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An Empirical Study of Intelligent Assessment and Feedback Systems in English Digital Education

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ABSTRACT
Against the backdrop of digital education, this paper proposes introducing an intelligent evaluation feedback system into college English digital course construction, building relevant systems and conducting simulation training. Test results show that 5 consecutive conversations contain 102-158 words and 15-20 sentences; the word recognition accuracy reaches up to 98% (for 50 words), 99% (for 100 words), and 98% (for 150 words); and the learning improvement index increases by approximately 0.3 after use. It helps understand students' learning outcomes and provides teachers with information support.

KEYWORDS
Intelligent assessment; Feedback system; English education; Digital education

1 Introduction

With the rapid advancement of information technology, intelligent evaluation and feedback systems have emerged, integrating computer technology, automatic control theory and artificial intelligence to address educational issues. Traditional teaching evaluation relies on teachers' subjective judgments. This paper designs a digital English course system based on intelligent assessment, with reference to existing mature solutions. The practical application of such intelligent assessment and feedback systems in education has achieved positive results. The contributions are: building a complete evaluation and feedback system with summarized standards and models; helping teachers understand curriculum standards, students learn knowledge structures, and providing diverse feedback.

2 Related work

Scholars have conducted relevant studies in fields related to intelligent systems, including monitoring technology, control algorithms, and feedback mechanisms. Hanhua Yang proposed an IoT and big data-based approach for farm animal breeding environment monitoring. Juan Morales García et al. evaluated synthetic data in greenhouse climate control. Xuzhong Yan et al. proposed a real-time monitoring method for prefabricated building construction progress. Haytham Hijazi et al. used biometrics to assess code review quality. Fei Li et al. devised an output feedback controller for nonlinear multi-agent systems. Mohammadreza Sadeghighasami et al. designed a robust controller for switched systems. Chih Chiang Chen et al. proposed bounded control for planar systems. Ajul Dinesh et al. addressed uncertain linear systems with a guaranteed cost controller. Boyuan Zhang et al. enhanced CSI feedback in MIMO systems. Sou Nobukawa et al. studied noise impact on neural system resonance. These studies have solutions but need further improvement.

3 Method

3.1 Intelligent evaluation algorithm

Traditional teaching adopts "cramming" models with shortcomings such as limited ability to solve problems, lack of automatic question transformation, and poor scalability. Evaluation parameters are manually determined, which easily leads to subjective errors. Intelligent evaluation algorithms use computer programs, with core ideas leveraging neural connections and linear operations [1-2]. Steps include data preprocessing (such as removing noise and normalizing data using formulas), selecting models or algorithms (with a prediction formula applied), mining patterns [3-4], and optimizing parameters to reduce errors. Its purpose is to judge goal achievement through data analysis.

$$D^{`} = \left\{ x_i \middle| x_i \in D, \forall i, x_i is/not/mis\,\mathrm{sin\,g} \right\} \tag{1}$$

Unifying data of different attributes onto the same scale to avoid bias in assessment results due to dimensional differences. Common data normalization methods include min-max normalization and standardization. Its formula is as

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follows:

$$x_{normalized} = \frac{x - \min(x)}{\max(x) - \min(x)} \tag{2}$$

In intelligent assessment algorithms, appropriate models or algorithms are selected for analysis and modeling based on the characteristics and needs of the assessment object. The formula is as follows:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_n x_n + | \tag{3}$$

Among them, y is the prediction result,$\beta_0,\beta_1,...,\beta_n$is the regression coefficient, $x_1,x_2,...,x_n$ is the input feature, and | is the error term. It conducts accurate quantitative analysis of the evaluation object based on specific indicators and rules, and gives corresponding evaluation results.

