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## Applying Electronic Dictionaries in Teaching and Learning Chinese as a Second Language in Digital Context: A Study within Specific Chinese Language Electronic Dictionary in Vietnam

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### Abstract

This study delves into the analysis of the Hanzii electronic dictionary software, focusing on its application in teaching and learning Chinese as a second language within the digital context of Vietnam. Adopting a qualitative methodology, the research extensively examines the software's features, backed by descriptive screenshots, and proposes recommendations for enhancement. Data for the investigation were collected through firsthand engagement with the Hanzii software over three months, providing the researcher an in-depth understanding of its functionalities. The principal features scrutinized include lookup, translation, handwriting practice, notebook, community, and other functionalities. The study underscores Hanzii's potential in facilitating language learning, calling for further research to maximize digital tools' benefits in education. Technology can enrich language learning experiences through continuous innovation, fostering proficiency and cultural understanding.

### Keywords

Electronic dictionaries, Chinese language learning, Digital context, Educational technology

在数字化背景下应用电子词典于中文作为第二语言的教学与学习：基于越南特定中文电子词典的研究

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### 摘要

本研究深入分析了 Hanzii 电子词典软件，重点探讨其在越南数字化背景下的中文作为第二语言教学与学习中的应用。研究采用了定性方法，通过详细的屏幕截图展示了该软件的功能，并提出了改进建议。研究数据通过研究者为期三个月的 Hanzii 软件使用经验收集，深入了解其功能。研究重点分析了查词、翻译、手写练习、笔记本、社区等主要功能。研究强调了 Hanzii 在促进语言学习中的潜力，并呼吁进一步的研究，以最大限度地发挥数字工具在教育中的作用。技术的不断创新可以丰富语言学习体验，促进语言能力和文化理解的提高。

## 关键词

电子词典, 中文学习, 数字化背景, 教育技术

## Introduction

Recently, acquiring Chinese as a second language has emerged as a global phenomenon (Gong et al., 2020), with Vietnam being no exception. As reported by People's Daily Overseas, over 190 countries and regions worldwide have implemented Chinese language teaching projects, 85 countries have integrated Chinese into their national education systems, and the number of individuals learning Chinese outside China exceeds 30 million (人民日报海外版, 2024). More than 30 higher education institutions in Vietnam offer specialized Chinese language training, featuring nearly 30 collaborative programs between Chinese and Vietnamese educational entities, officially sanctioned by the Ministry of Education and Training.

On December 1, 2023, the Minister of Education and Training Promulgated Decision No. 4119/QĐ-BGDĐT, endorsing textbooks for fifth-grade subjects, educational activities, and grade 5 Chinese textbooks, along with grade 3 and grade 4 materials for use in general education institutions. This decision positions Vietnam as the fifth nation to mandate Chinese as a part of its curriculum.

The surge in Chinese language acquisition interest is attributed not solely to linguistic curiosity but also to economic, social, and cultural factors. As China is the world's second-largest economy and a vital trading ally for numerous countries, including Vietnam (Communist Party of Vietnam, 2024), its expanding global influence has spurred a demand for Chinese language proficiency to bolster business ventures, employment opportunities, and cultural exchanges. Furthermore, the growth of the tourism sector and cultural exchange initiatives have significantly contributed to this trend. Vietnamese students recognize that fluency in Chinese facilitates employment in Chinese enterprises and grants access to novel information and insights (Van, 2024).

Nonetheless, pursuing Chinese as a second language is fraught with challenges. The language is renowned for its intricate tone system, comprising four primary tones and one neutral tone, which can perplex learners. Additionally, its writing system presents a formidable obstacle due to its complexity and the vast number of characters, requiring students to memorize thousands of characters, each with multiple meanings and applications. The grammatical structure of Chinese diverges from that of many languages, complicating sentence construction and idea expression for learners.

In the digital era, digital tools have emerged as invaluable aids in language acquisition. Recent research indicates that digital tools enhance learning efficiency and make language acquisition more engaging and interactive (Gagić et al., 2023). Chinese learning applications, such as Duolingo and HelloChinese, and online courses on Coursera and EdX provide a multimedia learning environment that enables comprehensive language exposure. Moreover, the advent of virtual reality (VR) technology in language education allows learners to practice language skills within real-life communication scenarios, thus supporting a more intuitive and vivid learning experience (Lan, 2020).

Among various language learning aids, electronic dictionaries hold a pivotal role. These dictionaries offer distinct advantages, including rapid translations, standard pronunciation guides, and context-based usage examples. Modern electronic dictionaries extend beyond

simple word lookup; they feature character recognition via images, vocabulary retention through flashcards, and pronunciation enhancement via interactive exercises. Compared to traditional paper dictionaries, electronic dictionaries boast superior accessibility and learning efficiency, facilitating study anytime and anywhere while diminishing reliance on books and conventional educational materials (Sarmila et al., 2022).

This study aims to explore the utilization of electronic dictionaries in learning Chinese, focusing on the Hanzii application as a case study. Hanzii, a popular electronic dictionary application in Vietnam, offers numerous functionalities to support effective Chinese language learning. The analysis will examine how Hanzii aids learners in overcoming the challenges associated with acquiring Chinese, from vocabulary lookup and character learning to pronunciation practice and grammar usage. Consequently, this research will contribute to a deeper understanding of digital technology's role in language education and propose future strategies to enhance the efficiency of Chinese language learning.

### **Literature Review The development of the global and Vietnamese digital education landscape in the period 2020 - 2024**

Between 2020 and 2024, the global digital landscape experienced substantial changes, most notably within the education sector. The onset of the COVID-19 pandemic in early 2020 significantly hastened the digital transformation process within educational frameworks as nations worldwide adopted social distancing protocols, necessitating a shift from traditional classroom instruction to online learning modalities (Mehroliya, 2022). This transition has been particularly pronounced in Vietnam, where the government and educational bodies have launched numerous initiatives and enacted supportive policies to facilitate this evolution (Government Office, 2021).

As of April 2024, global internet users reached 5.44 billion, representing 67.1% of the world's population (Statista, 2024). Vietnam, in particular, witnessed a remarkable internet penetration rate of approximately 79% by 2024 (DataReportal, 2024), with expectations of continued growth. The widespread adoption of smartphones has been a critical factor in enhancing internet accessibility, with over 84% of the Vietnamese population owning smartphones by the beginning of 2024. The goal is to achieve 100% smartphone penetration by the end of 2024 (EdTech Agency, 2024), thus broadening access to online educational resources and contemporary teaching technologies.

The availability of online educational resources has expanded significantly, with international platforms such as Coursera, Udemy, Khan Academy, and language learning applications like Duolingo, HelloChinese, and Memrise attracting millions of users globally. Concurrently, Vietnam has seen the emergence of domestic online learning platforms, such as Edumall and Kyna, alongside Vietnamese language learning applications, which are rapidly gaining traction and fulfilling the remote learning requirements of students.

Furthermore, the field of educational technology has witnessed remarkable advancements. Machine learning and artificial intelligence (AI) are increasingly being incorporated into educational tools, enhancing the personalization of learning experiences by offering tailored exercises and recommendations based on individual student needs. AI-driven learning systems can monitor student progress, identify areas of weakness, and suggest additional exercises for improvement.

In addition to AI, virtual reality (VR) and augmented reality (AR) technologies are employed in educational contexts, particularly in language acquisition. These technologies provide learners with immersive and interactive experiences, enabling the practice of communicative skills in realistic scenarios. The implementation of 5G networks further enhances the quality of online learning by offering improved connection speeds and reduced latency, facilitating seamless video streaming and interactive online sessions.

In response to these technological advancements, the Vietnamese government has introduced several policies and initiatives to promote digital transformation in education. Educational institutions have rapidly adopted new technologies, ranging from online learning platforms to integrating AI and VR in teaching methodologies (Phi Long, 2024). The Ministry of Education and Training has endorsed numerous projects and programs to support online learning, ensuring students and educators have access to cutting-edge technologies (Government Portal, 2023).

A notable initiative is the “Distance Learning” program, launched during the pandemic, to ensure educational continuity for millions of students (Government Portal, 2023). Online courses, video lectures, and digital learning materials have been made freely available on various platforms, facilitating uninterrupted learning experiences (Ministry of Education and Training, 2020).

In conclusion, 2020 to 2024 marked a significant evolution in education's digital landscape globally and in Vietnam. The surge in internet penetration and smartphone usage, coupled with technological advancements in education, has opened new avenues for language learning and enhanced the overall quality of educational delivery, catering to the diverse needs of learners.

