



Exploring the impact of artificial intelligence empowering mobile devices on the blended teaching behaviors of English teachers and its role in enhancing students' oral language skills

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SUMMARY: *In the context of the development of artificial intelligence and mobile learning, it remains to be empirically verified how university English oral language teaching can restructure teachers' behaviors and enhance students' oral language abilities. This paper introduces a mobile learning platform with intelligent assessment and learning analysis functions into the university English oral language course, and constructs a blended teaching model based on the BOPPPS-PADD framework. It adopts a non-equivalent pre-test-post-test quasi-experiment and combines questionnaires and interviews for a mixed study. The results show that artificial intelligence empowering mobile devices promotes teachers' behavioral changes in task design, classroom interaction, and formative evaluation, and enhances students' participation; the total score of the experimental group students' oral language improved compared to the pre-test, and they made significant progress in fluency, accuracy, pronunciation, and conversation dimensions, and the platform usage behavior was positively correlated with the improvement of oral language. The study shows that artificial intelligence empowering mobile devices helps optimize the blended teaching of university English oral language.*

Povzetek: This study focused on the university English oral communication course and introduced artificial intelligence to empower the mobile learning platform. A BOPPPS-PADD blended teaching model was constructed. The analysis was conducted through a pre-test and post-test quasi-experiment combined with questionnaires, interviews, and platform logs. The results showed that the empowerment of AI through mobile devices enabled teachers to pay more attention to task chains and formative evaluation in their classroom designs. Students' oral fluency, accuracy, and related indicators all showed clear improvement. Platform use was positively correlated with learning engagement and gains in academic performance.

KEYWORDS: *Artificial intelligence empowerment; Mobile devices; Blended teaching; English teachers' teaching behaviors; Students' oral language ability; College English oral language teaching*

1 Introduction

With the influence of information technology on the classroom teaching environment in colleges and universities, college English oral class has begun to shift from the traditional centralized teaching based on face-to-face teaching by teachers to the hybrid teaching combining online and offline. The traditional model built almost entirely around classroom

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<https://doi.org/10.65102/is2026300>

lectures is giving way to blended formats that mix online work with face-to-face sessions. With smartphones, tablets and stable campus networks now widely available, students can open course materials, work on speaking tasks and collaborate with peers whenever they have time, whether on the way to class or in their dormitories. These conditions make it possible to build a learning environment for spoken English that is more ubiquitous, more personalised and more focused on the learning process. In everyday practice, however, many teachers still organise their lessons around a familiar “explanation–practice–assessment” routine. Students have limited chances to speak at length, classroom interaction often remains at a superficial level, and regular oral practice after class is hard to maintain. The advantages of blended teaching are therefore far from being fully realised.

In recent years, with the continuous development of artificial intelligence technology, the ability of speech recognition is gradually enhanced, the function of error correction and evaluation is improved, and the function of learning analysis is strengthened. As a result, mobile devices are no longer simply data carriers, but learning partners that can provide intelligent feedback and track learning situation [1]. The mobile learning platform based on AI technology can dynamically capture students' oral habits, including the number of questions, time and completion rate, provide instant voice feedback and personalized guidance, and provide visual learning reports for teachers to reference and improve teaching strategies. Compared with the original online task assignment, the online and offline teaching method of combining online and offline teaching based on marking homework, Compared to the earlier hybrid teaching model that mainly relied on online platforms to issue tasks and collect assignments, the empowerment of mobile devices by artificial intelligence provides a new technical support point for teachers to reconfigure their teaching behaviors in the pre-class, in-class, and after-class periods, and is expected to promote deep changes in teachers' teaching decision-making methods and classroom behavior patterns while enhancing students' oral language proficiency [2, 3].

Existing studies generally affirm the positive impact of mobile learning, hybrid teaching, and intelligent oral language assessment on students' English oral language proficiency, emphasizing that technology intervention can increase oral practice opportunities, improve learning motivation and self-efficacy. However, from a research perspective, most work focuses on students' learning outcomes and experiences, while there is relatively insufficient attention to how teachers reconfigure hybrid teaching behaviors in the context of artificial intelligence empowerment [4, 5]. Especially in college English oral language classes, how teachers design differentiated oral language tasks based on the learning data generated by mobile devices, organize online and face-to-face interactions, implement diverse evaluations and formative feedback, and how these behavioral changes affect students' oral language ability improvement through intermediary paths, still lack systematic and detailed empirical analysis [6, 7].

In this context, this study takes the college English oral language course supported by artificial intelligence-enabled mobile devices as the object, based on the actual teaching situation in Chinese universities, focusing on two core dimensions: "teacher's hybrid teaching behavior" and "students' oral language ability improvement". By introducing a mobile learning platform with intelligent assessment and learning analysis functions, a hybrid teaching plan covering pre-class preview, in-class interaction, and after-class expansion is constructed to examine the changes in teachers' classroom design, teaching organization, classroom interaction, and evaluation feedback before and after the intervention of technology, and to analyze the relationship between these changes and students' oral language ability development. The study aims to answer: With the support of artificial intelligence-enabled mobile devices, what meaningful changes have occurred in English teachers' hybrid teaching behaviors; to what

extent these changes promote the overall improvement of students' oral language proficiency by increasing oral practice opportunities, optimizing feedback mechanisms, and enhancing learning participation.

This study is guided by a mixed research approach, comprehensively using quantitative and qualitative methods, and through the integrated analysis of pre-test and post-test data, learning process data, and teacher-student interview materials, it strives to present the mechanism of artificial intelligence-enabled mobile devices on English teachers' hybrid teaching behaviors and their role in improving students' oral language ability from the perspective of the chain of teaching behavior - learning process - oral language results. On the one hand, efforts are made to enrich the research perspective of blended oral teaching in the context of artificial intelligence and mobile learning, making up for the deficiency of previous studies that focused on learners and relatively neglected the systematic changes in teachers' teaching behaviors; on the other hand, this study provides reference experiences and decision-making references for universities in planning university English oral courses and supporting teachers to carry out teaching innovations using artificial intelligence and mobile devices.

