

# Multidimensional Evaluation Of Chinese Learning Apps

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## **Abstract**

*As China's national strength grows and its international standing rises, the wave of "China fever" has swept across the globe. With the rapid advancement of internet technology, various Chinese learning apps powered by smartphones have entered the public eye and emerged as a new learning method. To further refine the design of Chinese learning apps across all aspects and provide insights for individual learners, app developers, and the advancement of Chinese language education, this study employs a multidimensional evaluation approach to investigate the subject. This paper is structured into four sections: First, the introduction outlines the research background, significance, and current landscape; Second, Part Two defines the concept of Chinese learning apps, analyzes their current market landscape, and categorizes them into three types based on primary functions: fun learning apps, exam-focused apps, and comprehensive learning apps. Building on prior research, evaluation criteria for Chinese learning apps are established across four dimensions: interface design, content design, functional design, and hardware design. Three representative apps—Duolingo (hereafter Duolingo), Rosetta Stone (hereinafter referred to as Rosetta), and Pleco as representative apps of different types for a comparative analysis. The findings reveal design shortcomings across these three representative Chinese learning apps: Fun-focused apps offer strong engagement but lack professional depth; Exam-focused apps provide robust functionality but suffer from simplistic interfaces and limited features; Comprehensive apps combine engagement and professionalism yet face high costs and operational challenges. Finally, this study proposes corresponding recommendations to address the aforementioned issues, aiming to provide reference for the future development and improvement of Chinese learning apps.*

**Keywords:** International Chinese Language Teaching; Chinese Learning Apps; Multi-dimensional Assessment

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## **I. Introduction**

### **Research Background and Significance**

#### **Research Background**

China's economy ranks second globally, making it a primary trading partner for over 140 countries and regions worldwide. This economic and trade boom has fueled a surge in Chinese language learning, with learners emerging across the nation and sparking a wave of interest in studying Chinese<sup>[1]</sup>. Data indicates that 85 countries have incorporated Chinese into their national education systems, with teaching networks spanning 212 countries and regions. The number of HSK (Test of Chinese as a Foreign Language) testing centers exceeds 1,400. By the end of 2024, only 7,500 Chinese language teachers worldwide were actively employed and

organized by the Center for Language Education and Cooperation under the Ministry of Education<sup>[2]</sup>. Evidently, Chinese teaching resources are in short supply, urgently requiring technological empowerment to address the challenge of balancing scale and personalization.

Today, we are in the era of social informatization. According to the National Bureau of Statistics, China's internet penetration rate reached 78.6% by 2024<sup>[3]</sup>, enabling digital learning possibilities. The Center for Language Exchange and Cooperation (CLEC) explicitly stated in its 2021 "International Chinese Online Education Action Plan (2021-2025)" that "developing international Chinese online education is an inevitable choice for advancing the intelligent construction of international Chinese education"<sup>[4]</sup>. Building an intelligent, precision-oriented teaching service system has become a national imperative.

International Chinese teaching has rapidly evolved with the AI era, giving rise to a wave of outstanding Chinese learning apps. As intelligent mobile platforms, these apps offer significant advantages over traditional classroom settings by unifying convenience and innovation. This study aims to propose universally applicable evaluation criteria for Chinese learning apps. By assessing representative platforms such as Duolingo, Rosetta, and Pleco, it identifies key issues and provides comprehensive design insights for app development, thereby advancing the global Chinese language education sector.

### **Research Significance**

In the era of social informatization, rapid technological advancement has become closely intertwined with education, giving rise to a multitude of Chinese learning apps that blend convenience with educational value. This study will conduct a multidimensional comparative evaluation of existing Chinese learning apps on the market, focusing on aspects such as engaging design and professional functionality. It aims to identify current issues within these apps and provide comprehensive recommendations to offer insights and guidance for the future design of Chinese learning applications.