3.2 Intelligent assessment and feedback system based on English digital education

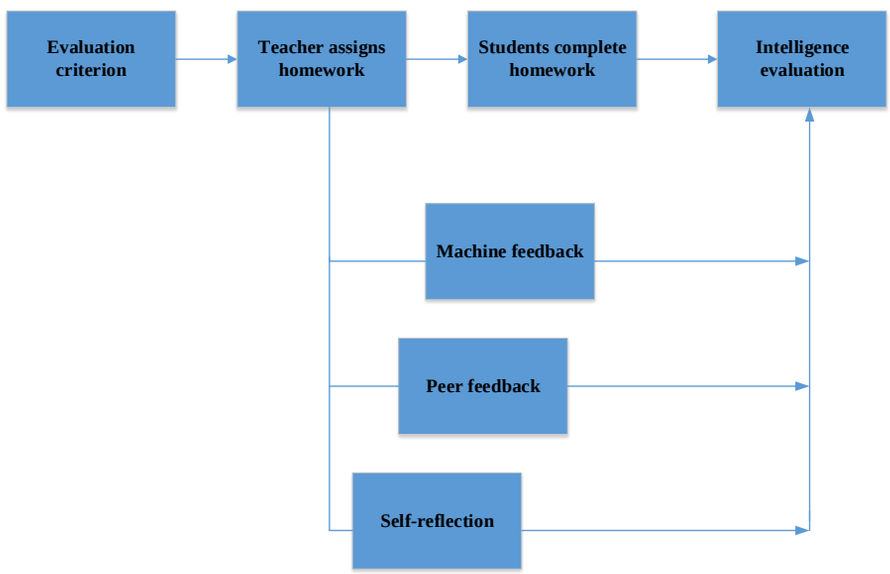

Figure 1 Intelligent evaluation and feedback system

Traditional teaching evaluation uses one-sided "cramming" methods, which fail to solve course implementation problems. Smart education requires multi-angle observation and timely application of evaluation, with multi-channel feedback [5-6]. The designed system (Figure 1) detects students' learning status and English performance, with targeted teaching activities. It stores digital teaching materials and teachers' teaching performance data through online collection, provides timely feedback to managers, and enables teachers and students to access relevant feedback from the database. Students receive grades upon submission; unsubmitted test papers or incomplete information are recorded to remind teachers to follow up [7-8]. A closed-loop network system is built through data processing, helping detect students' progress and teachers' course progress. It records problems in knowledge points, enabling teachers to improve teaching and promote students' ability development. This process is regarded as the construction of new concepts in learning behavior [9-10].

4 Results and discussion

4.1 Simulation of intelligent evaluation and feedback system

The simulation process of the intelligent evaluation and feedback system is as follows: (1) Set parameters (adjustments, state changes, etc.) and substitute actual test data into the program. (2) Traditional systems need parameter resetting; simulation uses computers, but real scenes are hard to fully virtualize, so hardware is strengthened. (3) It provides a reference for educators. (4) Same course categories have similar modules; functional areas are divided into simulation environment establishment and data exchange for resource sharing.

4.2 Simulation data analysis

Learners' oral expression fluency and speed control can be assessed by counting the number of words, sentences, etc., they speak or read continuously within a given time. According to the test results in Figure 2, it can be concluded that based on the number of continuous conversations of words and sentences in the specified time, the range of words in 5

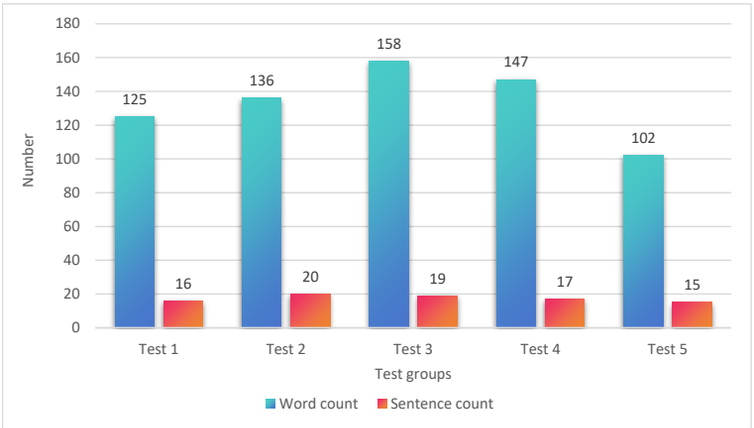

Figure 2 Oral fluency

consecutive conversations is 102-158, and the range of sentences in 5 consecutive conversations is 15-20 sentences. The system's feedback performance met the requirements and satisfied students' needs for basic information. When conducting rating assessments, the system demonstrated a high level of automatic reply capabilities and response speed.

