problems encountered by students during the test [10].

The stakeholders must cooperate to boost the level of data security. The developer of the iTest System ought to also increase the level of data encryption and security protection by testing vulnerabilities regularly and addressing them. The universities need to develop rigorous data security control regulations that would allow uniform collection, storage and use of test data and ensure its non-leakage.

4.2.2 Training Strategies for Teachers and Students

Teachers should be trained specially. Targeted training of the iTest System should be organized by universities to invite technicians and teachers with outstanding performance to conduct the courses that cover the functioning of the system, creating smart test papers, analyzing scores and integrating teaching into it. There must be a teacher exchange program that will enhance experience sharing and overall enhancement of technical application.

The digital literacy of students must be enhanced. The teaching of digital literacy needs to be incorporated in college English classes to assist the students in acquiring paperless testing techniques and answer-related skills. Preparatory tests ought to be carried out prior to formal tests to acquaint students on how the system works and minimize mistakes. Students with low digital literacy should be given extra help and support.

4.2.3 Teaching Optimization Strategies

Teacher must improve the connection between the test material and education. Teacher must analyze the teaching goals and content thoroughly and plan the generation of test papers

depending on the level of learning and mastery of the student to make sure that the test questions are in line with the priorities of the teacher in terms of teaching. Textbook-based and hierarchical custom item banks should be organized into teaching teams. The evaluation of test outcomes must be done on a regular basis to change the teaching methods as quickly as possible.

It is necessary to deepen the introduction of formative assessment. Higher education institutions must develop specific guidelines on how to implement formative assessment and the criteria of using the iTest System. The combination of unit tests and periodic tests are the methods that teachers should use in order to gather comprehensive data on learning. There should be a personalized feedback system in which teachers offer specific teaching advice and instructional support depending on the results of student tests.

5. Conclusions and Prospects

5.1 Research Conclusions

By closely examining how the iTest System is applied to paperless college English testing, this paper has come to the following conclusions:

To begin with, the iTest System has core features that include intelligent management of item banks, adaptive testing, intelligent test paper generation, automatic scoring and big data analysis. It has a high level of technical stability, reliable data security, and good usability and serves as a complete technical solution to paperless testing in college English.

In the second place, in comparison with conventional paper-based testing (paperless testing) is much more efficient in testing college English, less costly, provides timely and accurate feedback on the teaching process, helps optimize the decisions made by teachers, and facilitate student learning individualized, which has clear application benefits.

Finally implementation of paperless college English testing has issues of technical stability, data security, teacher and student flexibility, and teaching integration. Such issues can be efficiently eliminated by universities by improving the construction of networks and devices, enhancing the system of data security, offering special training to teachers and students and increasing the level of teaching integration.

5.2 Research Prospects

As a result of the constant advancement in information technology with the introduction of artificial intelligence, big data, and cloud computing, the use of paperless college English testing is likely to shift towards greater intelligence.

The development of language testing theory is also accompanied by the emergence of multimodal testing (e.g., oral tests, video-based writing tests), which would play a significant role in the evaluation of college English. The cross platform integration will go even deeper; the iTest system will increase connections with college English teaching systems, learning management systems and smart campus systems, allowing exchanging and merging of learning, testing and teaching information to create a smart education ecosystem by combining the elements of testing-teaching-management.

The present work offers theoretical information and practical experience on how to use the iTest System within the context of paperless college English testing; however, it also has its shortcomings, including a low degree of representativeness of the research samples and a very brief duration of the study. The subsequent studies can increase the number of samples, prolong the research time, and even conduct additional research into the impact of the system on various kinds of universities and the impact on students with different levels of English proficiency to bring out more elaborate and detailed results of the advancement of the paperless college English testing.

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