#### **Current State of Research**

Currently, Chinese learning apps cover an extremely broad spectrum within the field of Chinese language education, encompassing nearly all aspects of instruction such as vocabulary and grammar. However, a precise search using "Chinese learning apps" as the keyword and relevance as the retrieval criterion reveals that, as of December 2025, only 55 related papers exist on China National Knowledge Infrastructure (CNKI). Research and development in Chinese learning apps remain in their early stages. While the market offers diverse Chinese learning apps, their quality varies significantly. Many exhibit shortcomings in interface design, content organization, functional features, and hardware compatibility, often lacking proper guidance. The market for Chinese learning apps is vast and promising, yet it urgently requires further refinement.

## **II. Multidimensional Evaluation Of Chinese Learning Apps**

### **Conceptual Definition**

#### **Chinese Learning App**

Chinese learning apps are software service programs running on smart devices. As a new media communication tool, these apps leverage mobile learning theory to innovate within the language learning field through engaging and entertaining formats, significantly enhancing interactivity and user participation<sup>[5]</sup>. Their core purpose is to assist users in learning Chinese language and culture. Comparable to English learning apps like BaiCiZhan and BuBeiSanCi, they encompass an extremely diverse range of types, each with distinct

learning focuses. Detailed classifications are provided below.

#### Basic Types of Chinese Learning Apps

##### **Fun Learning Type**

The design philosophy of fun learning apps is to continuously stimulate learners' interest and attention through gamified learning methods and incentive mechanisms, achieving the goal of "learning while playing." Common gamification forms include: completing tasks to earn rewards, idiom fill-in-the-blanks, virtual avatar companionship, and image scene recognition. Examples of such Chinese learning apps include Duolingo, Hanzi Cards, and Ginkgo: Learning Chinese.

##### **Test-Prep Apps**

Test-prep apps focus on delivering exam-relevant knowledge in a concentrated, sustained manner to help learners pass proficiency tests. Common input methods include: daily vocabulary check-ins, rapid test question drills, prioritized study of key/difficult exam points, mock exams, and expert-led courses. Examples include Pleco, e-Learning Chinese, and SuperTest.

##### **Comprehensive Learning Apps**

Comprehensive learning apps combine features from both fun learning and exam-focused types. They maintain appropriate engagement while offering diverse services—daily practice, in-depth study, and specialized exam preparation—to meet learners' evolving needs across different stages. Examples include Rosetta, HelloChinese, and ChineseSkill.

#### Basic Evaluation of Chinese Learning Apps

##### **Evaluation Dimensions**

This study referenced the analysis coding table for Chinese as a foreign language learning apps developed by previous researchers<sup>[6]</sup> and simplified it to formulate an evaluation standard, as shown in the table below:

**Table 2-1: Evaluation Dimensions for Chinese Learning Apps**

Evaluation Criteria		Criterion Description
Interface Design	Aesthetics	Is the UI design visually appealing? Are the icons memorable? Are text, audio, images, and videos harmoniously integrated? Is the color scheme comfortable?.....
	Clarity	Is the UI design intuitive? Is the navigation bar clean and straightforward? Is the overall layout logical and appropriate? Are text, audio, images, and videos clearly visible?.....
Content Design	Professionalism	Is the specialized knowledge accurate? How professional is it? Is it overly dry? Does it meet target learning requirements?.....
	Engagement	How engaging is it? What forms of engagement are used? Does it compromise scientific rigor? Is it lacking in depth?.....
Functional Design	Diversity	Are the functions diverse? Are all functions useful? Is the functional classification clearly structured? Are there redundant functions?.....

	Specialization	Are functions robust? Are any essential features missing?.....
Hardware Design	Stability	Does it run smoothly? Does it experience lag, black screens, crashes, or other errors? Are updates too frequent? Are user accounts and data protected?.....
	Cost-Effectiveness	Is it free? What are the payment methods? Are there value-added services? Are there intrusive ads?.....

## Evaluation Results

Given the overwhelming variety of Chinese learning apps available on the market, this study focuses on a comparative analysis of three representative apps: Duolingo, Rosetta Stone, and Pleco.

