

Mobile Learning Technology-Assisted English Speaking Teaching in the Digital Context

XIAOJING HUANG^{1,2,*}, YANYAN WU¹

¹Hainan Vocational University of Science and Technology,
Haikou 571126,
CHINA

²Taylor's University,
Subang Jaya 47500,
MALAYSIA

Abstract: - In the digital era, the prevalence of mobile devices has spurred the extensive application of mobile learning technology. This study delves into its role in oral English teaching. By surveying 1000 students and 300 teachers from diverse backgrounds, it analyzes their use of mobile learning. Students commonly use smartphones for learning, with vocabulary apps being popular. Learning is impacted by interaction and resource quality. Teachers encounter difficulties while using apps for homework. The study develops a teaching model that takes into account a number of variables and uses trials to confirm its efficacy. It suggests methods for assisting students, instructors, and technology. In the digital age, this study provides ideas for improving oral English instruction using mobile learning.

Key-Words: - Digitalization, digital era, Mobile Learning Technology, Teaching Spoken English, Digital Context.

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1 Introduction

The oral education of English is a major problem in education and suffers from two major constraints in traditional classrooms: students practice speech, and there is no genuine linguistic context, [1]. These problems hinder the development of practical skills and unhindered communication, as students rarely engage in a permanent dialogue in the real world or receive timely answers to their speech, [2], [3].

The spread of mobile devices – more than 90% of urban students own a smartphone or tablet – represents a promising solution to these gaps. Its innate flexibility (the ability to learn anytime, anywhere) and interactive features (such as language recognition and virtual scenarios) directly take into account the time and contextual constraints of traditional oral teaching. However, existing studies on learning English by phone have serious drawbacks: most studies are based on a limited sample (e.g., a study). School or regional groups. Rather than different population groups, a few of them establish clear links between mobile learning (e.g., application use patterns) and measurable conditional skills, [4], [5]. The theoretical framework in this area often remains separate from

the specific requirements for the acquisition of Oral English. Their practical value is limited.

2 Rationale and Technical Support

2.1 Constructivist Learning Theory

Constructivism assumes that Learning is an active process of knowledge acquisition and not passive absorption, particularly in education, Oral English. Where students must actively develop their conversation skills, and not just follow the rules. For example, students use mobile platforms for discussions or role-playing to generate expressions based on constructive principles.

However, the existing constructive applications in oral English education are largely limited to hourly activities (such as group discussions). Take advantage of interaction anytime, anywhere, for mobile devices. This gap aggravates an important problem for Oral acquisition: the limited possibilities of practice in the real world. To address this, this study integrates VR/AR into a constructive framework and creates immersive scenarios (e.g., simulation lectures and daily English language) that allow authentic speech to be practiced outside the

classroom - directly filling gaps in the context of traditional and constructive learning, [6].

2.2 Mobile Learning Theory

The theory of mobile learning focuses on using the unique capabilities of mobile devices - flexibility, interaction, and adaptation - to facilitate learning and to consider these properties directly as major problems in oral English acquisition, [7], [8].

Its "jederzeit und überall" flexibility addresses the problem of limited practice opportunities in ordinary classrooms: students can work part-time (e.g., while on the move), using them to practice pronunciation using mobile apps with speech recognition. Provides instant answers to pronunciation or expression - filling a missing gap in real-time orientation in self-directed oral practice. At the same time, the emphasis of the theory is focused on adapting to the different needs of students: mobile systems analyze data on student performance (e.g., errors in repetitive language rules and stress reduction) to create tailored workouts. As a targeted dialogue for improving stem exercises or correcting errors in grammar weaknesses, [8].

In particular, [9], [10] noted a crucial gap in the mobile learning theory that exists in MALL: it does not sufficiently address fundamental "interactivity". Oral English, where most research focuses on the use of individual applications rather than joint communications. To mitigate this, this study integrates real-time mobile interactions (e.g., video conversations between teachers and students and discussion groups between couples through mobile platforms). Within a framework that allows for a dynamic conversation that corresponds to the communicative nature of oral English.

2.3 Mobile Learning Technologies

The development of mobile learning supports many technologies that have greatly improved the effectiveness and flexibility of learning. Here are some of the most important methods of mobile learning:

Radio technology is the main technology that enables learning using a mobile phone. These include Wi-Fi technologies and mobile networks such as 4G and 5G. The Wi-Fi service ensures a fast and stable network connection in fixed locations such as schools, homes, and cafes, allowing students to access a large amount of educational resources, watch high-definition videos, and participate in online discussions. For example, in Wi-Fi classrooms, students can use their mobile devices to download teaching materials and perform tasks in

real time. Mobile networks, in turn, provide broad coverage and high mobility, so students have access to educational platforms and resources anywhere, anytime. Whether in the park, by bus, or on the road, students can continue their studies via their mobile devices using mobile networks. This technology destroys the boundaries of time and place in the world. Traditional education makes teaching more flexible and appropriate. It's a good result.