### **Exploration of Digital Learning Theories**

In the contemporary digital epoch, the confines of space and time no longer restrict the learning process, owing to the swift advancements in information and communication technologies. Since the late 20th century, a proliferation of digital learning theories has surfaced and evolved (Altuna & Lareki, 2015), aiming to elucidate how digital technologies can bolster and refine the educational process. These theories furnish a theoretical scaffolding for incorporating technology within educational realms and assist in elucidating shifts and emerging trends within human learning.

#### *Connectivism*

Propounded by George Siemens and Stephen Downes in 2005, Connectivism posits that knowledge is situated within network connections, and learning constitutes navigating through these information nodes. This theory asserts that learners forge and sustain links with informational sources and other individuals to assimilate knowledge and skills. Fundamental to Connectivism is the notion that knowledge is distributed across a network of connections; learning entails the establishment of these connections and fostering relationships, and decision-making is a critical component of the learning trajectory (Downes, 2022).

Numerous empirical investigations have corroborated the efficacy of Connectivism within digital learning environments. This theory offers a valuable perspective for comprehending and managing teaching and learning processes facilitated by digital technology, particularly in the Internet evolution brought forth by Web 2.0. This evolution has enabled access to

myriad perspectives and opinions, paving the way for novel modes of communication and knowledge creation (Goldie, 2016). Amidst the physical distancing necessitated by the COVID-19 pandemic, Connectivism has played a pivotal role in enabling learners to establish networks with peers and digital resources such as Wikis, blogs, and data clouds (Boyras & Ocak, 2021).

### *Constructivism*

Originating from the works of Jean Piaget and Lev Vygotsky, Constructivism is a theory that underscores the construction of knowledge through personal experience and social interaction. This paradigm posits that learning is derived from practical experiences and environmental engagement. Central to Constructivism is the belief that learning is an active, self-driven process wherein learners synthesize knowledge based on their experiences, and social interaction is instrumental in the learning process (Tan & Ng, 2021).

In the face of the 21st century's demand for learners to be technologically savvy and autonomous in navigating technological advancements, educational practitioners face challenges in equipping young learners with the necessary skills. Constructivism emerges as a highly relevant and suitable pedagogical approach for preparing learners to meet the requirements of the 21st century, emphasizing autonomy and mastery over one's learning process. By applying Constructivism in educational settings, the locus of knowledge acquisition shifts from teacher-centred delivery to a model where students actively construct knowledge. Furthermore, Constructivism has been shown to positively influence the advancement of science, including the global application of microtechnology and linguistic research (Suhendi & Chairani, 2021).

### *The SAMR model*

The SAMR model, developed by Ruben Puentedura in the early 2000s, stands as a theoretical framework designed to assist educators and administrative personnel in evaluating and enhancing the incorporation of technology within educational pedagogy. The framework delineates four distinct levels of technological integration: Substitution, wherein technology serves as a direct replacement for traditional tools without altering their functionality; Augmentation, where technology not only substitutes but also enhances the functions of conventional tools; Modification, through which technology enables significant alterations in the design and content of educational activities; and Redefinition, where technology facilitates the creation of entirely novel educational activities that were previously inconceivable (Tsybulsky & Levin, 2016).

Empirical research has consistently affirmed the SAMR model's efficacy in elevating the quality of education. It provides educators with a dynamic methodology for navigating various technological applications, correlating them with the practical context, the learners' objectives, and the anticipated educational outcomes (Bicalho et al., 2023). The strategic application of this pedagogical framework, particularly in the stages of Augmentation, Modification, and Redefinition, has been linked to notable improvements in student performance. The evolved rendition of the SAMR model has further contributed to enhancing student achievement (Nair & Chuan, 2021).

In conclusion, contemporary digital learning theories, including connectivism, constructivism, and the SAMR model, have significantly influenced and advanced the educational process in the digital age. Applying these theories within digital learning

environments has not only improved the efficacy of learning but has also unlocked new possibilities for learners, as evidenced by numerous empirical studies.

### **The Role of Electronic Dictionaries in Language Education**

Electronic dictionaries have emerged as a critical resource in language education and acquisition. Empirical evidence underscores the significant advantages of using electronic dictionaries, notably in enhancing learners' vocabulary competencies, pronunciation, and overall language comprehension (Sarmila et al., 2023). Comparative analyses indicate that learners who engage with electronic dictionaries exhibit superior retention and understanding of vocabulary compared to their counterparts relying on traditional paper-based dictionaries (Zorigt & Tumurbat, 2022). The distinctive benefits of electronic dictionaries, including rapid search capabilities, access to standard pronunciation guides, and the provision of contextual usage examples, facilitate an efficient and effective language learning experience.

Furthermore, electronic dictionaries contribute to refining pronunciation skills among learners by offering access to standard pronunciation recordings and contextual usage instances. This dual-feature approach ensures that learners are equipped with correct pronunciation techniques and gain insights into the practical application of words in authentic communicative scenarios (Metruk, 2017). Additionally, electronic dictionaries are valuable for augmenting learners' grammatical and semantic proficiencies by incorporating sentence analysis functions and supplying relevant illustrative examples.

Despite the myriad benefits, the application of electronic dictionaries is not devoid of challenges and discrepancies. Investigations by various scholars reveal that the quality of electronic dictionaries is not uniform (Koren, 1997). Factors influencing the quality of an electronic dictionary encompass data accuracy, interactivity, and user interface design. While some electronic dictionaries are enriched with advanced features such as handwriting recognition, word pronunciation, and contextual illustrations, others are limited to providing basic functionalities. Further limitations involve incomplete definitions, the unreliability of specific bilingual dictionaries, developmental oversights by creators, and omissions of definitions and illustrative examples (Maslawati et al., 2017).

### **Hanzii Electronic Dictionary**

The Hanzii electronic dictionary, developed by eUp Joint Stock Company, stands as a premier application for Chinese language learning, not only within Vietnam but also on a global scale. This application transcends the traditional confines of dictionary lookup by incorporating useful learning features that significantly enhance language acquisition.

Since its inception, Hanzii has garnered considerable success. Data from eUP reveals that by 2024, the application has amassed over 4 million downloads—a testament to its popularity and trust in the learning community. Dominating the Chinese learning market in Vietnam with an 80% share, Hanzii has become an essential tool for language learners. This trend is anticipated to persist, bolstered by advancements in educational technology and a growing interest in Chinese language learning.

Hanzii is committed to evolving in tandem with the needs of its users. A notable feature of the application is its ability to recognize Chinese characters through images, a boon for learners who struggle with writing or pronunciation. Furthermore, using interactive

pronunciation exercises, Hanzii enhances vocabulary retention through flashcards and improves speaking skills.

Comprehensive grammar lessons, accompanied by extensive contextual examples and a variety of practice exercises, ensure that learners thoroughly understand grammar and language use. Hanzii's user interface, known for its accessibility and ease of use, promotes an efficient learning experience. Continuous updates have led to several improved versions of the application, each designed to serve the users' needs better.

Available across the web and mobile platforms (iOS and Android), Hanzii enables learners to study at their convenience. The web version offers a rich, user-friendly learning environment, while the mobile application is optimized for smartphones, facilitating on-the-go learning. As of 2024, the iOS and Android platforms have seen over 1 million and 3 million downloads, respectively.

User support is another focal point for Hanzii, with active engagement on social media channels and a dedicated fan page. The official Hanzii fan page on Facebook boasts over 200,000 followers, providing educational content, answering inquiries, and announcing new features. The support team is committed to prompt and efficient user assistance.

Hanzii's excellence has been recognized through several prestigious awards in the tech field, including the 2022 Excellence in Education Technology Product Award and the 2023 Most Effective Learning App Award. These accolades confirm the quality of the Hanzii application and celebrate the relentless dedication of the development team.

In conclusion, the Hanzii electronic dictionary has solidified its standing in Chinese language learning through impressive user engagement and positive feedback. By continuously integrating advanced learning features, Hanzii facilitates efficient dictionary lookups and comprehensively bolsters language proficiency. The achievements of Hanzii underscore both the application's quality and potential for future growth.

### **Methodology**

This study adopts a qualitative methodology to scrutinize the characteristics and functionalities of the Hanzii electronic dictionary software. The methodology encompasses an exhaustive examination of the software's current features, augmented by descriptive screenshots, and proposes recommendations for advancement. The research methodology unfolds as follows:

### **Data Collection**

Information for this investigation was amassed through firsthand engagement with the Hanzii software. Over three months, the researcher engaged extensively with the software, acquiring an in-depth understanding of its features and user interface. Principal features scrutinized include Lookup, Translation, Handwriting Practice, Notebook, Community, and Other Features.

### **Analysis of Features**

A meticulous analysis was conducted on each feature of the Hanzii software:

- **Lookup:** The lookup feature allows users to search for vocabulary, Chinese characters, sentence patterns, and grammatical rules using various input methods, such as Chinese characters, pinyin, and Vietnamese. It provides not only definitions but also

contextual examples, visual illustrations, and recommendations for related words, enhancing learners' comprehension and application of vocabulary in specific contexts.