**Table 2-2: Representative APP Icons**

App Name	Icon Style
Duolingo	
Rosetta Stone	
Pleco	

### 1. Interface Design

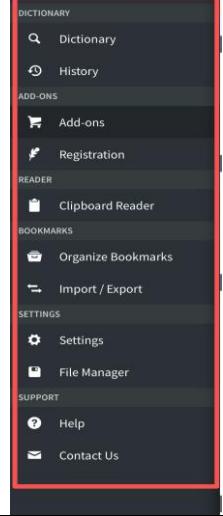
With the widespread adoption of smartphones, the importance of application design continues to grow, making the enhancement of mobile app interface design particularly crucial<sup>[7]</sup>. This paper analyzes three Chinese learning apps from perspectives including creativity, color schemes, and transitions:

Duolingo's "Owl" icon features a novel and engaging style. Its UI design predominantly uses green with rich and diverse color combinations. Various images and animations transition seamlessly, and the virtual avatar design is particularly ingenious. A minor drawback is the navigation bar displaying only icons without text labels, which can hinder user recognition;

Rosetta's yellow icon is highly eye-catching, with a clean and clear interface primarily combining images and text. Each unit is distinguished by a different color, and the navigation bar is clear and well-organized. However, the UI design lacks innovation and feels visually uninspired.

Pleco's interface is serious and minimalist, dominated by text with little support from images or animations. Its monochromatic black-and-white color scheme can easily cause visual fatigue.

**Table 2-3: Representative APP Navigation Bar Styles**

APP Name	Navigation Bar Style
Duolingo	
Rosetta Stone	
Pleco	

## 2. Content Design

When designing software content, it is essential to align with users' learning patterns while also considering their emotional factors<sup>[8]</sup>.

Duolingo's learning content spans over forty languages with diverse courses. Its foundational instruction comprises ten distinct units, with each lesson limited to under ten minutes to accommodate modern users' fragmented time management needs. Initial assessments cover learning fundamentals and objectives to create personalized service plans, demonstrating thoughtful consideration. However, its knowledge structure is overly simplified, lacking depth with vague grammar explanations. Coverage of advanced grammar and complex sentence structures is limited, requiring improvement in specialization.

Rosetta Stone's systematic courses progress sequentially by level, covering diverse content from foundational instruction to vocabulary training and scenario simulations. Its learning model avoids Chinese translations, relying instead on image-based and contextual associations to foster foreign language thinking. However, its zero-native-language immersion design may confuse beginners. The inability to skip foundational lessons prevents advanced learners from rapidly accessing higher-level content. Practice modes are limited and lack engagement.

Pleco's core content draws from authoritative Chinese-English dictionaries, boasting an extensive search database that includes dialects, obscure characters, and classical Chinese—its expertise is unquestionable. Yet it focuses solely on word lookup and Chinese-English translation, lacking essential modules like grammar, listening, speaking, and writing. This prevents international learners from acquiring comprehensive skills, making it difficult to communicate with correct tones and pauses. Advanced content is also relatively limited, offering weaker support for proficient learners.

**Table 2-4: Classification of APP Content Themes**

APP Name	Content Topic Classification (Free Section)
Duolingo	Names, Food, Beverages, Colors, Countries, Occupations, Courses, Prepositions, Tourist Attractions, Daily Necessities, Ordering Food, Introducing Yourself, Sports, Hobbies
Rosetta Stone	Language Fundamentals, Greetings and Introductions, Work and Study, Shopping, Travel, Past and Future, Making Friends and Socializing, Dining and Vacations, Family and Health, Life and the World, Everyday Matters, Situational Events, Tourism and Entertainment, Professional and Hobbies, At Home and Exploring Cities, Fashion and Physical Wellness, Business and Industry, Arts and Academia, Emergencies, Family and Society
Pleco	No specific thematic categorization; primarily dictionary-style search and analysis.

### 3. Functional Design

Intelligent learning experiences stem from interactions between learners and various learning elements. The perceptibility of intelligent technology applications in these interactions can be analyzed in terms of usability (how easily intelligent features are captured by learners' senses and integrated into usage contexts) and usefulness (how effectively intelligent technology supports cognitive goals and operational processes)<sup>[9]</sup>:

Duolingo effectively sustains beginner learners' persistence through mechanisms like daily check-ins, task-based levels, experience point accumulation, and social leaderboards. Its animated avatar encouragement significantly boosts learner engagement. Equipped with professional dictionary tools and rich practical features—including stroke order animations, grammar guides, and text translation—it excels for Chinese character writing and classical Chinese study. However, its training heavily relies on repetitive multiple-choice questions and translation exercises, lacking authentic contextual application and yielding limited effectiveness for exam preparation.

