

The Design and Application of English Reading APP Incorporating Interactive Learning Theory

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Received: 6 November 2024; **Accepted:** 30 November 2024; **Published:** 17 December 2024

Abstract:

With the rapid development of information technology, mobile learning has become an important branch in the field of education. This paper aims to discuss how to apply interactive learning theory to the design and teaching practice of English reading APP to improve college students' English reading ability. The paper begins by describing the core concepts of interactive learning theory, including active student participation, timely feedback, and collaboration among learners. A framework for designing an English reading APP based on this theory is then proposed, which emphasizes the intuitiveness of the user interface, the interactivity of the content, and the adaptability of the personalized learning path. In the section on teaching applications, this paper proposes a series of innovative teaching methods, such as flipped classroom, peer assessment and gamified learning, which are made possible by the English reading app, thus stimulating students' interest and increasing their engagement.

Keywords:

Interactive Learning Theory, English Reading App, Mobile Learning, College English Teaching, Teaching Application

1. Introduction

In today's globalization, English, as the main language of international communication, has become increasingly important for its reading ability [1]. Colleges and universities, the cradle of cultivating high-quality talents, directly affects the international competitiveness of students for their quality of English reading teaching. However, the traditional English reading teaching mode is often limited by time and space, making it difficult to meet students' individualized and flexible learning needs [2]. With the rapid development of mobile Internet technology, mobile APP, as an emerging educational tool, provides new possibilities for English reading teaching. Based on interactive learning theory, this paper discusses the application of English reading APP in English teaching in colleges and universities in English teaching in colleges and universities. Interactive learning theory emphasizes the interaction among learners and between learners and learning materials, which is

important for improving motivation and learning outcomes. This study aims to explore the potential of an English reading APP in enhancing the English reading ability of college students by designing an English reading APP that incorporates interactive learning theories.

The paper first analyzes the challenges and needs of English reading teaching in colleges and universities, then introduces in detail the design concept and functional modules of the APP based on the interactive learning theory, evaluates the application effect of the APP in actual teaching, and discusses its impact on the improvement of students' English reading ability. Finally, this paper puts forward suggestions for improving the existing English reading teaching mode, which provides new ideas and methods for English teaching in colleges and universities.

2. Bibliography

Interactive Learning Theory (ILD) originated in the fields of educational psychology and computer-assisted instruction, and its core elements include learner initiative, collaborative learning, feedback mechanisms, and the integrated use of technology [3]. Dillenbourg (1999) proposed that collaborative learning is a key component of interactive learning theory, emphasizing that interaction between learners could facilitate the co-construction of knowledge. In addition, Jonassen (2003) argued that learner initiative was the basis for achieving effective learning [4], and that learners should be actively involved in the learning process to construct knowledge through exploration and practice. Feedback mechanisms provides learners with the opportunity to understand their learning status, helping to adjust learning strategies in a timely manner. Technology integration use refers to the seamless integration of educational technology into the instructional process to support and enhance the learning experience.

3. Design Principles

Aiming to provide a comprehensive English reading learning platform for college students, English reading APP enhances the learning experience by integrating core elements of interactive learning theory, such as active student participation, timely feedback, and collaboration among learners. The design of the APP takes into account the intuitiveness of the user interface, the interactivity of the content, and the adaptability of the personalized learning paths to meet the needs of different learners [5].

User-centered design: emphasize the design and development of APP with the needs and experience of learners as the core. This principle requires developers to have an in-depth understanding of the target user's learning habits, preferences and ability level to ensure that the APP interface is user-friendly, easy to operate and able to meet the user's personalized learning needs.

Personalized learning path: Provide customized learning content and activities based on learners' abilities, interests and learning objectives. The implementation of this principle usually relies on advanced algorithms and data analytics to track learners' progress and performance and adjust the difficulty and depth of learning content accordingly [6].

Interactivity and feedback mechanism: Ensure that learners can effectively interact with the APP during the reading process and get timely feedback on their

reading performance. Such mechanisms include not only the traditional correct and incorrect instructions, but also deeper explanations and guidance to help learners understand the causes of errors and provide directions for improvement.

Diversity and adaptability of content: The APP is required to provide rich and diverse reading materials to meet the needs of learners with different backgrounds and interests. These materials should cover a variety of topics, genres, and difficulty levels to accommodate the learning paths of different learners. At the same time, the APP should be able to dynamically adjust content recommendations based on learners' reading performance and feedback to ensure that the learning material is relevant and challenging.

4. Functional Modules of the English Reading APP

The English Reading APP does not only support individual learning, but also encourages social interaction and peer evaluation. Their functional modules constitute an interactive and user-friendly learning environment. They do not only support individual learning, but also encourage social interaction and peer evaluation, thus facilitating co-construction of knowledge and in-depth understanding. The functional modules of APP include:

4.1. Reading material library and personalized recommendation system

English reading APP should have a rich and diverse library of reading materials, including news, novels, essays, scientific and technological articles and other types of content. The material library should be categorized according to the different needs and interests of users, such as by difficulty, theme, genre, etc., so as to facilitate users to quickly find reading materials suitable for them. Using big data and artificial intelligence technology, the APP can personalize and recommend suitable reading materials based on the user's reading history, interests and learning progress [7].