- **Translation:** The translation feature enables users to convert paragraphs between Vietnamese and Chinese, utilizing handwriting, voice, and image recognition technologies. It aids in deciphering sentence structures, applying vocabulary within complex contexts, and preparing bilingual teaching materials.
- **Handwriting Practice:** This feature facilitates the improvement of users' Chinese writing and memorization skills. It offers detailed information for each character, including stroke order, formation methods, and usage. Users can practice writing characters and receive feedback, enhancing handwriting proficiency and vocabulary retention.
- **Notebook:** The notebook feature allows users to organize and manage vocabulary, which is particularly beneficial for exam preparation, such as the HSK examinations. Users can categorize vocabulary by proficiency levels, create custom vocabulary lists, and engage in review exercises, aiding in vocabulary acquisition and comprehension.
- **Community:** The community feature fosters an open knowledge-sharing environment and user collaboration. Users can exchange insights, share experiences, and seek assistance in various aspects of Chinese language and culture. It encourages active participation, mutual support, and continuous learning within the user community.
- **Other Features:** Additionally, the Hanzii application offers various customization options, such as personalized settings, login features for account synchronization, vocabulary suggestion mechanisms, and word error reporting functionalities, enhancing user experience and engagement.

### **Illustration and Documentation**

Screenshots depicting the principal features and functionalities of the Hanzii software were captured to substantiate the textual analysis. These images provide visual evidence that delivers readers a more transparent comprehension of the software's operational framework.

### **Personal Recommendations**

Drawing from the in-depth analysis, the researcher offers personalized recommendations to augment the Hanzii software. These suggestions are intended to refine the user experience and bolster the acquisition of the Chinese language for learners.

### **Data Analysis**

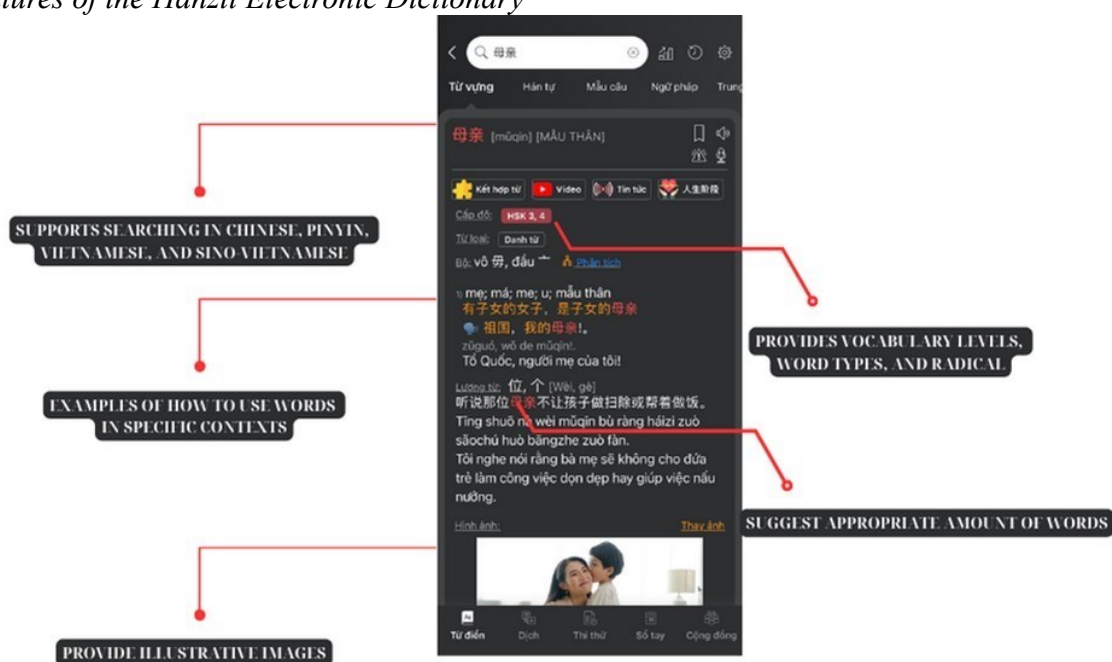
The amassed data was methodically scrutinized to pinpoint the strengths and identify areas for enhancement within the Hanzii software. This analysis concentrated on the software's efficacy, user engagement levels, and educational impact.

### **Discussion Hanzii's Lookup Feature**

The lookup feature of Hanzii represents an advancement in facilitating Chinese language research. This tool allows users to search for vocabulary, Chinese characters, sentence patterns, and grammatical rules using various input methods, including Chinese, pinyin, and Vietnamese. This functionality is essential for enabling users to quickly and effectively identify vocabulary. The search results go beyond mere definitions, providing contextual examples that enhance learners' comprehension and application of vocabulary in specific contexts. To enhance the learning experience, the feature incorporates visual illustrations and recommendations for related words, along with analyses of Chinese character levels and radicals, providing comprehensive support to learners (See Figure 1).

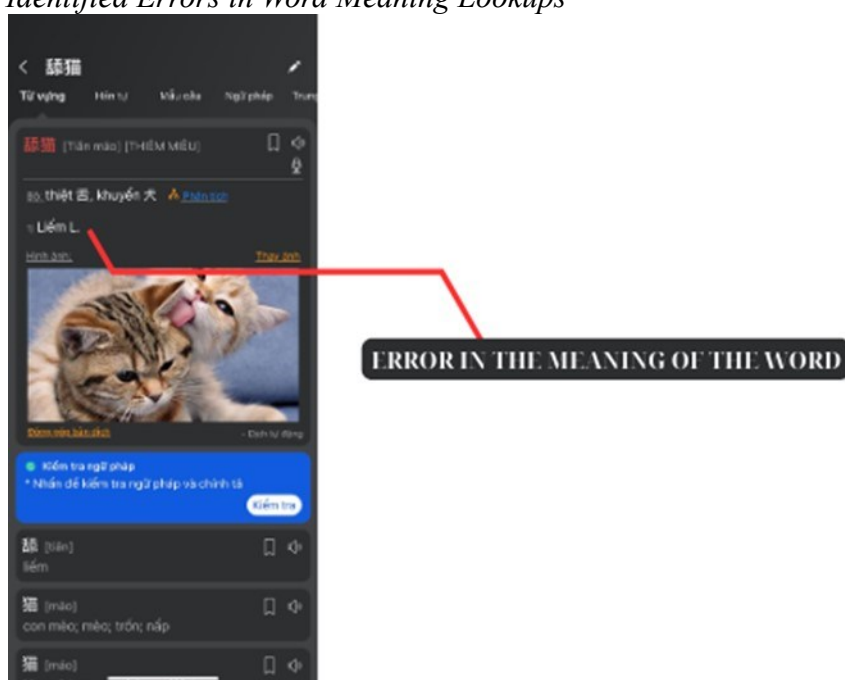


Figure 1  
Features of the Hanzii Electronic Dictionary



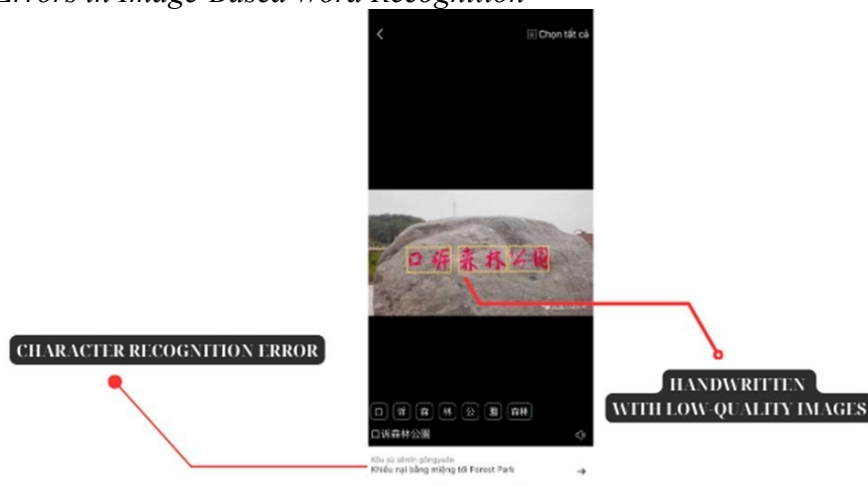
Despite its numerous advantages, the lookup feature is not without shortcomings. There have been observed inaccuracies in the meanings provided by the lookup function (as illustrated in Figure 2). For instance, when searching for the term "舔猫" (tiǎn māo), a modern Chinese slang prevalent on the internet, the results fail to convey the term's nuanced connotation of a fervent cat enthusiast. Instead, the results are limited to mere illustrations, lacking precise definitions.

