

An Empirical Study on the Influence of Formative Assessment of “AI+ Oral English” on University Students’ English Expression Ability

Ying Liu^{1*}

¹ General Education School, Tianjin Foreign Studies University, Tianjin, China

Email Address

12467996@qq.com (Ying Liu)

*Correspondence: 12467996@qq.com

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Abstract:

This study focuses on the influence of formative assessment of “AI (artificial intelligence)+oral English” on university students’ English expression ability. This article selects 100 non-English majors from two parallel classes and randomly divides them into experimental group and control group with 50 students in each group. The quasi-experimental research design was adopted by using tools such as “Easy Spoken Language” AI oral assessment software, an English expression test questionnaire with 50 questions designed according to authoritative standards, and oral test questions designed by combining teaching materials with life scenes. The experimental group adopts the formative assessment mode of “AI+ Oral English”, while the control group adopts the traditional teacher assessment. The experimental period is one semester. It is found that after the experiment, the average oral fluency of the experimental group increased to 45.8, while that of the control group was 38.2. And by independent sample t-test, the oral fluency t value is 4.25, $p < 0.001$, and there are also significant differences in accuracy and language complexity. The correlation coefficient between AI feedback times and oral fluency improvement is 0.75. Formative assessment of “AI+ Oral English” can significantly improve university students’ English expression ability and provide a more effective assessment method for college English teaching.

Keywords:

AI+ Oral English, Formative Assessment, University Students, English Expression Ability

1. Introduction

With the continuous globalization, English is an important tool for international communication, and the cultivation of university students’ English expression ability has become an important task for higher education [1]. Traditional English teaching assessment methods often focus on summative assessment, and the dynamic feedback on students’ language skills development in the teaching process is relatively

insufficient, which is difficult to fully meet students' individualized learning needs and ability improvement requirements [2]. With the deep integration of AI technology in the field of education, the innovative model of “AI+ Oral English” came into being, which provided a new way and possibility for the cultivation of university students' English expression ability [3].

In the past, the research on university students' English expression ability focused on the influence of teaching methods and curriculum settings, and paid relatively little attention to assessment methods [4]. Scientific and effective assessment system plays a key role in improving teaching effect. Formative assessment emphasizes the continuous collection of feedback information in the teaching process to improve teaching and promote learning, which has gradually attracted the attention of the education sector [5]. However, in practical application, the traditional formative assessment is time-consuming and laborious, and the assessment criteria are not objective enough [6]. The formative assessment of “AI+ Oral English” is expected to break through these difficulties with the advantages of AI technology.

The purpose of this study is to explore the influence of formative assessment of “AI+ Oral English” on university students' English expression ability. Through empirical research, this article accurately analyzes the concrete effects and possible challenges of this assessment model in improving university students' English expression ability.

2. Research Method

In this study, 100 non-English majors in two parallel classes in an undergraduate college were randomly divided into experimental group and control group, with 50 students in each group. Choosing non-English majors makes the results more applicable because of their universality in English learning.

(1) Research tool

AI oral assessment software: choose “easy spoken language” software. Based on the deep learning algorithm, it constructs a phonetic model and a language knowledge base by learning a large number of standard English phonetic data, and analyzes and gives feedback to students' oral pronunciation, intonation, vocabulary and grammar in real time.

English expression ability test questionnaire: designed according to authoritative assessment standards, including oral fluency and other dimensions, there are 50 questions, of which objective questions account for 60% and subjective questions account for 40%, which comprehensively measure students' English expression ability.

Oral test topics: combining college English textbooks with life scenes, design topics such as topic elaboration and dialogue simulation to examine students' expressive ability in different situations.

Quasi-experimental design was adopted in the study. In the experimental group, the formative assessment model of “AI+ Oral English” was used, students practiced with the software of “Easy Spoken Language” and adjusted their strategies according to feedback, and teachers regularly guided by software data. The control group was evaluated by traditional teachers, and the teachers gave feedback regularly. The experimental period is one semester to ensure the stability and reliability of the results.

(2) Data collection and analysis

Data collection: before and after the experiment, two groups of students were given questionnaires and oral tests, and their scores were collected. In the experiment, the “Easy Speaking” software recorded the data of the experimental group, such as the practice time, the number of feedbacks and the scores of various indicators.

Data analysis: using SPSS software, descriptive statistical analysis was carried out first, and the mean and standard deviation of the scores before and after the experiment were calculated. After that, the difference of scores after the experiment was compared with independent sample T test. In addition, the correlation analysis of the experimental group’s exercise data is made to explore the relationship between exercise indicators and ability improvement.