2 Research Methods

2.1 Research Design: Mixed Research Orientation and Quasi-Experimental Scheme

This study adopts a mixed research orientation and conducts quantitative quasi-experiment and qualitative research concurrently to present the impact of AI empowerment of mobile devices in blended oral teaching of university English. The quantitative part adopts a non-equivalent pretest-posttest design, setting up experimental and control groups in university English oral courses of multiple universities. Both groups are arranged in natural classes to avoid interference caused by arbitrary class splitting. The experimental group introduced the AI-enabled mobile learning platform within the 16-week teaching cycle. Through this platform, pre-class preparation tasks, on-the-spot speaking practice during class and extended speaking activities after class were all woven into a blended teaching sequence structured by the BOPPPS–PADD framework; the control group continues to use conventional textbooks and multimedia courseware, mainly relying on face-to-face teaching and basic online resource sharing, without providing personalized feedback and learning analysis based on AI. The qualitative part includes teacher interviews, student focus group interviews, and classroom observation records, used to capture changes in teachers' teaching behaviors and students' learning experiences, and to compare and verify the quantitative results during the data analysis stage, from the triangulation of methodological perspectives to enhance the credibility of the research conclusions.

2.2 Research Field, Research Subjects and Sample Composition

The research field of this study is university English oral courses of several applied and research-oriented undergraduate colleges in the western region, with a total teaching period of one semester of 16 weeks. The research subjects of the quantitative part are undergraduate students participating in the blended oral courses, with 480 valid questionnaires distributed and recovered, covering accounting, auditing, and financial management majors. Based on the arrangement of instructors and teaching classes, the participants are divided into experimental and control groups, with 240 students in the experimental group and 240 students in the control group, both of which are roughly balanced in size. From the sample structure, there are 246 male students, accounting for 51.3%, and 234 female students, accounting for 48.8%; from the

professional distribution, there are 169 students in accounting (35.2%), 149 students in auditing (31.0%), and 162 students in financial management (33.8%); from the age structure, there are 113 students aged 18, 121 students aged 19, 130 students aged 20, and 116 students aged 21 (see Table 1), which ensures the sample size while maintaining a certain degree of representativeness.

Based on this, a 168-person oral test sub-sample is formed from the students in the experimental group who completed the complete pretest and posttest, for analyzing the specific effect of AI empowerment of mobile devices in the blended teaching context on students' oral performance; the data of students in the control group who completed the pretest and posttest are also included in the analysis, forming a paired inter-group comparison sample to test the differences in oral scores under different teaching conditions. The qualitative part adopts purposive sampling, selecting 30 front-line university English teachers from those participating in this study. These 30 teachers all completed the teacher questionnaire and participated in semi-structured interviews and classroom observations, and from the students in the experimental and control groups, several representative student cases are selected from each group, totaling 18 people, to participate in semi-structured interviews and classroom observations, to enrich the understanding of teachers' blended teaching behaviors and students' learning experiences and perception of oral ability, and to provide contextualized explanatory support for the quantitative results.

Table 1: Basic Information of the Research Sample (N = 480)

Category	Variable	Frequency	Percentage/%
Gender	Boy	246	51.3
	Female	234	48.8
Professional	Accounting	169	35.2
	Auditing	149	31.0
	Financial Management	162	33.8
Age	18 years old	113	23.5
	19 years old	121	25.2
	20 years old	130	27.1
	21 years old	116	24.2

2.3 Teaching Intervention Plan: The application process of AI-powered mobile devices in the mixed oral English teaching

This study is based on the BOPPPS classroom model and the PADD participatory classroom structure. Relying on an AI-supported mobile learning platform, it integrates all the pre-class, in-class, and post-class stages to form a relatively complete university English oral mixed teaching process. The overall design concept is shown in Figure 1. The teaching activities were organized into six stages: bridge in, clarification of objectives, pre-test, participatory learning, post-test and summary with reflection. At pre-test and post-test stage, the teacher used mobile devices to release tasks, collect learning data and give feedback, so that face-to-face instruction and online learning were linked together as a coherent process.