Figure 2  
Identified Errors in Word Meaning Lookups



Furthermore, the feature's reliability in image recognition and hand-drawn input is compromised under suboptimal lighting conditions (detailed in Figure 3). An example of this is the misrecognition of the term “口岸森林公园” (Kǒu'àn Sēnlín Gōngyuán), where the application confuses “口岸” with “口诉” when identifying through images.

Figure 3  
*Errors in Image-Based Word Recognition*



To enhance the utility of the lookup feature and overcome its current limitations, it is suggested that the database be enriched with contexts of real-life usage by incorporating examples from various texts, articles, and social media. This approach would provide a more nuanced understanding of words. Additionally, implementing deep learning technology could significantly refine the accuracy of handwriting and image recognition features. Extensive testing and adjustments to the recognition algorithm, considering varied lighting conditions and different image qualities, are also recommended to ensure its reliability. A manual correction functionality would allow users to rectify any misidentifications, promptly enhancing the overall user experience.

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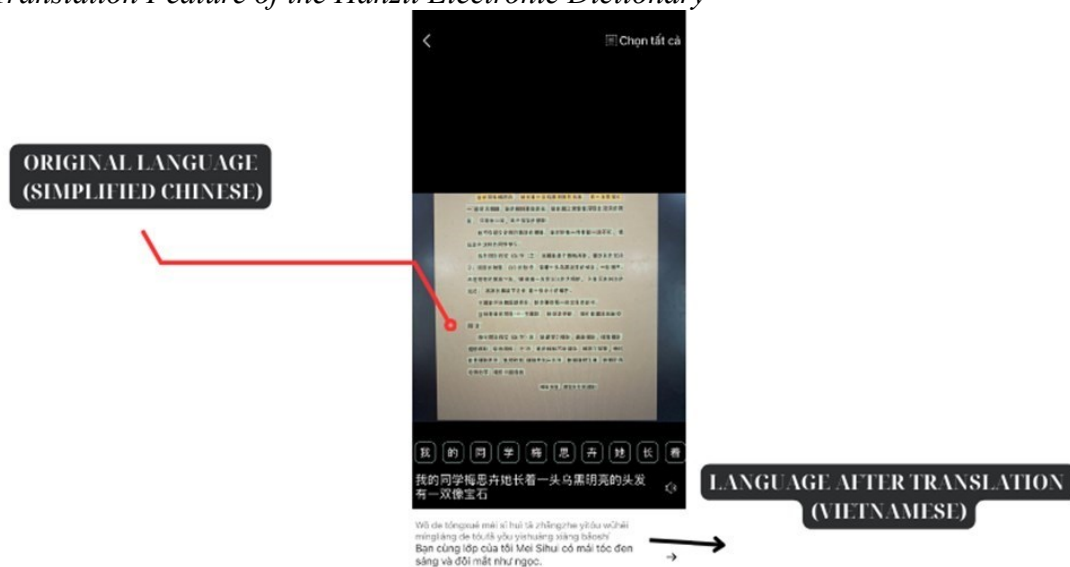
Moreover, revising the user interface to facilitate effortless editing and adding information when errors occur could improve usability. Establishing a rapid feedback mechanism would enable users to report inaccuracies or directly communicate their feedback regarding lookup results, thus aiding in the continuous improvement of the feature. Offering comprehensive usage guidelines and video tutorials would ensure that users fully understand the functionalities and can maximize the application's utility. Furthermore, enhancing and fine-tuning multilingual lookup capabilities is essential to ensure consistency and accuracy across all supported languages. Lastly, developing language-specific lessons and tutorials would aid learners in effectively utilizing the application's features, making the application robust and user-friendly.

In conclusion, while Hanzii's lookup feature significantly contributes to the learning experience, addressing its current limitations through the aforementioned enhancements will undoubtedly elevate its effectiveness and reliability, further empowering users in their pursuit of mastering the Chinese language.

### Hanzii's Translate Feature

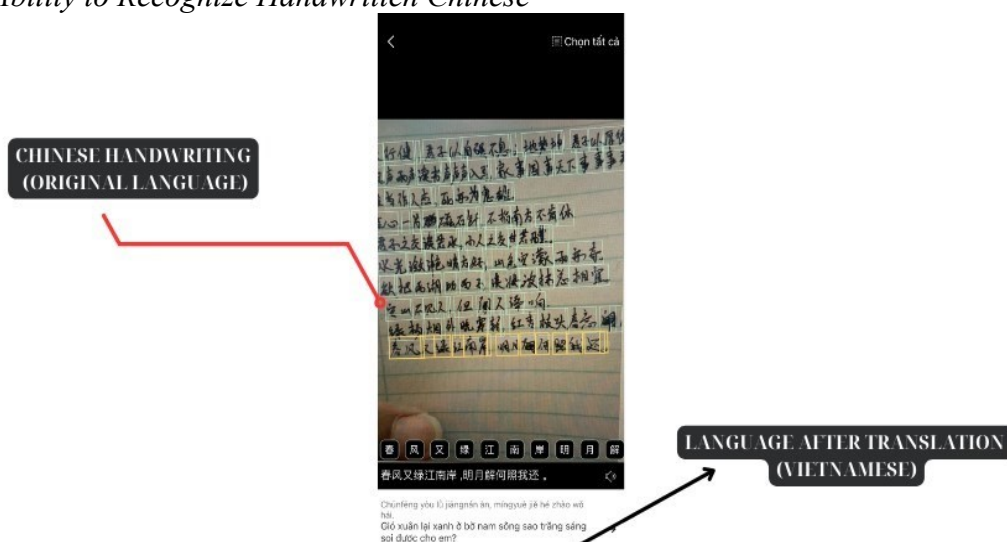
The translation functionality offered by Hanzii encompasses the conversion of paragraphs between Vietnamese and Chinese languages, allowing users to utilize various methods, including handwriting, voice, and image recognition technologies (See Figure 4).

Figure 4  
Translation Feature of the Hanzii Electronic Dictionary



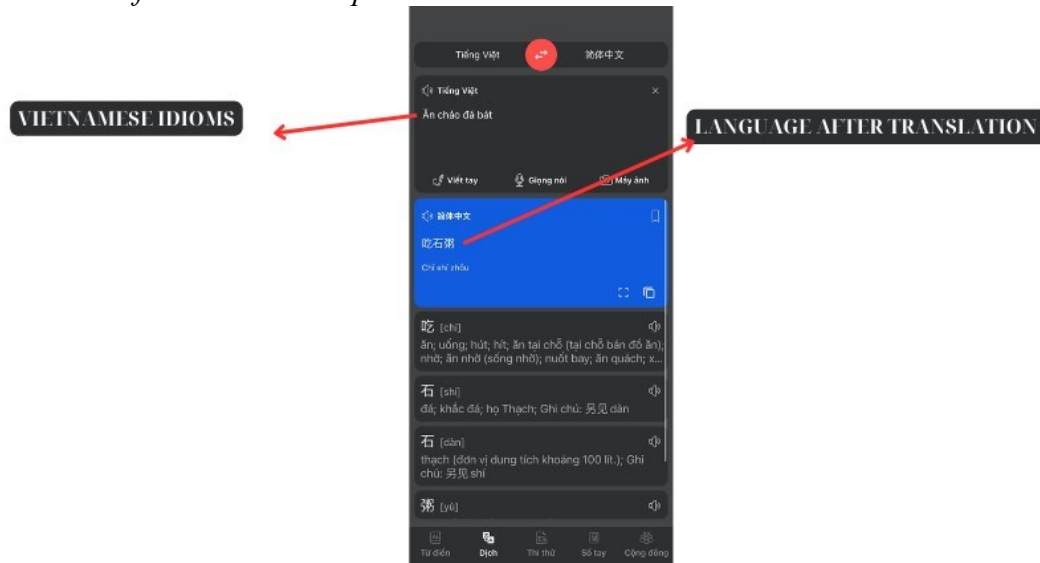
The Translation Feature of the Hanzii Electronic Dictionary enhances the efficiency and precision of the translation process. This feature proves particularly beneficial in deciphering sentence structures and applying vocabulary within complex contexts. The technology's adeptness at recognizing non-standard handwriting (See Figure 5).

Figure 5  
Ability to Recognize Handwritten Chinese



Moreover, the translation feature extends the facility to translate texts and dialogues across multiple languages, thereby facilitating enriched learning and communication experiences. Nonetheless, it is noteworthy that the accuracy of translations may vary, particularly when translating Vietnamese idioms into Chinese (See Figure 6).