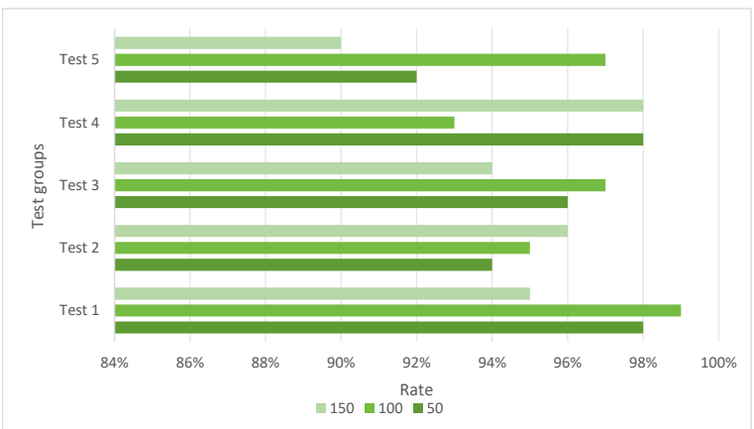

Figure 3 Word recognition accuracy

In this study, the words of the test object were briefly described and analyzed in detail. The specific results are shown in Figure 3. Among them, the recognition accuracy of 50 words can reach up to 98%, the recognition accuracy of 100 words can reach up to 99%, and the recognition accuracy of 150 words can reach up to 98%. This article can conclude through observation that this method is effective and practical. Judging from the statistical results, this algorithm can well reflect a certain correspondence between different amounts of data. Compared with other detection methods, it can more accurately distinguish the differences in the content and nature of sentences in the information sources.

By comparing learners' test results before and after using the intelligent assessment and feedback system, learners' personal progress in English digital education can be assessed. From the analysis of the data in Figure 4, it can be

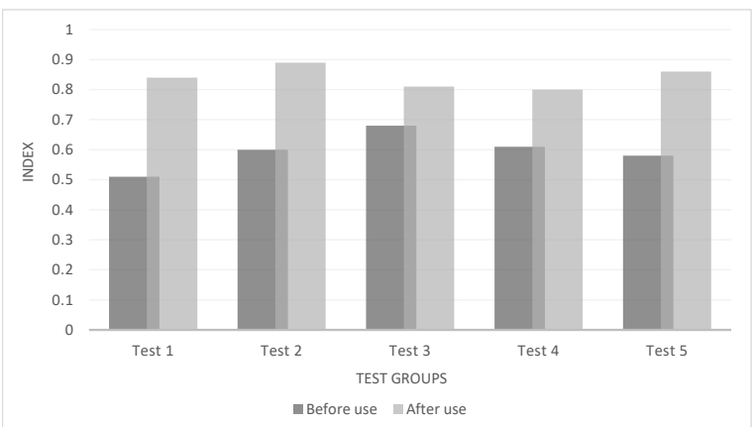

Figure 4 Personalized learning progress

concluded that in the field of digital education, the English teaching quality evaluation model and feedback system based on the intelligent evaluation system have significant application value, and the progress index before and after use has increased by about 0.3. These test results are closer to the actual situation. These results can provide reference for future development and play a positive and effective role in helping students improve their abilities and improve their personal files.

5 Conclusion

With the development of digital technology, intelligent evaluation and feedback systems are imperative. This paper reviews literature, draws on previous research, and builds a practical online evaluation system. It provides personalized feedback, helping teachers track students' status and make targeted adjustments. There are shortcomings, such as the lack of unified standards and sound theoretical support, and the model is not detailed enough due to limited data, time, and experience. For digital education, practical value is important. Future research will introduce diverse models to evaluate teaching, and the system will be popularized to improve students' abilities. Traditional teaching cannot meet needs; modern technology enables interaction and resource sharing to improve education quality.

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