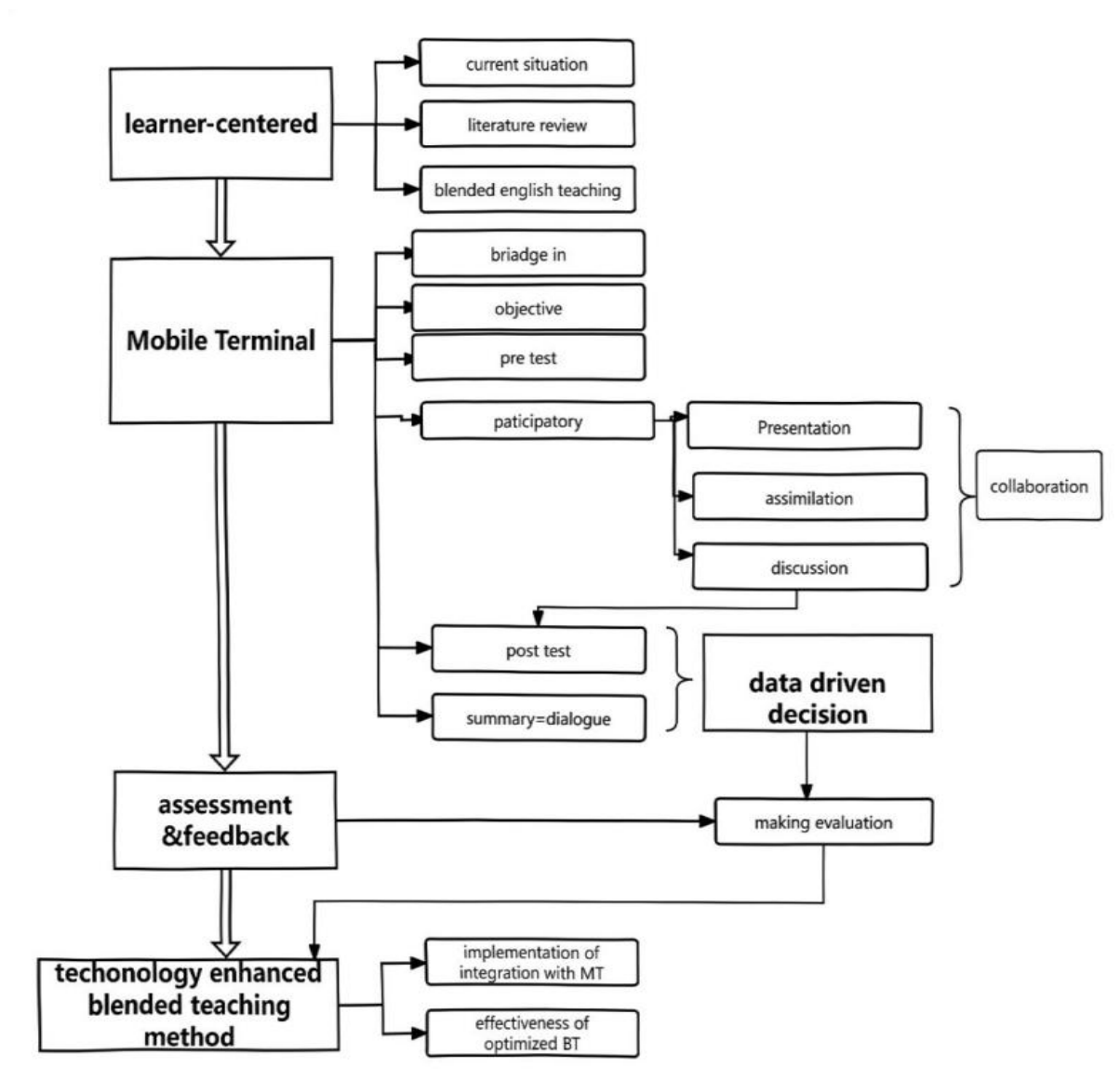


Figure 1: The framework of blended teaching design for college English oral communication supported by artificial intelligence and mobile devices (BOPPPS-PADD)

Before class, the teacher typically uses mobile devices to send students short situational videos, key vocabulary items and functional sentence patterns as preparation tasks. At the same time, a brief diagnostic speaking quiz based on speech recognition and automatic scoring is arranged at this stage. The platform generates learning profiles based on students' performance in pronunciation, fluency, and grammar usage. Teachers adjust the difficulty of classroom tasks and group arrangements accordingly, providing more specific data basis for subsequent tiered activities.

In the in-class stage, classroom activities are carried out according to the "presentation - assimilation - discussion - dialogue" process of PADD, as shown in Figure 2. At the first stage, the teacher first delivers a concise explanation of key concepts, then distributes oral task sheets via mobile devices. At the second stage, students spend two minutes summarizing and reflecting on the teacher's explanations before engaging in interactive dialogues with AI mobile devices. The third phase involves group discussions, two-person conversations, and role-playing exercises based on these dialogues to enhance oral proficiency. After students

complete the recording and submit it, the system immediately gives voice scoring and correction prompts; at fourth stage, teachers explain and provide targeted feedback based on the common problems presented by the platform, which to a certain extent expands the breadth of classroom interaction and deepens the level of student participation.

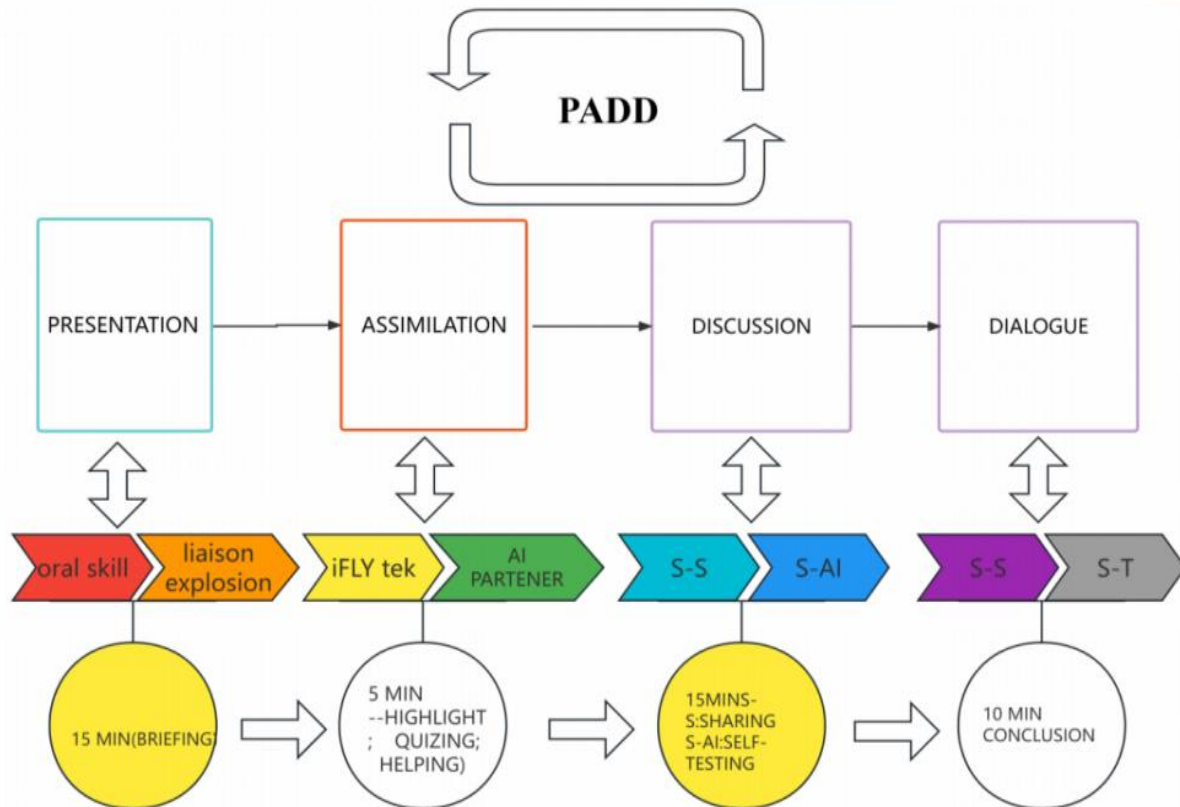


Figure 2: The teaching process of college English oral communication classes supported by artificial intelligence and enabled by PADD on mobile devices

After class, the teacher posts the extended oral assignment and reflection log on the platform, allowing students to complete the role-play either online or offline. The platform presents the practice times, completion status, and learning trajectory of each student in a visualized manner and generates an academic situation analysis and individual as well as class learning reports. Based on this, the teacher conducts personalized tutoring and teaching diagnosis and reflection. In turn, students can also fully utilize mobile devices to repeatedly view historical records, compare previous results, and achieve "diagnosis - practice - feedback - re-practice" through such a method. Through this approach, artificial intelligence enabled by mobile devices brings more oral communication time for students and promotes the overall transformation of teachers' teaching design, classroom teaching strategies, and tracking evaluation strategies.

2.4 Research Tools: Assessment Tools for Teacher Behavior Impact and Oral Language Ability (Oral Assessment, Questionnaire, and Interview)

This study focuses on two core dimensions: "changes in teachers' blended teaching behaviors" and "improvement in students' oral language ability". In terms of specific approaches, it uses

various research tools such as oral assessment, questionnaire scales, and semi-structured interviews. At the same time, it also collates the process data of the mobile learning platform to cross-verify the changes in teaching behaviors and their impact on learning outcomes from multiple perspectives.