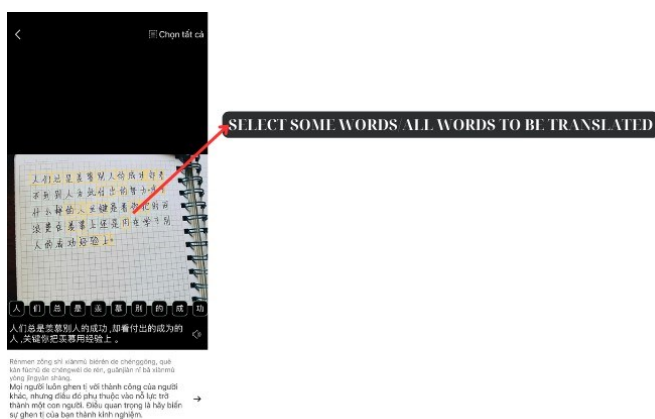
Figure 6  
*Instances of Translation Disparities*



An example provided elucidates the issue: the Vietnamese idiom "An chao da bat" (Eating porridge and kicking a bowl), which conveys the notion of ingratitude and treachery, is inaccurately translated to 吃石粥 (Chī shí zhōu), meaning "eating stone porridge" in Chinese—a translation that fails to capture the idiomatic essence. A more appropriate equivalent would be “过河拆桥” (Guò hé chāi qiáo), translating to “crossing the bridge to draw the plank,” which aptly reflects the intended sentiment of acting ungratefully and treacherously after receiving help.

The application's functionality with translating extensive paragraphs is highlighted (Figure 7). It reveals challenges faced by users in opting to translate either the entirety of the text or select phrases, particularly with passages exceeding 50 characters in length.

Figure 7  
*Challenges in Selecting Translation Content*



To address these identified limitations, Hanzii is committed to the continual expansion and enhancement of its translation database. This includes the incorporation of prevalent idioms and phrases from both Vietnamese and Chinese lexicons to ensure translations are not only accurate but also culturally and contextually relevant. Additionally, improvements to the user interface are underway to facilitate more versatile selection capabilities between translating full texts and specific textual segments, thereby optimizing user experience.

### Hanzii's Handwriting Practice Feature

The Handwriting Practice functionality facilitates enhancing users' Chinese writing and memorization skills. It offers comprehensive details for each character, including Pinyin, stroke order, character formation, six methods of formation, and usage of Chinese characters (六书 - Six Writings) (See Figure 8).

Figure 8

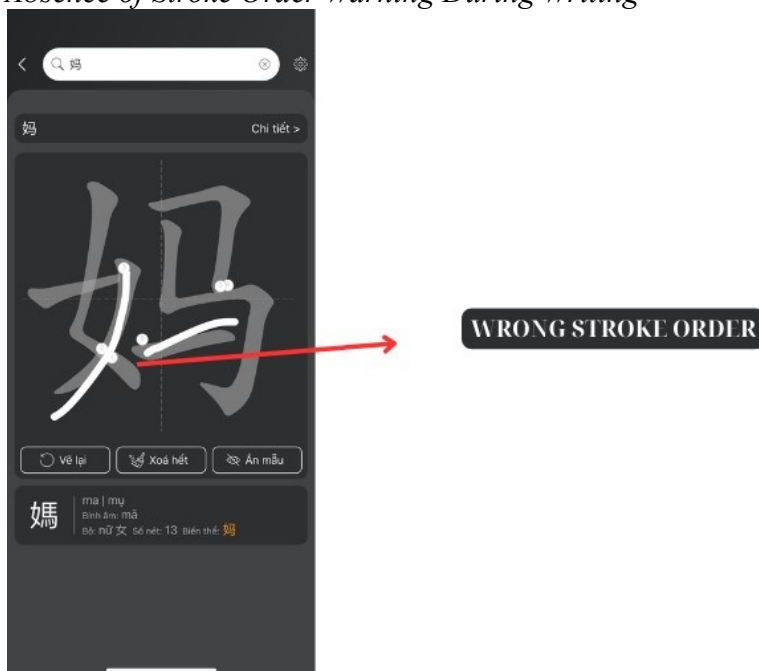
*Information Annotations in the Handwriting Practice Feature*



This utility also aids in identifying incorrect stroke sequences by remaining unresponsive to such actions in the web-based interface and indicating the correct stroke order through sequential numbering (1...N) for mobile platforms (iOS, Android). Nevertheless, a notable challenge for the iOS and Android versions is the absence of immediate feedback or alerts when characters are drawn in an incorrect sequence (See Figure 9).

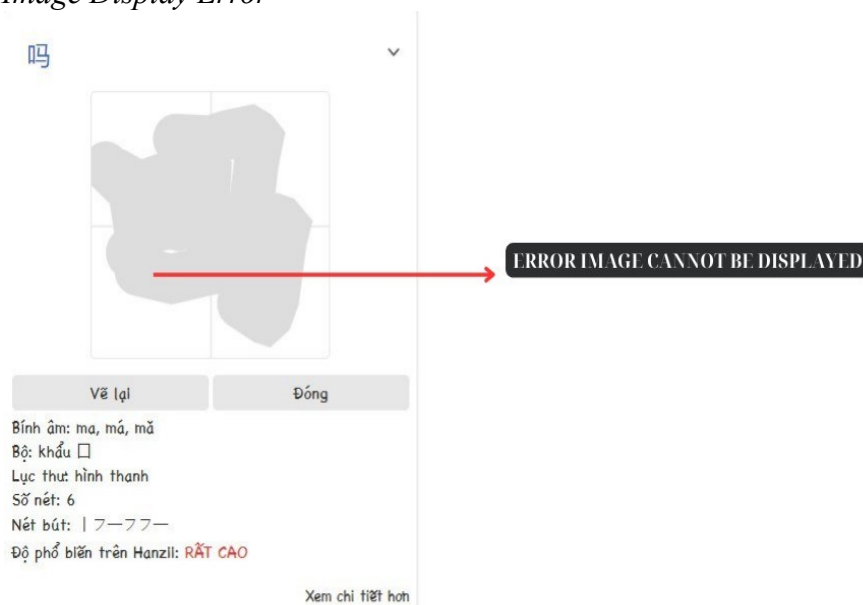
Figure 9

*Absence of Stroke Order Warning During Writing*



Moreover, the writing functionality exhibits operational instability, resulting in visual discrepancies (See Figure 10).

Figure 10  
*Image Display Error*



Hanzii must implement enhancements to the feedback mechanisms on the iOS and Android platforms to address these identified shortcomings. This improvement aims to provide users with explicit notifications or alerts upon executing incorrect stroke sequences, thus facilitating a better understanding and correction of mistakes. Additionally, it is crucial to conduct thorough inspections and rectifications of the operational instabilities plaguing the writing feature to guarantee its reliability and performance during use. Enhancing image quality is also recommended to mitigate improper display or subpar visual fidelity issues. Finally, introducing a refined feedback system on the web is advised to offer users more comprehensive support and guidance concerning proper stroke order practices.

### **Hanzii's Notebook Feature**

The Notebook feature within the Hanzii application is a resource for those acquiring Chinese vocabulary, particularly for individuals preparing for the HSK (Hanyu Shuiping Kaoshi) examinations. This utility allows users to archive and administer vocabulary segmented by HSK levels 1 through 6 whilst also permitting the addition of vocabulary for levels 7 to 9, in alignment with the 3-level and 9-level standards. Such a feature enables learners to substantially and efficiently broaden their lexical repertoire (See Figure 11).

Vocabulary entries in the Hanzii Handbook are meticulously categorized by their respective HSK levels, with the application explicitly indicating the volume of vocabulary necessitated for mastery at each level. This arrangement facilitates learners in monitoring their educational advancement and devising a methodical review strategy. Importantly, each lexeme in the Handbook is accompanied by Chinese and Vietnamese interpretations. It is seamlessly integrated with the application's lookup functionality, thus simplifying the process for learners to ascertain the meanings of words and their application within real-world scenarios (See Figure 12).