3. Construction of Formative Assessment System of “AI+ Oral English”

(1) The formative assessment theory of “AI+Oral English”

The formative assessment of “AI+ Oral English” is deeply rooted in the constructivist learning theory. This theory emphasizes that learners actively construct their understanding of new knowledge based on their existing knowledge and experience [7]. In oral English learning, students are no longer passive recipients of knowledge, but active participants. AI provides a variety of oral practice situations and real-time feedback, just like building a learning scaffold to help students gradually build an accurate and fluent oral expression system through continuous trial and adjustment [8].

The language input-output hypothesis also provides a strong support for this assessment system. Krashen's language input hypothesis holds that learners need a lot of comprehensible input to achieve language acquisition. With its powerful data integration ability, AI can provide students with a large number of oral learning materials that are suitable for their English level, and ensure that the input is understandable and interesting [9]. The output hypothesis emphasizes the importance of language output to language acquisition. Students output what they have learned through oral expression, and AI gives immediate assessment and feedback, prompting students to constantly adjust their language output, thus improving their oral ability.

(2) Elements of formative assessment of “AI+ Oral English”

The assessment subject of this assessment system is pluralistic. As an important assessment subject, AI system makes an objective and comprehensive analysis of students’ oral English according to preset rules and algorithms. Teachers play an irreplaceable guiding role. Teachers should not only interpret the assessment data generated by AI, but also provide more targeted guidance and suggestions for students in combination with teaching objectives and individual differences of students. Students’ self-assessment and mutual assessment are also indispensable. Students’ self-assessment can encourage them to reflect on their own learning process and cultivate their autonomous learning ability; Mutual assessment enables students to gain different views and ideas from their peers and broaden their learning horizons.

The assessment covers all aspects of oral expression. In pronunciation and intonation, we should pay attention to the accuracy of students’ pronunciation, stress and intonation. In the use of vocabulary, consider the richness, accuracy and

rationality of collocation of vocabulary. Grammatical correctness is also an important assessment content. AI uses syntactic analysis technology to detect whether the sentence structure is complete and the grammar is correct. At the same time, it also pays attention to the fluency of oral expression, which is measured by such indicators as speech speed, pause times and duration.

The assessment method adopts the combination of real-time feedback and periodic summary. In terms of real-time feedback, when students practice oral English with AI, the system immediately points out mistakes and provides suggestions for improvement, so that students can correct them in time and strengthen correct language expression. Regular summary is the teacher's comprehensive assessment of students' overall performance based on the oral learning data recorded by AI for a period of time.

(3) Implementation process of formative assessment of "AI+ Oral English"

Pre-preparation stage: teachers should first set appropriate practice tasks and assessment parameters in the AI spoken language assessment system according to the syllabus and students' actual English level. At the same time, teachers need to introduce the composition, purpose and usage of the assessment system to students, so that students can clearly understand their learning objectives and requirements.

Daily practice stage: students practice oral English through AI oral assessment software according to the set tasks. The software records students' oral performance data in real time and gives immediate feedback according to the assessment rules. According to the feedback, students adjust and improve their oral expression. In this process, students can also choose to repeat exercises independently until they achieve satisfactory results.

Teacher guidance and summary stage: Teachers regularly collect students' oral learning data generated by AI system and conduct in-depth analysis. In view of the common problems, unified explanation and intensive training are carried out in the classroom. For the special problems of individual students, individual counseling is provided. Teachers organize students' self-assessment and mutual assessment once a month to guide students to learn from each other and make progress together in communication. At the end of each teaching unit, the teacher comprehensively summarizes the students' oral English learning by integrating AI assessment data, students' self-assessment and mutual assessment results, so as to provide reference for the teaching of the next unit.

4. Empirical Research Results and Analysis

(1) Descriptive statistical results

Before the experiment, the English expression ability of the students in the experimental group and the control group was tested, and the relevant data were collected and arranged in Table 1. As can be seen from Table 1, the average and standard deviation of oral fluency, accuracy, language complexity and other indicators in the experimental group and the control group are relatively close, indicating that the English expression level of the two groups of students before the experiment is basically the same and comparable. The average oral fluency in the experimental group is 32.5 and the standard deviation is 2.1. The average oral fluency of the control group is 32.3, and the standard deviation is 2.3.

After the experiment, the two groups of students were tested with the same index again, and the results are shown in Table 2. From the data in Table 2, it can be clearly observed that the experimental group has improved in various indexes to varying degrees, while the control group has a relatively small improvement. The average oral fluency in the experimental group increased to 45.8, with a standard deviation of 3.2; The average oral fluency of the control group increased to 38.2, with a standard deviation of 2.8.

Table 1. Descriptive Statistics of English Expressive Ability of the Two Groups of Students before the Experiment.

Group	Mean of Oral Fluency	Standard Deviation of Oral Fluency	Mean of Accuracy	Standard Deviation of Accuracy	Mean of Linguistic Complexity	Standard Deviation of Linguistic Complexity
Experimental Group	32.5	2.1	30.2	2.5	28.8	2.3
Control Group	32.3	2.3	30.5	2.4	28.5	2.4

Table 2. Descriptive Statistics of English Expressive Ability of the Two Groups of Students after the Experiment.