In terms of oral assessment, the study organizes pre-tests and post-tests at the beginning and end of the intervention, using contextualized college English oral test tasks, covering types such as situational dialogues, situational descriptions, and expression of viewpoints. Scoring is conducted using an analytical scale, scoring students' performance in multiple dimensions such as fluency, pronunciation and intonation, grammatical and lexical accuracy, discourse coherence, and the use of communication strategies. Two trained grading teachers scored the assignments separately and calculated the average score, which ensured the consistency and fairness of the scoring. In the test process, the evaluation scale had high credibility and validity, and could be used to measure the oral ability in this study.

The questionnaire included two questionnaires for teachers and students. Among them, the teacher questionnaire mainly investigated teachers' behaviors, opinions and feelings in using artificial intelligence technology to support mobile terminals to carry out blended learning, involving academic arrangement, classroom interaction, formative evaluation methods, the application of mobile terminals and the resulting cognitive impact. Students' questionnaires were designed around their frequency of using mobile devices, their degree of participating in classroom teaching, their motivation and confidence in English learning, and their satisfaction with the blended language teaching method and the feedback mechanism of artificial intelligence. After pre-testing and item analysis, the Cronbach α value of the internal consistency coefficient was between 0.844 and 0.956, indicating that the two scales had good reliability and stable structure.

In terms of qualitative tools, through two types of semi-structured interview outline of teachers and students; The discussion focused on "how to integrate the specific operation links and experience of foreign language teaching with mobile terminals", "role exchange and communication form change in class", "the influence of AI feedback on teaching and learning", and "problems in the implementation process and improvement measures". The interviews were conducted in the form of one-to-one interviews or group interviews, supplemented by course observation records and platform usage logs, which helped to deeply understand the reasons behind the quantitative data and its operation mechanism from the dual perspectives of teachers and students, and provided a rich qualitative background for interpreting how AI helps smartphones to enter the hybrid education context and play an impact.

2.5 Data Collection Procedure and Ethical Considerations

The data collection phase of this study was divided into three parts: the preparation phase, the implementation of the intervention phase, and the post-finishing phase. Before the beginning of the semester, the instructor first introduced the purpose and overall plan of the study to the students, and then distributed the oral output pre-test questions and the basic questionnaire, and used the mobile phone recording software to record and submit. At the same time, the instructor would also obtain their basic personal information. After that, the whole semester was the stage of intervention behavior. After each teaching unit, the data information of pre-class learning, classroom interaction and post-class consolidation using AI-based intelligent terminals, such as time, frequency and completion rate, were automatically recorded. However, teachers can add some additional classroom observation materials according to their needs. At the end of the school year, an oral final examination and a questionnaire survey were conducted again, and a number of teachers and students were invited to conduct semi-structured interviews to form a contextual supplement to the quantitative results. In the later stage, the collected oral test scores,

questionnaires, learning platform logs and interview records were sorted and coded, and the data that were seriously missing or did not meet the needs of this study were deleted, so as to ensure the validity of the data.

In terms of ethics, this study strictly followed the principle of informed consent. On the premise of voluntary solicitation, all participants signed an informed consent form to prove that they were aware of and agreed to participate in this project. At the same time, pay attention to the protection of personal privacy and information security, all the information is replaced by a code name, and the information related to the network platform obtained will be desensitized to the privacy information. The research process was supervised in the school's educational administration and research management system to ensure that the data collection and use were in line with the ethical code of educational research.

2.6 Data Analysis Methods and Quality Control

In this study, the social science statistical software SPSS 25.0 was used to analyze the data of the questionnaire and oral expression evaluation, and the background variables and education situation were mainly used to make descriptive statistics, and the basic situation and distribution characteristics of the participants were analyzed. Firstly, the reliability analysis and preliminary factor analysis of the questionnaire for teachers and students were conducted to investigate the internal consistency level and construct validity of the scale. The total score and scores of each dimension of language ability of the experimental group and the control group were compared by paired sample t-test before and after the pre-test and post-test, and the development status of the two groups of students under different teaching situations was compared by independent sample t-test. In addition, before analyzing the impact of smart technology on the use of mobile devices, teachers' teaching behavior and students' language ability, Pearson correlation will be used to analyze the correlation degree between each variable, and multiple regression equations will be established as appropriate. A significance level of $\alpha=0.05$ was taken for all hypothesis tests. Efficacy was evaluated by power index.

For qualitative analysis, nvivo 12 was used in this study to encode and summarize the quality analysis part of teacher interviews, student focus group interviews and classroom observation records. The coding framework was based on the research questions and theoretical models, with an emphasis on openness. Initial open coding was conducted first, and concepts related to teachers' blended teaching behaviors, students' learning experiences, and perception of oral ability were identified. Then, axial coding was used to aggregate similar concepts into several core categories, and themes such as "changes in teaching behaviors", "learning participation and motivation", and "AI feedback experience" were formed. To enhance the credibility of the analysis, the research team members conducted cross-coding of some texts, compared and discussed the coding differences, and reached a consensus. At the same time, typical original sentences were retained as supporting materials.

In terms of data quality control, after the quantitative data were entered, missing values and outliers were screened. Obviously invalid questionnaires and invalid oral test recordings were removed, and a small number of random missing were processed by list deletion method or average imputation method. Before conducting t-tests and correlation analyses, the normality and homogeneity of variance of the main variables were tested. For cases that did not meet the prerequisites, corresponding robust methods or non-parametric tests were used for rechecking. The oral scores were independently completed by two trained raters, and the error in scoring was monitored by calculating the correlation coefficient and consistency index. The qualitative part was verified through multiple triangulation of data sources, researchers, and methods, comparing and contrasting the questionnaire statistical results, changes in oral scores, platform learning logs, and interview themes to enhance the reliability and interpretability of the research

conclusions.

3 Results

3.1 Quantitative Changes in Teacher Blended Teaching Behaviors Affected by AI-enabled Mobile Device Enabling

Based on teacher questionnaires and classroom observation data, this study conducted quantitative and descriptive analysis of the changes in teacher blended teaching behaviors before and after the intervention of AI-enabled mobile devices from dimensions such as classroom design and task arrangement, classroom interaction and learning support, evaluation methods, technology application and resource utilization, and feedback mechanisms. Overall, after the intervention, the scale scores of teachers in "task-oriented classroom design", "activity-based, participatory classroom organization", "multifaceted formative evaluation", "regular integration of mobile devices", and "timely feedback and process guidance" all showed varying degrees of improvement, indicating that AI-supported mobile terminals are not merely a tool for presenting course materials, but gradually embedded into teachers' daily teaching decisions and behaviors. The main characteristics of the teacher's teaching behavior transformation can be summarized in the aspects shown in Table 2.