Figure 11  
Vocabulary Storage and Classification Features by HSK Level

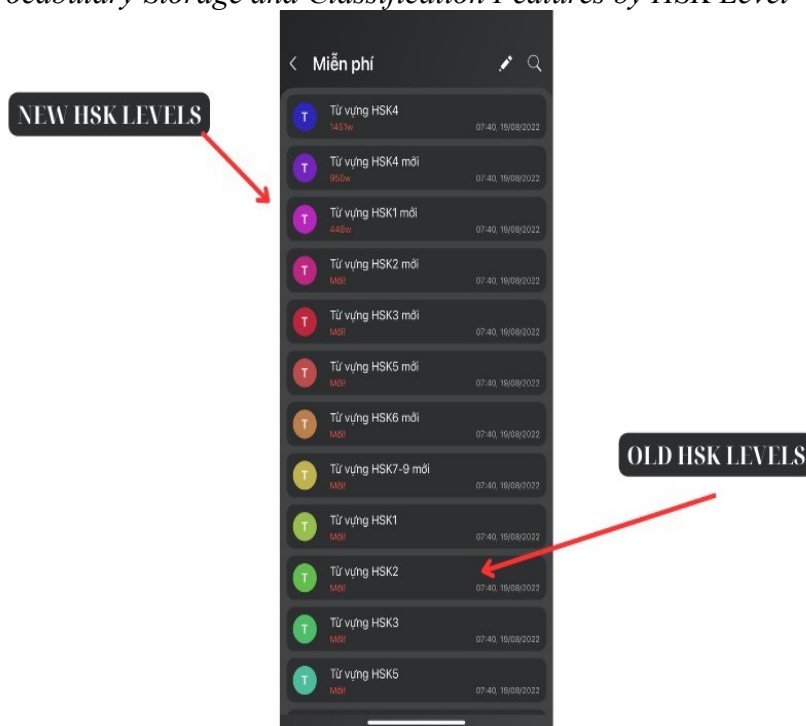
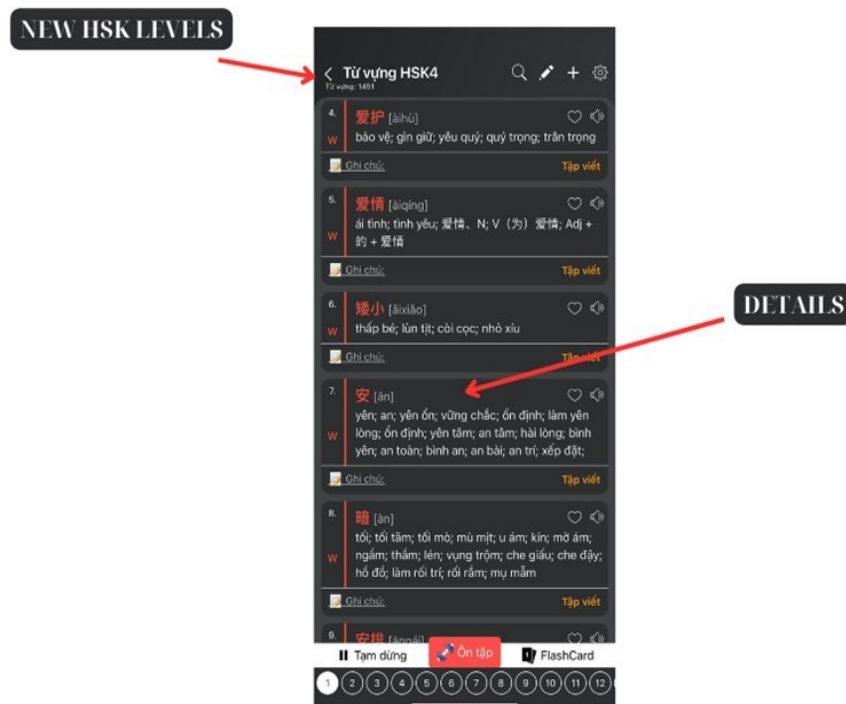
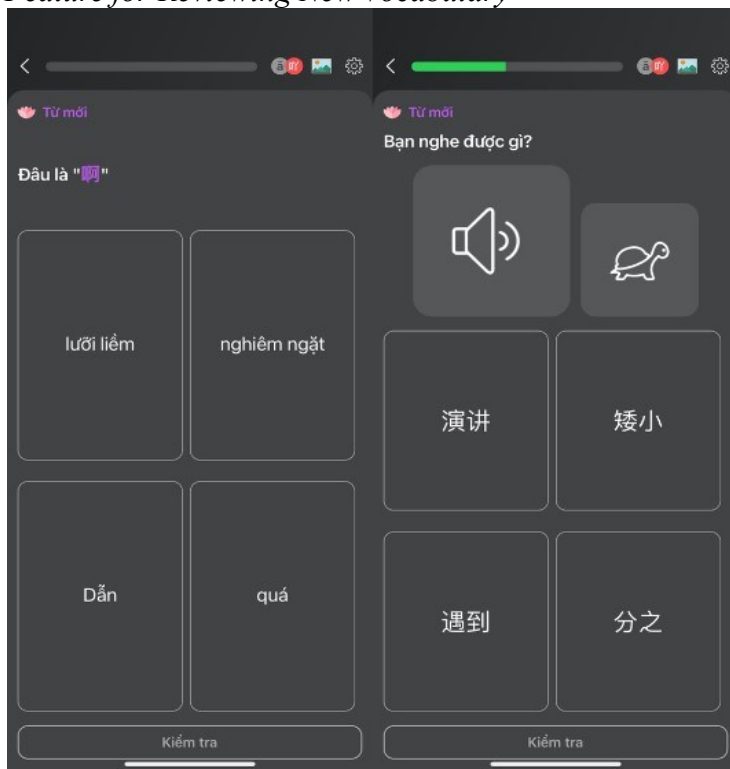


Figure 12  
Features Integrated in Notebook



After the assimilation of new lexemes, the application's review mechanism reinforces acquired knowledge. This feature encompasses a variety of exercises, including the identification of Chinese characters and their Vietnamese meanings, alongside auditory exercises requiring the selection of correct responses, thereby aiding in the enhancement of reading comprehension and listening skills (See Figure 13).

Figure 13  
Feature for Reviewing New Vocabulary



Moreover, an automatic reading function enables users to audibly engage with vocabulary from levels 1 to N, thereby considerably augmenting listening capabilities and vocabulary retention (See Figure 14).

Figure 14  
Automatic Reading Function





A further distinctive aspect of the Hanzii Notebook is the implementation of Flashcards. Through this mechanism, users can categorize vocabulary based on familiarity, swiping right for known words, left for unknown words, and downward for terms of uncertain familiarity (Refer to Figure 15). This facilitates a focused review of vocabulary, requiring further attention.

Figure 15  
*Flashcard Feature*



Additionally, the platform allows for creating bespoke vocabulary folders tailored to individual requirements, thereby enhancing the personalization of the learning trajectory. This feature proves particularly beneficial for learners seeking to augment their vocabulary with essential terms, such as conjugated verbs, quantifiers, or domain-specific lexicons pertinent to accounting, insurance, and healthcare. Consequently, learners are empowered to concentrate on linguistic fields of personal interest or professional relevance (Figure 16).

Nevertheless, it should be noted that the volume of vocabulary associated with specific topics may be constrained, and the absence of a detailed note-taking function for each lexeme could hinder the retention of critical information. Additionally, certain Notebook functionalities necessitate internet connectivity, potentially resulting in inconvenience in the absence of network access. For future enhancements, it is recommended that Hanzii expand its vocabulary repository, incorporate detailed annotative features for each vocabulary item, and facilitate offline functionality for the core features of the Notebook, thereby ensuring accessibility under all connectivity conditions.

Figure 16  
New Word Personalization



### Hanzii's Other Feature

**Community feature:** The Community feature of the Hanzii electronic dictionary creates an open environment, enabling users to share knowledge and exchange information on various aspects of Chinese, such as culture, studying abroad, personal experiences, and finding classmates to share with. This fosters collaboration and learning within the user community, thereby establishing a collaborative development space.

**Settings customization feature:** The Settings customization feature empowers users to personalize numerous settings, including displaying quick lookup results upon closing the application, setting font style and size, enabling traditional character support, and selecting the preferred language. This creates a tailored and convenient experience for users.

**Login feature:** The Login feature allows users to access their accounts to synchronize their learning progress and engage in commenting and idea exchange within the community, fostering deeper connections among community members.

**Vocabulary suggestion feature:** The Vocabulary suggestion feature enables users to propose notes or add information to vocabulary entries if they notice any omissions in meaning or illustrative examples. This facilitates the creation of personal notes and contributes to the enhancement and refinement of the vocabulary database.

**Word error reporting feature:** The Word error reporting feature empowers users to report inaccuracies or deficiencies in vocabulary entries, thereby aiding in enhancing the quality and accuracy of the electronic dictionary and providing a more enjoyable user experience.

### **Hanzii Electronic Dictionary Application for Learning Chinese**

Learners may significantly benefit from utilizing the Hanzii application to enhance their competencies and understanding while acquiring Chinese. This multifaceted tool offers numerous features that cater to different aspects of language learning, thereby enriching the educational experience.

Learners can employ the lookup feature to ascertain the definition and application of vocabulary encountered throughout their studies. For instance, upon discovering the novel term "中国" (Zhōngguó), translating to "China," learners can consult Hanzii to comprehend its application across various contexts. For example, in the sentence "我喜欢学习中国的历史" (Wǒ xǐhuān xuéxí Zhōngguó de lìshǐ), which translates to "I enjoy studying the history of China," Hanzii provides contextually rich examples that help learners understand how the term fits into different sentences and scenarios. This contextual learning is crucial for developing a deeper understanding of vocabulary and its practical usage.