Mobile applications: Mobile applications are the main support for Mobile learning. There is a wide range of educational applications on the market covering various areas such as language learning, vocational training, and exam preparation. For language study, some applications offer features such as lexicon study, oral exercises, and language explanations. Students can use these applications to practice pronunciation, chat with virtual teachers, and perform pronunciation exercises. Listening and reading. In the field of professional education, some applications offer step-by-step courses, case studies, and practical exercises for various professions that help students hone their professional skills. These applications are designed to be user-friendly and interactive, so that students can learn through games, tests, and quizzes. Other forms, to reinforce the learning and its effectiveness. It's a good result.

Augmented reality (AR) and virtual reality (VR): Augmented reality and virtual reality technologies offer an exciting educational experience for learning via mobile phones. AR technology brings virtual information into the real world so that students can gain a more intuitive and vivid understanding of the teaching content. For example, students of the history course can use the AR application to observe the restoration of historical places and personalities in a real environment, and the learning process becomes more interesting and unforgettable. Virtual reality technology creates a virtual learning environment that allows students to feel as if they are in a real landscape. In medical education, students can use virtual reality to simulate surgical operations and anatomical research. Improve their practical skills and understand medical knowledge. These methods not only promote interaction and participation in teaching but also help students better understand and master complex knowledge and skills.

3 Survey on the Current Situation of Mobile Learning Technology-Assisted English Speaking Teaching

3.1 Survey Design and Implementation

3.1.1 Survey Population and Sample Characteristics

The purpose of the survey was to thoroughly evaluate how mobile learning technology is used in oral English instruction. Students and English teachers from a variety of backgrounds made up the target group. The following Table 1 presents the detailed characteristics of the surveyed sample:

Table 1. Detailed Characteristics of the Surveyed Sample

Group	Sample Size	Age Range	Educational Level	Geographic Region	School Type
Students	1000	10-22 Years Old	Primary (Grade 5-6),	Metropolitan (30%), Suburban (30%), Rural (40%)	Public (70%), Private (30%)
			Secondary (Grade 7-12), Tertiary (Freshmen-Seniors)		
English Teachers	300	25-55 Years Old	Bachelor's Degree (60%), Master's Degree (30%), Doctoral Degree (10%)	Metropolitan (40%), Suburban (30%), Rural (30%)	Public (80%), Private (20%)

Source: created by the authors

For students, the age range was selected to cover different developmental stages of language learning. The breakdown by educational level and geographic region aimed to capture potential variations in access to and usage of mobile learning technologies. The inclusion of both public and private school students provided a more comprehensive view of the educational landscape.

Among the English teachers, the age distribution was considered to understand how different generations of educators approach mobile learning. The variation in educational attainment and school types was also factored in to assess the influence of these factors on the adoption and integration of mobile learning in teaching.

3.1.2 Survey Instrument and Methodology

Let T denote the daily usage time of mobile devices for non-entertainment purposes (in hours), and let represent the student type (for primary students, for secondary and tertiary students). Then, a simple model to represent the relationship between them can be established as:

$$T = \begin{cases} 1, & S = S_1 \\ 1.5, & S = S_2 \end{cases} \quad (1)$$

Let L be the length of time students have owned mobile devices (in months). Assuming there is a linear relationship between the ownership length and the usage frequency F , a model can be formulated as $F = aL + b$ follows: Through further data collection, the coefficients can be determined to analyze the impact of ownership length on usage frequency.

Students were required to list the mobile learning applications they had used for oral English learning in the past six months. They were also asked to rate the frequency of use (Never, Rarely, Sometimes, Often, Always) and the perceived usefulness of each application on a 5-point scale. Popular applications such as (Fun Dubbing in English), (Baicizhan), and various English learning podcasts were included in the list.

Let U be the perceived usefulness rating of the application (1-5points), and F be the usage frequency (1-5points, corresponding to Never, Rarely, Sometimes, Often, Always, respectively). A simple, comprehensive evaluation model $E = U * F$ can be constructed to measure the comprehensive effect of the application on students' oral English learning. The higher the E value, the better the comprehensive role of the application in learning.