Table 2: Analysis of Changes in Teacher Teaching Behavior Characteristics

Behavioral dimension	Characteristics of traditional classrooms	Characteristics of blended learning	Change Description
Role positioning	Knowledge transmitter	Learning facilitator, learning partner	Teachers have shifted from being one-way lecturers to facilitators of the learning process.
Teaching organization method	Mainly through lecturing	Organize the class based on tasks and activities	Classrooms have transformed from "lecture - note-taking" to "task - interaction - presentation".
Evaluation method	Final comprehensive evaluation	Process-oriented and diversified formative assessment	Focusing more on the learning process and continuous performance
Technology application	Mobile devices serve as auxiliary display tools.	Mobile devices have become the key medium for both classroom and extracurricular learning	Technology has shifted from being "optional" to becoming an essential part of the teaching process.
Resource utilization	Mainly relying on fixed textbooks and lecture notes	Comprehensive platform resources, micro-lessons, corpus, and other diverse resources	The teaching content is more diverse and the scenarios are closer to real communication.
Feedback mechanism	The main approach is to conduct concentrated feedback after class.	Utilize the platform to achieve immediate feedback and individualized guidance	The feedback is more timely and targeted.

Based on the overall behavioral changes, the attitude structure of teachers towards the application of mobile devices shows certain differences. Through cluster analysis of teacher

questionnaire data, the samples were divided into three categories: traditional conservative type, cautious use type, and active innovative type. The proportion distribution of teachers' attitudes is shown in Figure 3, where the traditional conservative type accounts for 26.7%, the cautious use type accounts for 40.0%, and the active innovative type accounts for 33.3%. From the combination of questionnaire and interview results with platform usage records, most teachers have accepted the integration of AI-enabled mobile devices into oral mixed teaching to varying degrees and have begun to try using this tool in the classroom. However, there are still significant differences in the depth of specific use and innovative practices. Teachers who are more inclined towards active innovation are more accustomed to using platform data and intelligent feedback to adjust classroom sessions and individual tutoring; cautious users mostly use mobile devices as auxiliary tools for assigning tasks or presenting materials; while traditional conservative teachers have relatively limited trust and dependence on related technologies, and their usage frequency and function expansion are relatively conservative.

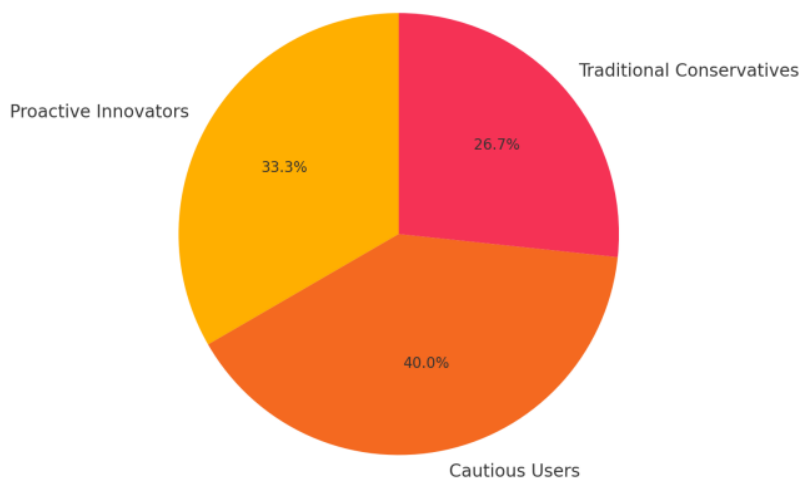


Figure 3: Distribution of Teachers' Attitudes towards Mobile Device Applications

It is notable that the improvement in indicators related to the feedback mechanism was particularly significant. Based on the platform log statistics and combined with teacher interviews, it can be seen that after implementing blended teaching, teachers identified and responded to students' learning difficulties at a significantly faster pace, and the overall feedback timeliness increased by approximately 85% compared to before the intervention; the average satisfaction score of students with teachers' explanations and guidance was 4.21 out of 5. These data indicate that with the support of AI-enabled mobile devices, teachers demonstrated more open and flexible characteristics in teaching organization and evaluation methods. Through more frequent and higher-quality immediate feedback, they strengthened the connection with students and created a more favorable environment for increasing students' oral output opportunities and promoting oral language proficiency improvement.

3.2 Quantitative Results of the Role of AI-Enabled Mobile Devices in Improving Students' Oral Language Proficiency

In terms of overall oral language proficiency, the pre-test results showed that there was no significant difference in oral language scores between the experimental group and the control group, and the means of both groups were close, both at a moderately low level. After the introduction of AI-powered mobile devices and the implementation of blended oral English teaching for 16 weeks, the comprehensive ability of oral English of the students in the control

group was significantly improved, with an average score of about 20 points higher in the pre-test and post-test, while the control group only showed a slight increase. As can be seen from Figure 4, there is no difference between the scores of the first group and the second group, and the difference between the two groups is statistically significant. However, the scores of the experimental group gradually approach to high scores, and the t value indicates that the difference is statistically significant. It can be seen that the application of AI technology plays an important role in improving the comprehensive ability of students. The control group was still mainly concentrated in the medium score range and did not show a similar significant leap, further supporting the existence of the teaching intervention effect.

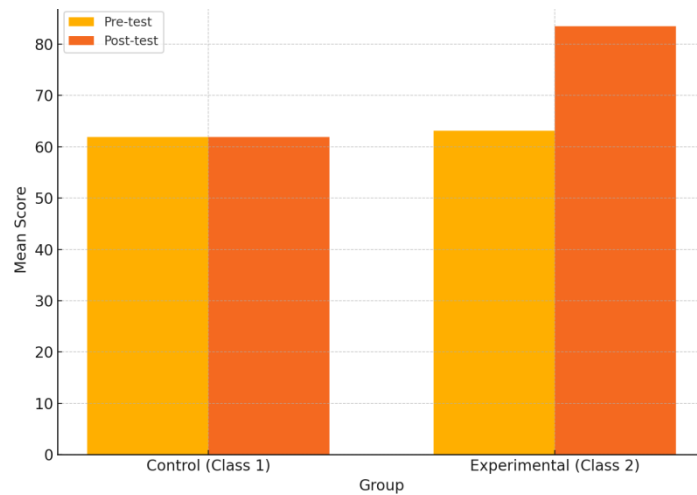


Figure 4: Comparison of total scores of oral language before and after testing between the experimental group and the control group

From a more detailed statistical test, based on the paired sample t-test of the pre-test and post-test, the improvement in the total score of oral language of the experimental group students reached a highly significant level. While the control group also showed a certain degree of improvement, the effect size was significantly smaller. The statistical test results of the group differences are shown in Figure 5.