To refine pronunciation, learners may utilize the lookup feature to listen to and replicate vocabulary and sample sentences pronounced accurately. For instance, after acquiring the term "音乐" (yīnyuè), meaning "music," learners can leverage the pronunciation feature to listen to the word's correct pronunciation and subsequently attempt to mimic the speaker's accent. This auditory reinforcement is essential for mastering the tonal and phonetic nuances of the Chinese language, which can often be challenging for non-native speakers.

Learners can use the notebook feature to devise personal review exercises or use available tests to assess their knowledge in revising lessons. For instance, after learning the new vocabulary term "学生" (xuéshēng), translating to "student," learners can utilize Hanzii's review feature to verify their recollection of the term. This feature not only helps in reinforcing memory but also allows learners to track their progress systematically, identifying areas that require more focus.

Moreover, learners can exploit Hanzii's vocabulary list creation feature to personalize their learning trajectory. They can curate their vocabulary lists, customizing the learning process to suit their distinct requirements, rendering the educational journey more compelling. For example, should learners wish to concentrate on acquiring vocabulary related to "Chinese Cuisine," they might create a dedicated vocabulary list and include terms such as "炒饭" (chǎofàn), meaning "fried rice," or "麻婆豆腐" (mápó dòufu), meaning "tofu in spicy sauce."

This targeted approach helps in making the learning process more relevant and engaging, aligning with the learner's personal interests or professional needs.

Hanzii's writing practice feature is another valuable tool that aids in mastering the art of Chinese character writing. Learners can practice the correct formation of characters by following the stroke order guidelines provided by Hanzii. For example, when learning how to write "汉字" (hànzì), meaning "Chinese characters," Hanzii offers a step-by-step guide on the stroke order, which is crucial for writing characters accurately and legibly. This practice helps in developing muscle memory for character writing, an essential skill for proficiency in written Chinese.

The community feature of Hanzii presents a substantial advantage for learners in pursuing Chinese language proficiency. Via this feature, learners can derive knowledge from textbooks and engage in a community to exchange insights, share experiences, and offer mutual support. For instance, when learners encounter challenges in comprehending a concept or a specific grammatical structure, they may initiate a discussion on Hanzii's forum to solicit assistance from the community. Concurrently, learners can contribute their learning experiences to aid fellow community members. Through such interactions, learners broaden their knowledge base and foster a positive and supportive educational atmosphere among the community members. Additionally, Hanzii's translation feature proves exceedingly beneficial in an educational setting. Educators can employ this feature to translate texts from Vietnamese to Chinese and vice versa, aiding students in gaining a deeper understanding of grammar and vocabulary in specific contexts. For example, in lessons focusing on sentence structure, a Vietnamese text can be translated into Chinese, offering students visibility into the structural divergences between the two languages. This practice not only aids in comprehension but also enhances translation skills, which are valuable in advanced language learning stages.

Lastly, the customization options provided by Hanzii allow learners to tailor the application to their individual learning needs. Features such as adjusting font size, enabling traditional character support, and setting language preferences ensure that the learning environment is comfortable and conducive to the learner's preferences. Educators can guide students in optimizing these settings to enhance their study efficiency.

In conclusion, the Hanzii electronic dictionary application emerges as a comprehensive and efficacious tool in the facilitation of Chinese language education. Its diverse functionalities, encompassing research, translation, handwriting practice, vocabulary management, community engagement, and customization options, deliver practical benefits that enable educators to teach more efficiently and students to learn with greater ease. The incorporation of Hanzii into educational methodologies not only conserves time but also elevates the caliber of education, fostering profound and sustainable acquisition of the Chinese language and culture. This holistic approach ensures that learners are well-equipped to achieve fluency and cultural competency in Chinese, making Hanzii an indispensable resource in language education.

### **Hanzii Electronic Dictionary Application for Teaching Chinese**

Hanzii's suite of features extends multifaceted support to students' autonomous learning endeavors and offers considerable advantages within the educational process. Educators are empowered to utilize the platform's research functionality to devise comprehensive and precise solutions. For instance, when introducing new vocabulary in the classroom,

educators can explore the term "学习" (study) on Hanzii. The platform not only furnishes a precise definition but also contextual examples, such as "我喜欢学习中文" (I like learning Chinese), facilitating the illustration of vocabulary usage within real-world scenarios, thereby enriching the pedagogical experience.

Moreover, during instructional sessions, should learners encounter challenges with specific vocabulary or grammatical structures, educators can promptly engage the training feature to address inquiries. As an illustration, if a query arises regarding the application of "跑步" (jogging), the educator can conduct research within Hanzii, uncovering example sentences like "每天早上我都去跑步" (Every morning I go jogging), which serves to clarify and simplify the explanation.

The translation functionality present in Hanzii also proves exceedingly beneficial in an educational setting. Educators may employ this feature to translate texts from Vietnamese to Chinese and vice versa, aiding learners in gaining a deeper understanding of grammar and vocabulary in specific contexts. For example, in lessons focusing on sentence structure, a Vietnamese text can be translated into Chinese, offering students visibility into the structural divergences between the two languages.

Additionally, the translation feature aids educators in the preparation of bilingual teaching materials. A brief essay on environmental topics, for example, can be translated into Chinese, following which educators may request students to engage in a back-translation exercise into Vietnamese, fostering reading comprehension and translation capabilities.

The mastery of Chinese character writing constitutes a critical component of Chinese language acquisition. Hanzii's writing practice feature enables educators to learn and demonstrate the correct formation of Chinese characters. Utilizing this feature, educators can guide learners in the inscription of new words, such as "汉字" (Chinese characters), with Hanzii providing clear displays of stroke order for student follow-along, ensuring accurate and aesthetically pleasing character writing.

In contexts of online or independent study, learners may leverage this feature for practice, subsequent to which peers may review and provide corrections through submissions. This process not only augments handwriting proficiency but also facilitates effective vocabulary retention.

The notebook feature within Hanzii allows for the systematic organization and management of vocabulary, an aspect particularly beneficial in preparation for HSK examinations. Educators can instruct students to categorize vocabulary by HSK level, encouraging daily note-taking, example sentence composition, and practice. For instance, in teaching HSK level 3 vocabulary, learners can be directed to document new words in their notebooks, inclusive of example sentences and grammatical annotations, enhancing not only vocabulary acquisition but comprehension of application in real-life contexts.

Hanzii's community dimension fosters an open forum for the exchange of knowledge and experiences pertaining to various facets of the Chinese language and culture, including study abroad experiences and personal insights. Educators can harness this feature to motivate student engagement in discussions, sharing of learning experiences, and collaborative study endeavors. For example, educators might orchestrate online discussions

on themes of Chinese culture, encouraging learners to seek out information, contribute articles, and partake in discussions within the Hanzii community, thereby not only broadening their knowledge base but also fostering a learning environment characterized by mutual support and motivation.

Furthermore, Hanzii's customizable settings feature offers users a diverse array of configuration options, including dynamic display of research outcomes, textual and dimensional adjustments, character conversion system support, and language prioritization. Educators can guide learners in tailoring the application to suit individual learning requirements, thereby enhancing the overall learning experience.

In conclusion, the Hanzii electronic dictionary application emerges as a comprehensive and efficacious tool in the facilitation of Chinese language education. Its diverse functionalities, encompassing research, translation, handwriting practice, vocabulary management, community engagement, and customization options, deliver practical benefits that enable educators to teach more efficiently and learners to learn with greater ease. The incorporation of Hanzii into educational methodologies not only conserves time but also elevates the caliber of education, fostering profound and sustainable acquisition of the Chinese language and culture.

### **Conclusion**

This study has uncovered several key findings through an in-depth examination of the Hanzii electronic dictionary software. The software offers comprehensive features to support learners in their Chinese language acquisition journey. These features encompass lookup, translation, handwriting practice, notebook, and community functionalities. The analysis suggests that Hanzii shows potential as a valuable asset for facilitating the teaching and learning of Chinese as a second language within the digital landscape of Vietnam.

Despite the thorough exploration of the Hanzii software, several limitations in the study should be acknowledged. Firstly, the study's sample size was limited to the researcher's engagement with the software over three months, potentially constraining the generalizability of the findings. Additionally, the study primarily focused on the software's features and functionalities, with less emphasis on user feedback and long-term educational outcomes. Future research endeavours should address these limitations to provide a more comprehensive understanding of the software's efficacy and impact.

Building upon the insights gained from this study, several avenues for future research emerge. Firstly, longitudinal studies could investigate the long-term effectiveness of using the Hanzii software in language learning contexts, tracking learners' progress and proficiency over extended periods. Furthermore, comparative studies could be conducted to evaluate the efficacy of Hanzii in comparison to other digital language learning tools. Additionally, research exploring the socio-cultural and demographic factors influencing learners' engagement with digital language learning resources could provide valuable insights into tailoring educational interventions to diverse learner populations.