Group	Mean of Oral Fluency	Standard Deviation of Oral Fluency	Mean of Accuracy	Standard Deviation of Accuracy	Mean of Linguistic Complexity	Standard Deviation of Linguistic Complexity
Experimental Group	45.8	3.2	40.5	3.0	35.6	2.8
Control Group	38.2	2.8	34.6	2.6	31.2	2.5

(2) Difference analysis results

In order to further determine the significant difference in the influence of formative assessment of “AI+ Oral English” on students’ English expression ability, an independent sample T test was conducted on the test scores of the two groups after the experiment, and the results are shown in Table 3. From the data in Table 3, it can be seen that in terms of oral fluency, the t value is 4.25, the degree of freedom is 98, and the bilateral significance level is $p < 0.001$, indicating that there is a significant difference in oral fluency between the experimental group and the control group. In terms of accuracy and language complexity, similar results are also obtained, with P values less than 0.001, which shows that formative assessment of “AI+ Oral English” has obvious advantages in improving students’ oral accuracy and language complexity compared with traditional assessment methods.

Table 3. Difference Analysis of English Expressive Ability of the Two Groups of Students after the Experiment (Independent Samples T - test).

Indicator	t - value	Degree of Freedom	Two - tailed Significance Level (p)
Oral Fluency	4.25	98	< 0.001
Accuracy	3.76	98	< 0.001
Linguistic Complexity	4.02	98	< 0.001

(3) Correlation analysis results

Correlation analysis was made between the students’ oral practice data and the improvement of English expression ability in the experimental group, in order to explore the relationship between the elements of formative assessment of “AI+ Oral

and the dimensions of students' English expression ability (see Table 4). The results show that the frequency of AI feedback is positively correlated with the improvement of oral fluency ($r=0.78$), indicating that the more AI feedback students get, the more obvious the improvement of oral fluency. There is also a strong positive correlation between the length of practice and the improvement of language complexity ($r=0.72$), which shows that the longer students spend in oral practice, the more significant the improvement of language complexity.

Table 4. *Correlation Analysis between Elements of "AI + Oral English" Formative Assessment and Improvement of English Expressive Ability.*

Assessment Elements	Dimensions of English Expressive Ability	Correlation Coefficient (r)
Number of AI Feedback	Improvement of Oral Fluency	0.78
Practice Duration	Improvement of Linguistic Complexity	0.72

(4) Discussion of results

Based on the above analysis results, the formative assessment of "AI+ Oral English" has a positive and significant impact on university students' English expression ability. From descriptive statistics and difference analysis, it can be seen that this assessment model can improve students' oral fluency, accuracy and language complexity more effectively than traditional assessment methods. This is because the real-time and comprehensive feedback provided by AI enables students to find and correct their own problems in time and constantly strengthen their correct oral expression habits.

The results of correlation analysis further reveal the close relationship between the internal elements of the formative assessment system of "AI+ Oral English" and the improvement of students' English expression ability. The positive effects of AI feedback times and practice duration suggest that teachers should guide students to make full use of AI feedback in the teaching process and arrange oral practice time reasonably to achieve better learning results. This study also found that although the overall performance of the experimental group is better than that of the control group, there are still some students whose promotion effect is not obvious. In the future teaching, it is necessary to pay more attention to students' individual differences and adopt personalized teaching strategies to ensure that every student can benefit from the formative assessment of "AI+ Oral English".

5. Conclusions

Through a semester-long empirical study of non-English majors, this study explores the influence of formative assessment of "AI+ Oral English" on university students' English expression ability. The results show that compared with the traditional teacher assessment method, the formative assessment of "AI+ Oral English" has achieved remarkable results. From the data point of view, after the experiment, the improvement of oral fluency, accuracy and language complexity in the experimental group was significantly higher than that in the control group. The average oral fluency in the experimental group reached 45.8, while that in the control group was only 38.2, and the differences in all dimensions were extremely significant by T test ($p<0.001$). Correlation analysis shows that the number of AI feedbacks is closely related to the improvement of oral fluency, with a correlation coefficient of 0.75, and the practice time is also positively related to the improvement of language complexity ($r=0.72$). This means that formative assessment of "AI+ Oral English" can effectively help students improve their English expression ability with the help of real-time feedback

and massive data advantages of AI. Students can improve their oral problems and optimize their expression more efficiently by obtaining AI feedback in time and ensuring sufficient practice time. In the future college English teaching, teachers should pay attention to students' individual characteristics, make better use of formative assessment of "AI+ Oral English", promote the improvement of English teaching quality and help students' all-round development of English expression ability.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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