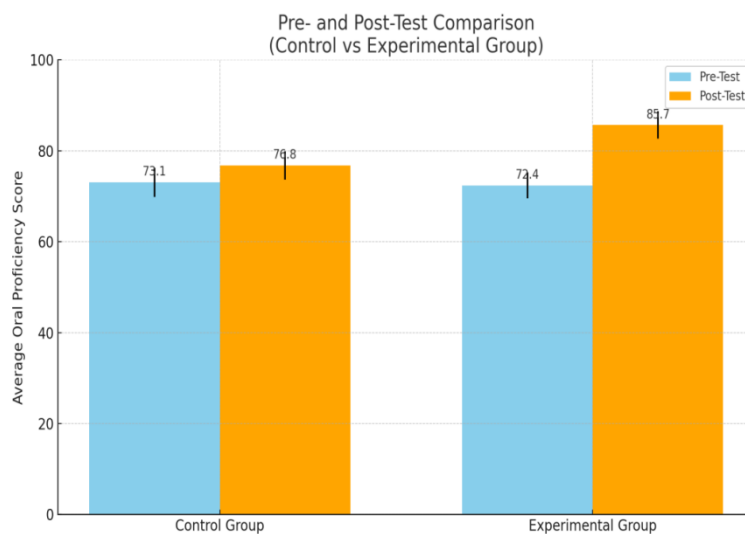


Figure 5: Results of t-test for the total scores of oral language of the experimental group and the control group before and after the test

This indicates that, under the condition of maintaining the original levels basically consistent, introducing AI-powered mobile devices and reconfiguring the blended oral language teaching process significantly enhanced students' oral output ability and comprehensive expression level in real situations. Further combined with dimensional analysis, it can be seen that students showed significant improvements in four core indicators: fluency, accuracy, pronunciation, and conversation. Taking the 168 students in the experimental group who participated in the pre-test and post-test as an example, their average fluency score increased from 49.08 to 79.08, accuracy from 50.80 to 79.30, pronunciation from 46.21 to 78.64, and conversation from 40.31 to 77.62. The standard deviations of each dimension were also narrowed, indicating that students' scores not only moved overall but also had a smaller internal difference.

To present more intuitively the specific effects of AI-powered mobile devices on the various dimensions of students' oral language, this study compiled the descriptive statistical results of the pre-test and post-test of the experimental group, as shown in Table 3.

Table 3 :Pre-test and post-test situation of students' oral language abilities in the experimental group under the support of AI-powered mobile devices (N=168)

Dimension	Pre-test mean	Pre-test standard deviation	Post-test mean	Post-test standard deviation
Fluency	49.08	12.11	79.08	8.47
Accuracy	50.80	11.99	79.30	10.01
Pronunciation	46.21	12.17	78.64	8.17
Conversation	40.31	10.92	77.62	8.42

It can be seen that the average scores of all four dimensions have achieved a significant increase of nearly 30 points, and the average scores of the post-test are generally close to or exceed 79 points, indicating that students have made substantial progress in aspects such as pronunciation, language accuracy, and fluent expression. From the perspective of each dimension, the conversation score improved the most, indicating that situational tasks, group cooperation dialogues and role playing activities using mobile devices were most conducive to cultivating students' cohesion and communication skills.

3.3 Analysis of the Impact of AI-powered Mobile Device Usage Behavior on Learning Engagement

In order to deeply understand the influence of AI-assisted learning function on students' mobile learning, this paper extracts and analyzes relevant statistical data from learning system logs and student questionnaires, and discusses the relationship between students' learning behavior, learning effectiveness and their oral performance. The platform automatically records each student's login frequency during the intervention period, the completion rate of pre-class preview tasks, the total duration of post-class oral practice, and the completion rate of immediate classroom tasks; the questionnaire depicts students' learning engagement from aspects such as attention investment, emotional investment, interaction investment, and persistence, and calculates the improvement in oral language scores based on the difference in pre-test and post-test scores.

Descriptive statistics show that within 16 weeks, the average login frequency of students in the experimental group was close to 60 times, and approximately two-thirds of the students could maintain a relatively high pre-class preview completion rate. The difference in the total duration of post-class oral practice was significant, and the practice time of a few frequent users

was much higher than the average level within the group. Generally speaking, those who logged more frequently, had a higher pre-class preview completion rate, and spent more time on post-class oral practice had higher scores on the learning engagement scale and greater improvement in oral language scores, presenting a trend of "high usage - high engagement - high improvement".

Based on this, Pearson correlation analysis was used to test the connection between each behavior indicator and learning outcomes, and the results are shown in Table 4. The number of platform logins was moderately positively correlated with the learning participation score ($r = 0.46$, $p < 0.01$), and there was also a significant positive correlation with the total improvement value of oral language ($r = 0.39$, $p < 0.01$). The correlation coefficient between the pre-class preview completion rate and the oral language improvement value was 0.42 ($p < 0.01$), indicating that with the assistance of AI feedback and voice diagnosis, persistently completing the preview tasks over the long term is beneficial for laying a foundation for oral language expression in the classroom. The correlation coefficient between the total duration of post-class oral language practice and the total improvement value of oral language was the highest ($r = 0.51$, $p < 0.001$), suggesting that repeated practice and self-correction through mobile terminals are important steps for students' significant improvement in oral language ability. The correlation coefficient between the classroom immediate task completion rate and the learning participation score was 0.56 ($p < 0.001$), which also indirectly confirmed that in the blended classroom, immediate tasks organized through mobile devices can effectively motivate students' classroom engagement. Based on these results, it can be concluded that AI empowerment of mobile devices is not merely an additional channel for accessing learning resources, but rather through facilitating frequent, continuous, and traceable learning behaviors, it enhances students' participation and quality of engagement in oral language courses, laying a process-level foundation for subsequent improvement in oral language ability.