Rosetta Stone emphasizes pronunciation correction and full sentence construction, with image association aiding long-term memory retention. Its AI speech recognition provides real-time feedback on pronunciation accuracy, reinforcing oral practice and facilitating the acquisition of correct Chinese intonation. The scenario simulation feature offers immersive practice to deepen learner comprehension. However, its focus on linguistic structure overlooks the function of popularizing Chinese culture;

Pleco primarily functions as a tool, featuring professional dictionary capabilities. Its search engine integrates two practical dictionaries—CC-CEDICT and PLC—with over 110,000 frequently updated entries. Basic features support word searches via Chinese characters, Pinyin, or English<sup>Error! Reference source not found.</sup>. Advanced functions include handwriting input, voice input, and document translation, offering significant convenience. Offline lookup capability makes it highly accessible for international Chinese learners. However, the absence of social features or gamified incentives may lead to user fatigue over extended use.

#### 4. Hardware Design

Duolingo operates smoothly with minimal errors, but its frequent updates, icon changes, and occasional ads (removable only with a subscription) may cause some user inconvenience;

Rosetta Stone updates moderately but experiences frequent login screen freezes, multiple crashes during operation, and slow loading times, severely impacting the learning experience.

Pleco updates the least, occasionally showing slow loading but generally offering fast search speeds. It is ad-free, requires no registration or internet connection, and boasts high security.

**Table 2-5 represents the number of app updates (January 1, 2025 to October 30, 2025)**

APP Name	Number of version updates
Duolingo	25
Rosetta Stone	8
Pleco	5

Note: Data sourced from the App Store

Duolingo's basic service includes a small amount of advertising, but its introductory courses remain permanently free. The learning content generally meets basic educational needs. Premium memberships offer a one-week trial period and provide advance notifications about auto-renewal, ensuring user safety and demonstrating thoughtful design. Individual memberships can be gifted to friends, while family plans support multiple users, offering excellent value for money.

Rosetta Stone charges higher fees based on language difficulty and learning stage. Its basic service only includes partial English learning, requiring a paid membership for Chinese studies—extremely inconvenient for Chinese learners. Even the basic service costs the equivalent of 109 RMB per month, making its value for money highly debatable.

Pleco offers diverse add-on service packages for users to freely select suitable options. However, its paid features primarily focus on professional translation and text recognition, with limited distinction in Chinese learning capabilities. Basic learning needs can be adequately met without additional payments.

**Table 2-6: APP Payment Methods**

APP Name	Payment Methods
Duolingo	Three pricing tiers ranging from ¥0 to 798 RMB are available as follows: Basic Service: Free; Individual Membership: Annual fee approximately 588 RMB; Super Membership: Annual fee approximately 798 RMB.
Rosetta Stone	Three service tiers priced at 328–1298 RMB are available as follows: Basic Service: Approximately 328 RMB for three months; Intermediate Service: Approximately 798 RMB annually; Premium Service: Approximately 1298 RMB for lifetime access.
Pleco	Package options range from 38 to 1,298 RMB, with representative examples as follows: Basic Service: Approximately 198 RMB;

	Professional Service: Approximately 398 RMB Additional Service: Approximately 68 RMB; ...
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### III. Conclusion

#### Research Summary

Through comparing and evaluating the above three Chinese learning apps, this study found that each major app has its own characteristics, with both strengths and weaknesses. Fun-learning apps like Duolingo feature novel interfaces and engaging content but lack depth. Exam-focused apps like Pleco offer rigorous expertise and powerful features but suffer from overly simple interfaces and tedious learning experiences. Comprehensive learning apps like Rosetta Stone provide ample fun and strong professionalism but come with high costs and unstable performance. In summary, no app currently available on the market meets all evaluation criteria for interface design, content design, functional design, and hardware design. Consequently, Chinese learning apps still possess significant room for future development.

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