4.2. Interactive reading tools and activities

In order to enhance the user's reading experience, the APP should provide a variety of interactive reading tools, such as clicking on words to view translation, voice reading, note marking, vocabulary review and other functions. Users can click on words they do not recognize during reading to see explanations and add them to the vocabulary book for review. The voice reading function can help users to correct their pronunciation and improve their listening and speaking skills [8]. In addition, the APP can be designed with a variety of interactive reading activities, such as reading comprehension quizzes, discussion forums, and reading challenges, to test user comprehension and promote learning.

4.3. Peer evaluation and social learning functions

The APP should provide peer evaluation functions so that users can rate and comment on the reading materials and share their reading experience and insights. By checking the ratings and comments of other users, users can better choose reading materials that suit their needs [9]. In addition, APP can introduce social learning functions, such as adding friends, forming study groups, attending reading, sharing learning progress, ranking reading, etc., to enhance the interactivity and fun of learning.

4.4. Gamified learning elements

To increase the fun of learning and user stickiness, the APP can introduce gamified learning elements, such as gaining points by completing reading tasks, unlocking achievements, and participating in reading contests. Points can be used to redeem virtual rewards or actual rewards, the achievement system can record the user's learning milestones, and reading contests allow users to improve their reading skills in a relaxed and enjoyable atmosphere. In addition, some interactive games related to reading, such as word spelling games, reading comprehension breakthrough games, etc., can be designed in the APP to help users consolidate what they have learned and increase their interest in learning [10].

5. Development of English reading APP Incorporating Interactive Learning Theory

The development of the English APP is closely aligned with the latest advances in modern educational technology and aims to create a platform that provides both a personalized learning experience and enhances interaction between learners. During the development, we made key decisions, including platform selection, application of key technologies, and detailed planning of the implementation process.

5.1. Platform selection

When developing an English reading APP that incorporates interactive learning theories, the first decision we face is to choose a suitable development platform. Considering the need to publish the APP on Android and iOS, we decided to use Flutter as the development framework. Flutter is favored by developers for its high performance, cross-platform compatibility and rich UI components. Using the Dart language, Flutter allows us to write code once and run it on two platforms simultaneously, which greatly reduces development time and cost. Additionally, Flutter's hot reloading feature speeds up the development process, allowing us to quickly iterate and test new functions.

5.2. Key technologies

In the process of developing the “English Reading APP with Interactive Learning Theory”, we adopted several key technology areas to ensure the functionality, interactivity and user experience of the APP. These key technologies provide technical guarantees for APP development, as detailed in the table below:

Table 1. Description of the Key Technologies of English Reading App Incorporating Interactive Learning Theory.

Item	Key technologies	Implementation methods	Realize goals
User interface (UI)	Flutter	Build responsive layouts	Adaptive screen
Personalized recommendation system	Machine learning algorithms	Integrated into Firebase ML Kit	Provide customized content
Real-time feedback mechanisms	WebSocket	Realize real-time communication	Enhance learning interactivity
Social learning functions	Firebase	Enable user-to-user interaction	Build learning communities
Gamified learning elements	Points and achievement system	Design interactive games and challenges	Increase motivation to learn
Multi-language	Flutter's intl kit	Dynamic language switch	Support for

support			multilingual users
Performance optimization	Code splitting and lazy loading	Optimize resource loading and page rendering speed	Enhance the user experience
Data security	HTTPS and AES encryption	Encrypted data transfer and local storage	Maintain user privacy and data security

5.3. Realization process

In the process of developing “English Reading APP with Interactive Learning Theory”, we followed a systematic realization process to ensure the smooth progress and final realization of the project, as shown in the figure below.