Table 4: Correlation Analysis of AI Empowered Mobile Device Usage Behaviors with Learning Participation and Oral Language Improvement Scores

Independent Variable (Platform Behavior Indicators)	Dependent Variable	Correlation Coefficient r	p Value
Platform Login Frequency	Learning Participation Score	0.46	<0.01
Platform Login Frequency	Oral Language Total Score Improvement Value	0.39	<0.01
Pre-Class Preview Task Completion Rate	Oral Language Total Score Improvement Value	0.42	<0.01
Total Duration of Post-Class Oral Language Practice	Oral Language Total Score Improvement Value	0.51	<0.001
Classroom Immediate Task Completion Rate	Learning Participation Score	0.56	<0.001

3.4 Qualitative Themes of Changes in Teachers' Hybrid Teaching Behaviors in the Context of AI-Powered Mobile Devices

From the interview records and classroom observation, it can be seen that after the intervention of AI-powered mobile devices, several significant changes occurred in teachers' hybrid teaching methods. The first is that the preparation thinking shifted from "following the textbook chapters" to "linking tasks based on information data". Many teachers mentioned in the interviews that previously, their preparation was mainly centered around textbooks and lesson plans, but now they would first check the learning profiles and common errors generated by the

platform, and then adjust the classroom introduction context, the difficulty gradient of oral tasks, and the group division, making the classroom arrangement more in line with students' current level and specific needs.

The second is that the classroom interaction and evaluation methods shifted from "concentrated feedback" to "immediate feedback and individual guidance". Teachers generally reported that the AI oral scoring and error clustering functions enabled them to quickly identify problem points in the classroom, using the limited time for targeted feedback instead of merely correcting sentence by sentence; some teachers also attempted to set "data feedback time" in the classroom to guide students to compare the score changes between their two recordings, promoting self-monitoring. The third is that the teacher's role shifted from a single knowledge transmitter to a organizer and collaborator of the learning process. Some teachers mentioned in the interviews that initially, frequent use of mobile devices brought certain technical anxiety, but as the operation became more proficient and positive effects became apparent, they were more willing to act as "learning partners" with students to jointly explore resources and interpret data, and this change in role identity laid the foundation for the subsequent continuous adoption of hybrid oral teaching models.

3.5 Qualitative Themes of Students' Learning Experiences and Perception of Oral Language Ability in the Context of AI-Powered Mobile Devices

The student interview records and reflection diaries show that in the blended oral language classes enabled by artificial intelligence and involving mobile devices, students' feelings about the class experience and their own oral language proficiency are mainly concentrated in several aspects. One frequently mentioned change is that "the sense of participation and presence has become stronger". Many students recalled that in previous oral language classes, they "didn't get the chance to speak", and they only managed to answer a few sentences after being called on by the teacher; now with the introduction of mobile devices, each class will have recording, group conversations or situational tasks, "everyone has to speak", and whether they have completed the task and how much they have spoken will all be recorded on the platform, making them feel that their efforts have "been seen". In such classes, they no longer just sit and listen to the teacher; instead, they are always in an active participation state.

Another frequently discussed topic is related to "changes in oral confidence and anxiety". Some students believe that AI scoring is "more objective" than peer evaluations and there is no need to worry about losing face. They can practice repeatedly on their phones, and only submit when they feel it is adequate. Some students reflected that they would use complex sentence patterns to answer in learning; Some students also admitted that they were initially stressed when receiving low scores and detailed wrong questions from the system. But as the scores gradually increased, from "around 60 to 80", the previous nervousness gradually turned into a sense of achievement, and their confidence in speaking good English also significantly increased.

The third theme is "activation of autonomous learning but also facing time and technical burdens". Most students recognized that mobile devices enabled oral practice "anytime and anywhere", making fragmented time available, and some previously silent students would repeatedly record and compare scores after class; at the same time, some students mentioned unstable network environments, limited device performance, and the use of the platform for multiple courses, which easily led to "task accumulation" pressure, requiring teachers to coordinate the rhythm and difficulty of tasks. Overall, students generally felt that their oral expression was "more daring" and "more fluent", and their subjective evaluation of oral language ability and quantitative scores improved significantly.

4 Discussion

4.1 Comprehensive Interpretation and Theoretical Explanation of the Impact of Teachers' Behaviors and the Role of Oral Language Ability

By combining quantitative and qualitative results, it can be seen that AI-powered mobile devices first indirectly affect students' oral language ability development by reconfiguring teachers' hybrid teaching behaviors. On the one hand, under the BOPPPS-PADD framework, teachers utilize platform data to design task chains and conduct hierarchical grouping. The classroom shifts from being centered around textbook chapters to being centered around learning tasks and communicative scenarios, significantly increasing the frequency and duration of students' real oral output. On the other hand, AI voice diagnosis and platform learning reports provide teachers with visual evidence, enabling them to implement immediate feedback during the class and conduct individualized guidance after class, forming a multi-round cyclical formative evaluation mechanism.

From a theoretical perspective, this process embodies the constructivist emphasis on "constructing meaning through social interaction in real tasks", which also aligns with the basic assumption of mobile-assisted language learning regarding "ubiquitous practice - timely feedback - data-driven regulation". The change in teacher behavior essentially involves a reconfiguration of teaching power and information flow: some control is transferred to learners and intelligent systems, and teachers more play the roles of learning facilitators and learning analysts. This role transformation and behavioral pattern reorganization provide structural support for the overall improvement of students' oral fluency, accuracy, pronunciation, and conversation skills.

4.2 Insights for Hybrid Oral Language Teaching Models and Teacher Teaching Behaviors

The research results indicate that artificial intelligence empowering mobile devices is not simply adding a technical tool on top of the existing classroom structure, but rather promoting the hybrid oral language teaching model to shift from "resource-driven" to "data-driven" and "task-driven". Under the BOPPPS-PADD framework, if teachers can regard the learning profiles, error distribution, and usage behaviors collected by the platform as the design starting point instead of an "add-on reference" after the fact, they can restructure the goals, content, and activity organization based on students' real needs. The introduction and target stages are no longer just a simple recitation of the teaching syllabus, but respond to the common problems identified in pre-tests and previewing; the participatory learning and dialogue stages no longer rely on random questioning, but provide achievable oral output paths for students of different levels through hierarchical tasks, role-playing, and group collaboration. The resulting hybrid teaching model emphasizes a closed loop of pre-class diagnosis, in-class practice, and post-class consolidation, and artificial intelligence and mobile terminals run through every node of this closed loop.