In conclusion, the findings of this study underscore the potential of the Hanzii electronic dictionary software in facilitating the teaching and learning of Chinese as a second language in the digital landscape of Vietnam. While acknowledging its strengths, it is essential to address the study's limitations and pursue further research to fully harness the benefits of digital language learning tools in educational settings. Through ongoing

research and innovation, educators and learners can leverage technology to enrich language learning experiences and foster linguistic proficiency and cultural understanding students in optimizing these settings to enhance their study efficiency.

## References

- Altuna, J., & Lareki, A. (2015). Analysis of the use of digital technologies in schools that implement different learning theories. *Journal of Educational Computing Research*, 53(2), 205-227. <https://doi.org/10.1177/0735633115601609>
- Bicalho, R. N. d., Coll, C., Engel, A., et al. (2023). Integration of ICTs in teaching practices: Propositions to the SAMR model. *Education Tech Research Dev*, 71, 563–578. <https://doi.org/10.1007/s11423-022-10169-x>
- Boyras, S., & Ocak, G. (2021). Connectivism: A Literature Review for the New Pathway of Pandemic-Driven Education. *Online Submission*, 6(3), 1122-1129.
- Communist Party of Vietnam. (2024). Vietnam - China maintain good economic relations, facilitate trade and investment. *Communist Party of Vietnam*. <https://dangcongsan.vn/kinh-te-va-hoi-nhap/viet-nam-trung-quoc-duy-tri-quan-he-kinh-te-tot-dep-tao-thuan-loi-cho-thuong-mai-va-dau-tu-660256.html>
- DataReportal. (2024). Digital 2024: Vietnam. Retrieved from <https://datareportal.com/reports/digital-2024-vietnam>
- Demirkol Orak, S. (2021). In Between 21st Century Skills and Constructivism in ELT: Designing a Model Derived From a Narrative Literature Review. *World Journal of English Language*, 11(2), 166-176.
- Downes, S. (2022). Connectivism. *Asian Journal of Distance Education*, 17(1). Retrieved from <http://asianjde.com/ojs/index.php/AsianJDE/article/view/623>
- EdTech Agency. (2024). Vietnam aiming for 100% smartphone use by the end of 2024. Retrieved from <https://edtechagency.net/vietnam-aiming-for-100-smartphone-used-by-the-end-of-2024/>
- Gagić, A., Gajić, T., Gavranović, V., Maenza, N., & Veljković Michos, M. (2023). Digital tools for language learning: Exploring teachers' innovative and engaging practices. Paper presented at *Sinteza 2023 - International Scientific Conference on Information Technology, Computer Science, and Data Science*. <https://doi.org/10.15308/Sinteza-2023-281-287>
- Gong, Y., Gao, X., & Lyu, B. (2020). Teaching Chinese as a second or foreign language to non-Chinese learners in mainland China (2014–2018). *Language Teaching*, 53, 44–62. <https://doi.org/10.1017/S0261444819000387>
- Goldie, J. G. S. (2016). Connectivism: A knowledge learning theory for the digital age? *Medical Teacher*, 38(10), 1064–1069. <https://doi.org/10.3109/0142159X.2016.1173661>
- Government Office. (2021). Prime Minister directs implementation of safe teaching solutions to ensure quality education in response to the COVID-19 pandemic. *Government Portal*. <https://vpcp.chinhphu.vn/thu-tuong-chi-thi-trien-khai-giai-phap-to-chuc-day-hoc-an-toan-bao-dam-chat-luong-giao-duc-dao-tao-ung-pho-voi-dai-dich-covid-19-11526428.htm>
- Government Portal. (2023). Digital transformation in education: Proactively adapting, creating breakthroughs. Retrieved from <https://xaydungchinh sach.chinhphu.vn/chuyen-doi-so-trong-giao-duc-chu-dong-bat-nhip-tao-buoc-dot-pha-119230518114547454.htm>
- Government Portal. (2023). Special program to support millions of disadvantaged students. Retrieved from <https://thutuong.chinhphu.vn/chuong-trinh-dac-biet-ho-tro-hang-trieu-hoc-sinh-sinh-vien-kho-khan-10939778.htm>

- Koren, S. (1997). Quality versus Convenience: Comparison of Modern Dictionaries from the Researcher's, Teacher's and Learner's Points of View. *TESL-EJ*, 2(3), A-2. Retrieved from <https://www.cc.kyoto-su.ac.jp/information/tesl-ej/ej07/a2.html>
- Lan, K. Y. (2020). Immersion into virtual reality for language learning. In K. Y. Lan (Ed.), *Adult and Second Language Learning. Psychology of Learning and Motivation*. <https://doi.org/10.1016/bs.plm.2020.03.001>
- Maslawati Mohamad, Nuraidawany Rashid, & Wan Nur'ashiqin Wan Mohamad. (2017). The advantages and disadvantages of e-dictionaries to enhance vocabulary learning of ESL learners. *The Asian Conference on Education & International Development 2017 Official Conference Proceedings*.
- Mehroliya, S., Alagarsamy, S., & Solaikutty, V. M. (2022). Digital transformation in education amid COVID-19. *ResearchGate*. <https://doi.org/10.13140/RG.2.2.36954.08610>
- Metruk Rastislav. (2017). The use of electronic dictionaries for pronunciation practice by university EFL students. *Teaching English with Technology*, 17(4), 38-51.
- Ministry of Education and Training. (2020). Enhancing ICT application in national education. Retrieved from [https://moet.gov.vn/giaoducquocdan/tang-cuong-ung-dung-cntt/Pages/tin-tuc.aspx?ItemID=6703&fbclid=IwAR03bEN5y9iYuiqVq1AiOjRTWsOmcIK01RiWSNwm0nR\\_NHoEKNsoYxKTwBU](https://moet.gov.vn/giaoducquocdan/tang-cuong-ung-dung-cntt/Pages/tin-tuc.aspx?ItemID=6703&fbclid=IwAR03bEN5y9iYuiqVq1AiOjRTWsOmcIK01RiWSNwm0nR_NHoEKNsoYxKTwBU)
- Nair, R. S., & Chuan, T. C. (2021). Integrating technology that uses modified SAMR model as a pedagogical framework in evaluating learning performance of undergraduates. *The Educational Review, USA*, 5(10), 373-384.
- 人民日报海外版 . (2024). 以中文推进交流互鉴 . *新浪财经*. <https://finance.sina.com.cn/jjxw/2024-01-12/doc-inacfam5465710.shtml>
- Phi Long. (2024). Application of VR, AR, and artificial intelligence in education and training. *VTV*. Retrieved from <https://vtv.vn/cong-nghe/ung-dung-cong-nghe-vr-ar-va-tri-tue-nhan-tao-trong-giao-duc-va-dao-tao-20240514174159214.htm>
- Sarmila, N., Yauri, A. M., & Resyadi, H. (2022). The Effectiveness of Electronic Dictionary in Learning Vocabulary at Indonesian Junior High School Context. *International Journal of Research in English Education and Applied Linguistics*, 3(2). <https://doi.org/10.30863/ijretal.v3i2.3903>
- Sarmila, N., Yauri, A. M., & Resyadi, H. (2023). The effectiveness of electronic dictionary in learning vocabulary at Indonesian junior high school context. *International Journal of Research on English Teaching and Applied Linguistics*, 3(2), 40-44. <https://doi.org/10.30863/ijretal.v3i2.3903>
- Statista. (2024). Worldwide digital population 2024. Retrieved from <https://www.statista.com/statistics/617136/digital-population-worldwide/>
- Suhendi, A., Purwarno, P., & Chairani, S. (2021). Constructivism-Based Teaching and Learning in Indonesian Education. *KnE Social Sciences*, 5(4), 76-89. <https://doi.org/10.18502/kss.v5i4.8668>
- Tan, C., & Ng, C. S. (2021). Constructivism in education. In *Oxford Research Encyclopedia of Education*.
- Thai Nguyen Provincial Portal. (2023). Improving the quality of Chinese language teaching in Vietnam. *Thai Nguyen Provincial Portal*. [https://thainguyen.gov.vn/vi\\_VN/cong-tac-giao-duc/-/asset\\_publisher/wlmqDeuPXWAp/content/nang-cao-chat-luong-day-hoc-tieng-trung-quoc-o-viet-nam](https://thainguyen.gov.vn/vi_VN/cong-tac-giao-duc/-/asset_publisher/wlmqDeuPXWAp/content/nang-cao-chat-luong-day-hoc-tieng-trung-quoc-o-viet-nam)



Tsybulsky, D., & Levin, I. (2016, March). SAMR framework for study technology integration in science education. In *New perspectives in science education conference proceedings of the 5th edition*.