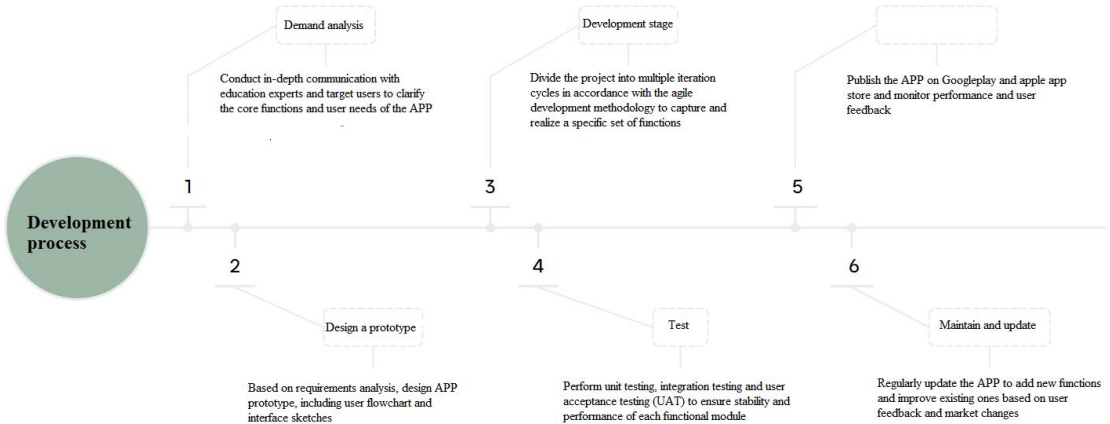


Figure 1. Flowchart of Development of English Reading APP Incorporating Interactive Learning Theory.

6. Application of English Reading APP Integrating Interactive Learning Theory

When discussing the application of English reading APP integrating interactive learning theory, we can state and summarize from multiple dimensions:

6.1. Technology Integration and Innovative Pedagogy

The application of English reading APP is not only limited to the traditional teaching environment, but can also be combined with the latest educational technology to create a new teaching mode. For example, through Augmented Reality (AR) and Virtual Reality (VR) technologies, the APP can provide an immersive reading experience that allows learners to interact with the text in a virtual environment to enhance memorization and comprehension. In addition, by integrating artificial intelligence technology, the APP can realize intelligent voice interaction and provide natural language processing capabilities, allowing learners to operate through voice commands, thus freeing up their hands and improving learning efficiency.

6.2. Learner autonomy and personalized learning

The English reading APP supports learner autonomy by allowing them to choose reading materials according to their interests and learning pace. Through the setting of personalized learning paths, learners can receive content recommendations that match their level, thus improving motivation and efficiency. In addition, the self-assessment tool and progress tracking function in the APP allow learners to monitor their own

learning progress, adjust their learning strategies in time, and realize self-regulated learning.

6.3. Socio-cultural context and cross-cultural communication

The application of English reading APP can also be extended to the cultivation of cross-cultural communication and global awareness. By providing reading materials from different cultural backgrounds, the APP helps learners understand global issues and multiculturalism and develop an international perspective. Meanwhile, the social learning function within the APP connects learners from all over the world, facilitating communication and cooperation among them and deepening their understanding of different cultures.

6.4. Lifelong Learning and Career Development

The application of English reading APP is not only limited to the academic environment, but can also be extended to the workplace and personal development. For professionals, the APP can provide industry-related English reading materials to help them maintain up-to-date industry knowledge and enhance their career competitiveness. For regular users, the APP can serve as a lifelong learning companion, providing continuous English learning resources to support their career development and personal interest exploration.

6.5. Educational equity and universal access

Through the English Reading APP, high-quality English learning resources can cross geographic and economic barriers and provide learning opportunities for a wider range of people. This will help narrow the gap in the distribution of educational resources and improve educational equity. Especially in remote areas, the APP can serve as a bridge to connect high-quality educational resources so that learners there can also enjoy the same learning experience as urban learners.

This paper comprehensively discusses the practice of interactive learning theory in the design and application of English reading APP, emphasizing the importance of mobile learning in modern education. By reviewing the core concepts of interactive learning theory, this paper proposes a user-centered APP design framework that highlights the importance of intuitive user interfaces, interactive content, and personalized learning paths. The functional modules of the English reading APP proposed in the paper, including a library of reading materials, a personalized recommendation system, interactive reading tools and activities, peer evaluation and social learning functions, and gamified learning elements, aim to create a comprehensive, personalized, and interactive learning environment.

In addition, this paper discusses the many possibilities of APPs in teaching applications that go beyond the traditional teaching-learning paradigm, covering multiple dimensions such as technology integration, learner autonomy, and socio-cultural context. These applications do not only enhance the English reading skills of students in higher education, but also promote intercultural communication, support lifelong learning, improve educational equity, and consider environmental adaptability and sustainability.

7. Conclusions

In general, the English reading APP integrating interactive learning theory provides new perspectives and tools for English teaching in colleges and universities, and its effectiveness in enhancing students' satisfaction, reading scores, and critical thinking skills has been verified through empirical studies. Future research and practice should continue to explore ways to optimize the design of APPs and how to integrate these tools more effectively into teaching and learning to maximize teaching and learning outcomes and welcome the new era of English language learning.

Conflicts of Interest

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

Funding

This work was supported by 2022 Zhaoqing University Quality Project and Teaching Reform Project "Research on Development and Application of Interactive English Reading APP" (Project No. zlgc202216), also supported by 2022 Zhaoqing University Quality Project and Teaching Reform Project "Digital and Intelligent Foreign Language Experimental Teaching Center" (Project No.: zlgc202203).

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