From the perspective of teacher teaching behaviors, the study suggests that universities should encourage teachers to view mobile devices as "part of the classroom organization and evaluation" rather than just a display medium. During the teaching preparation stage, teachers should learn to understand the data provided by the platform, organize scattered learning records, usage durations, and task completion situations into meaningful information, which can be used to adjust teaching goals and task designs, making subsequent classroom activities more targeted. In the teaching preparation stage, teachers need to learn to interpret the data analysis in the online learning system and convert it into educational suggestions. In the

specific classroom teaching activities, teachers are good at forming the "secondary processing" relationship between AI feedback data and student behavior, so as to transform digital scores and error types of questions into understandable teaching instructions, displays and peer reviews. In the course extension link, students should be guided to complete self-reflection work with the help of mobile phones and other mobile terminals, not only the number of tasks completed. At the same time, schools should also provide policy support from the aspects of work volume, teaching research and collective lesson preparation to help teachers form stable educational beliefs and behavior patterns in addition to technology, and effectively integrate artificial intelligence technology into the blended oral teaching system with the help of intelligent tools.

4.3 Insights for English Oral Language Teaching Practice and Teaching Management in Universities

At the practical level, the results suggest that the teaching arrangement of English interpretation courses in colleges and universities needs to form a fixed relationship between "classroom-online space-scene". Finally, in the design of oral activities, teachers can expand the one-time oral activities originally completed in class into a trinity learning process of "extracurricular preparation - classroom implementation - after-class consolidation" with the help of AI's ability to score and push materials on mobile terminals in real time, and refine the task granularity and increase the frequency. Replacing temporary big tasks with high-frequency small tasks such as recording, reading, and dialogue exercises will not bring psychological pressure to students, and it is easy for AI to monitor students' learning progress. For students with poor foundation or weak self-control, more explicit task reminders and stage goals can be set, and they can be guided to experience "complete a task - get an evaluation - find a little progress" on the platform, so as to gradually cultivate their oral expression confidence.

At the same time, from the perspective of teaching and management, whether the AI-powered mobile terminal can really play a role depends on the policy support and resource investment of the school. When curriculum or teaching reform projects are proposed and implemented, the deep integration of mobile learning platforms with university oral English courses should be treated as part of the overall plan, rather than an add-on. It is advisable to adopt a small number of relatively stable platforms with reasonably complete functions at the institutional level, and to provide technical support and routine maintenance for them. This can reduce the time and effort teachers lose when they have to move back and forth between different platforms and tools. The teaching management department, when determining teaching workload and organizing teaching evaluations, should appropriately increase the weight of process data and formative evaluations, and consider the investment made by teachers in task design, process feedback, and individual guidance as teaching labor, and incorporate it into the assessment and incentive mechanism. At the same time, schools can make use of in-house training, teaching-research workshops and open-class observations to provide channels for teachers to exchange experiences and share task resources. Over time, this can help build shared goals and a community of practice around AI-supported mobile speaking instruction within the institution, so that technological tools become a sustained force for curriculum development and for improving the quality of teaching, rather than a short-lived add-on.

4.4 Research Limitations and Future Research Directions

This study was carried out with business undergraduates from several universities in western China, and the teaching intervention took place in one semester-long oral English course.

However, the study is still limited by school type, major type, and grade level, so caution should be exercised before generalizing to other regions, older students, or non-English majors. Due to the influence of teaching arrangement and school administration, the study adopted unequal groups of pre-test and post-test experimental design, which could not be completely randomized, and eliminated external interference variables. The improvement of students' oral proficiency may have a certain impact on other courses and personal growth, so it is necessary to further eliminate possible confounding factors through more elaborate experimental design.

In the process of data collection, questionnaires, self-stated interviews and platform logs were mainly used. Although the reliability of the conclusions is improved through multi-source information and method triangulation mutual proof, there is still more need for refinement in areas such as automatic evaluation algorithms for verbal expressions and actual behavioral indicators of learning engagement. Although multiple sources of data and methods are triangulated to enhance the credibility of the conclusion, there is still room for further refinement in the automatic evaluation algorithm for oral performance and objective behavioral indicators of learning participation. Future research can consider introducing a comparative design with multiple platforms and tools, summarizing common mechanisms from different technological forms of artificial intelligence systems; it can also extend the tracking period, extending the one-semester intervention to cross-year tracking to observe the long-term stability of students' oral ability and learning behavior changes; at the same time, adding more teacher samples and collaborative research with different institutions can help to better understand the applicable boundaries and optimization paths of artificial intelligence empowerment of mobile devices in college English oral teaching from a more macro perspective.

5 Conclusion

Based on the empowerment of artificial intelligence to mobile devices for the mixed teaching behavior of English teachers and its role in enhancing students' oral language skills, this paper has constructed a university-level mixed teaching plan for oral English that covers pre-class preview, in-class interaction, and post-class expansion. It has conducted a systematic examination from three aspects: teacher behavior, learning process, and learning outcome. The research shows that under the joint effect of the BOPPPS-PADD framework and the intelligent mobile learning platform, teachers gradually form a mixed teaching behavior model centered on task chains, based on data feedback, and with formative evaluation as the main focus. The classroom roles shift from knowledge instructors to learning facilitators and learning analysts. The teaching organization places greater emphasis on contextualized oral tasks and group collaboration, and the feedback mechanism becomes more timely and individualized.

At the student level, artificial intelligence empowering mobile devices significantly increases the opportunities for oral language output, strengthens the efforts in pre-class preparation and post-class consolidation, and also to some extent boosts the learning participation and self-efficacy. Quantitative results show that the differences in the pre-test and post-test scores of the experimental group students in terms of the total score of oral language and each sub-dimension such as fluency, accuracy, pronunciation, and conversation are all at the statistically significant level. There is a moderate positive correlation between the platform usage behavior indicators and the improvement in oral language scores. The "high usage - high participation - high improvement" process chain has been largely confirmed in the sample. Overall, artificial intelligence empowerment of mobile devices not only provides relatively solid technical support for the optimization of the mixed teaching model of college oral English, but also proposes new directions for university curriculum construction, teaching management,

and teacher professional development. If it can be continuously tracked in a larger sample, more disciplines, and a longer time span in the future, it is expected to further enrich the relevant theoretical discussions and provide more abundant and reliable evidence for practical promotion.

Funding

This work was supported by Institutional Research Project of Xi'an Eurasia University (Grant Number S2025002). This research was also funded by Research Project under the National Business Education Research Plan" (Grant Number SKJYKT-2505209)

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