Let A represent the type of application (A_1 for vocabulary applications, A_2 for oral training applications, etc.), and let be the weight of the impact of different types of applications on the learning effect (w_1 corresponding to the weight of A_1 type applications, corresponding to the weight of type applications, etc.). Then the learning effect improvement value G can be expressed as $G = \sum_i w_i E_i$. Through the analysis of the weights and comprehensive evaluations of different types of applications, application programs can be recommended more targeted.

3.2 Analysis of Student Usage Survey Results

3.2.1 Frequency of Mobile Learning Device and Application Use

The following Table 2 and Table 3 illustrate the comprehensive data regarding students' possession and utilization of mobile learning devices and applications:

Table 2. Students' Possession and Daily Usage of Mobile Learning Devices

Mobile Learning Device	Ownership Proportion	Mean Daily Usage Time (in Minutes)
Smartphone	90%	120
Tablet	40%	55
Laptop	28%	40
Smartwatch (for Educational Activities)	15%	18

Source: created by the authors

Table 3. Mobile Learning Application Usage by Students in Oral English Learning

Mobile Learning Application Genre	Usage Frequency Per Week	Mean Duration Per Usage Session (in Minutes)	Percentage of Frequent Users (≥ 3 Times/Week)
Vocabulary Enhancement Apps (e.g., "Vocabulary Builder Pro")	4.0	20	62%
Oral Proficiency Training Apps (e.g., "Speak English Fluently")	3.3	25	55%
Online Educational Course Platforms (e.g., "EdX-English Language Courses")	2.5	35	42%
Educational Games for English Acquisition	2.0	28	35%
English Audio and Podcast Apps	3.0	23	50%

Source: created by the authors

Smartphones are the most prevalent mobile learning device among students, with 90% ownership and an average daily usage time of 120 minutes. Tablets follow with 40% ownership and 55 minutes of daily use, while laptops and smartwatches have relatively lower adoption rates.

Among applications, vocabulary enhancement apps lead in usage frequency, with 4.0 times per week and 62% of students using them regularly. Oral proficiency training apps are also popular, used 3.3 times weekly. Online course platforms are used 2.5 times a week, and educational games and English audio/podcast apps have their own user bases.

The high usage of smartphones is likely due to their convenience and versatility. Vocabulary apps' popularity may stem from the need for quick and repetitive learning. The differences in application usage suggest that students have diverse learning preferences and needs. Educators can leverage this data to better integrate mobile learning into oral English teaching, perhaps by recommending specific apps based on learning goals or using smartphone features more effectively in class activities.

3.2.2 Influences on Oral Language Learning

Table 4. Factors Affecting Students' Oral English Learning and Their Perceived Impact Levels

Factor	Percentage of Students Mentioning	Perceived Impact Level (1-5, 5 Being Highest)
Quality of Learning Resources	85%	4.2
Interaction Opportunities	78%	3.8
Motivation and Interest	80%	3.5
Personalized Learning Experience	70%	3.6
Technical Support and Usability	65%	3.2
Parental and Peer Support	55%	2.8

Source: created by the authors

Interviews with students (Table 4) showed that the quality of educational resources was of great concern. Students enjoy mobile apps and online platforms that offer accurate pronunciation patterns, explanations in a rich dictionary, and varied conversation topics. For example, many students

have appreciated applications that offer real-life conversation scenarios and in a cultural context that they feel have significantly improved their speaking skills.

The decisive role played and the possibilities for interaction. Students with access to features such as online discussion forums, group projects, or live discussions with teachers reported increased confidence and speedy conversation. They stressed the importance of being able to communicate with their counterparts and get immediate answers. Motivation and motivation interest are closely related to the design and content of the educational material. Interactive educational apps and games tend to keep students more interested and passionate about language exercises. However, some students indicated that technical problems such as slow load times or speech recognition errors could sometimes slow them down.

3.3 Analysis of the Results of the Survey on Teachers' Application

Framework of English Oral Teaching Ideas as shown in Figure 1. The comprehensive information about instructors' use of mobile learning technology in spoken English instruction is displayed in Table 5.

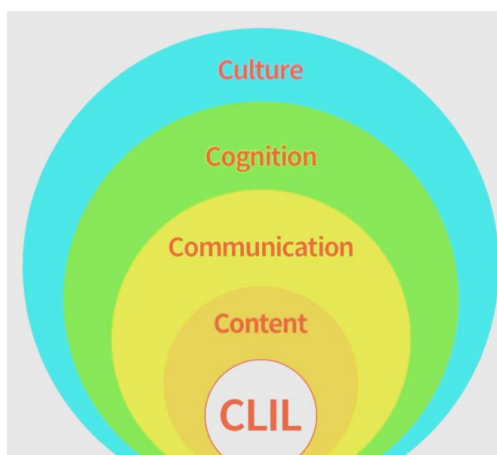


Fig. 1: Framework of English Oral Teaching Ideas
Source: created by the authors

The information in the table provides insightful information about how teachers use mobile learning tools to teach oral English. With an average of 4.2 times each month, a noteworthy 65% of teachers use mobile apps to distribute homework. This suggests that the ease and adaptability that these apps can offer in expanding learning outside of the classroom is becoming increasingly acknowledged. Even though this application feature is frequently used, there is still an opportunity to make the homework

assignments more dynamic and engaging, as indicated by the student engagement level of 3.5.

Table 5. Teachers' Application Frequency and Student Engagement of Mobile Learning Technology in Oral English Teaching

Application Aspect	Percentage of Teachers	Average Frequency Per Month	Student Engagement Level (1-5, 5 Being Highest)
Using Mobile Apps for Homework Assignment	65%	4.2 Times	3.5
Incorporating Online Learning Platforms in Lessons	50%	3.0 Times	3.8
Utilizing Educational Social Media Groups	40%	5.5 Times	3.2
Employing Mobile Tools for Classroom Interaction	55%	3.8 Times	3.6
Creating Self-made Mobile Learning Resources	30%	1.5 Times	4.0

Source: created by the authors

Regarding the incorporation of online learning platforms in lessons, only 50% of teachers do so, at an average of 3.0 times per month. The relatively lower frequency might imply that some teachers face barriers such as technical difficulties or concerns about integrating these platforms smoothly into their existing teaching methods. Nevertheless, the student engagement level of 3.8 shows that when used, it can have a positive impact on students' interest and participation. 40% of teachers who utilize educational social media groups do so with a relatively high frequency of 5.5 times per month. This could be due to the ease of communication and sharing of resources within these groups, [11], [12]. Yet, the student engagement level of 3.2 indicates that the effectiveness in directly enhancing oral English learning might be somewhat limited.

In terms of employing mobile tools for classroom interaction, 55% of teachers engage in this practice, with an average frequency of 3.8 times per month, [13]. This shows that a considerable portion of teachers are leveraging mobile technology to make their classes more dynamic. The

corresponding student engagement level of 3.6 reflects the positive, but not outstanding, effect on student involvement. Finally, only 30% of teachers create self-made mobile learning resources, and they do it an average of 1.5 times per month. This low percentage and frequency might be attributed to the time and technical skills required for resource creation, [13], [14], [15].

Table 6. Multiple Linear Regression Results for Oral Proficiency Improvement

Variable	Coefficient	Std. Error	t-value	p-value	VI F
Intercept	1.23	0.15	8.20	<0.001	–
X1: Device usage time	0.004	0.001	3.85	<0.001	1.32
X2: Vocabulary app frequency	0.05	0.03	1.67	0.096	1.45
X3: Oral training app frequency	0.21	0.04	5.25	<0.001	1.28

Source: created by the authors

It can be known from Table 6 that Oral training apps (X3) were the strongest predictor: each additional weekly use increased self-reported proficiency gain by 0.21 points. Specifically, students using oral training apps ≥ 3 times/week (55% of the sample) reported a 27% higher proficiency gain than those using them <3 Times/week (mean gain: 3.8 vs. 3.0 points).

Device usage time (X1) had a weak but significant effect: gains increased slightly with longer use, but marginal benefits diminished when daily use exceeded 120 minutes (consistent with Table 2's mean usage time).

Vocabulary apps (X2) showed no significant predictive power ($p=0.096$), despite their high usage frequency (Table 3). This aligns with student feedback that vocabulary apps lack interactive speaking practice—limiting their ability to drive oral proficiency gains.

4 Conclusion

In conclusion, this study has systematically explored the application of mobile learning technology in oral English teaching in the digital context. Through theoretical analysis and empirical research, it has been found that mobile learning technology,

supported by various advanced technologies, has the potential to enhance the teaching effect of oral English. However, both students and teachers face certain challenges in the process of using it.

For students, while they show a high degree of acceptance and utilization of mobile learning devices and applications, issues such as the quality of learning resources and technical support need to be further improved. Teachers, on the other hand, have gradually recognized the value of mobile learning technology in teaching, but there is still a need to enhance their application ability and overcome obstacles such as integration difficulties.

Declaration of Generative AI and AI-assisted Technologies in the Writing Process

The authors wrote, reviewed and edited the content as needed and verifies that none utilized artificial intelligence (AI) tools were used. The authors take full responsibility for the content of the publication.

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Xiaojing Huang and Yanyan Wu wrote and revised the manuscript. Xiaojing Huang carried out the methodology and resources.

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The authors have no conflicts of interest to declare that are relevant to the content of this article.

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