

LINGUISTICS AND VIETNAMESE LINGUISTICS

CHALLENGES OF PAPER-BASED BILINGUAL DICTIONARIES IN THE DIGITAL AGE: A CASE STUDY OF ENGLISH-MAJORED STUDENTS AT TWO UNIVERSITIES

NGUYEN VIET KHOA*

ABSTRACT: In the digital age, paper-based bilingual dictionaries face growing obsolescence due to technological advancements. This study examines their limitations against the rise of digital alternatives. A survey of 137 English-majored students reveals that 60.6% rarely or never use paper-based dictionaries, citing slow lookup (91.9%) and bulkiness (89.8%), while 75.9% use digital tools daily. The survey reveals undergraduates drive digital adoption, while TESOL students retain print for academic needs and accuracy trust. As digital dictionaries, mobile apps, and AI-driven tools gain traction, user preferences shift from print. This paper explores these trends, learner needs, and lexicography's future, suggesting that while print retains niche value, its practicality remarkably diminishes in an era of instant digital access.

KEY WORDS: bilingual dictionaries; digital technology; English-majored students; print vs. digital; lexicography.

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1. Introduction

Bilingual dictionaries have long served as essential tools for language learners, translators, and scholars, their printed pages preserving lexical knowledge in tangible form (Karl & James, 2013). These resources, such as early English-Vietnamese dictionaries, standardized cuisine terms like “nước mắm” (fish sauce), “phở” (noodle soup) and “bánh mì” (spicy sandwich) facilitating cross-cultural understanding and earning trust among educators. However, digital technology has transformed this landscape, offering instant lookups, multimedia features, and real-time translations that challenge print's dominance (Lew, 2024; Rundell, 2015). This shift reflects broader technological advancements and comprehensive digital transformation, rendering static print formats increasingly impractical for modern users who demand efficiency and accessibility (Atkins and Rundell, 2008; Nguyen, 2021).

A survey conducted on March 12-15, 2025, with 137 participants with 108 first- and third-year English-majored undergraduates from Hanoi University of Science and Technology (aged 18-25) and 29 TESOL master's students from Hanoi University (aged 26-50) underscores this transition. Findings reveal that 60.6% rarely or never use paper dictionaries, citing their bulkiness and slow lookup processes, while 75.9% rely on digital or AI-driven tools daily or weekly, valuing their convenience and interactivity (Laufer & Hill, 2000). This diverse sample suggests potential age-based differences: younger undergraduates, immersed in digital ecosystems, may favor tools like Google Translate, whereas older TESOL students might retain print habits due to academic traditions or familiarity, a pattern consistent with Pellicer-Sánchez and Perez (2024) research on electronic dictionary adoption across learner groups.

Despite their historical significance, paper-based bilingual dictionaries face mounting challenges in this digital era. Their static nature, physical bulk, and lack of modern features struggle to meet the demands of tech-savvy users, particularly English-majored students and educators-in-training (Atkins & Rundell, 2008). This study investigates these issues by examining the limitations of paper dictionaries in the current era, exploring the influence of digital tools on user habits, and assessing the potential future role of print dictionaries. By blending survey data from these 137 respondents with

*Dr; Faculty of Foreign Languages; Email: khoa.nguyenviet@hust.edu.vn

broader trends, this paper charts the evolving trajectory of bilingual lexicography, focusing on English-majored learners and MA TESOL students as a case study.

2. Literature Review

The transition from print to digital bilingual dictionaries has been a central theme in lexicographic research, reflecting technological progress and shifting user needs. This review synthesizes prior studies, offering expanded critiques to frame this study's contribution.

Historically, print bilingual dictionaries were authoritative tools for cross-linguistic understanding. Hartmann and James (1998) emphasize their role in standardizing lexical data, a process exemplified in early English-Vietnamese dictionaries that codified terms like “nước mắm” (fish sauce) for English learners, earning trust among educators. Their work meticulously details print's cultural significance, yet its nostalgic lens overlooks practical drawbacks, like the inability to update terms like “phở” as its global usage evolves, leaving a gap for later research to fill.

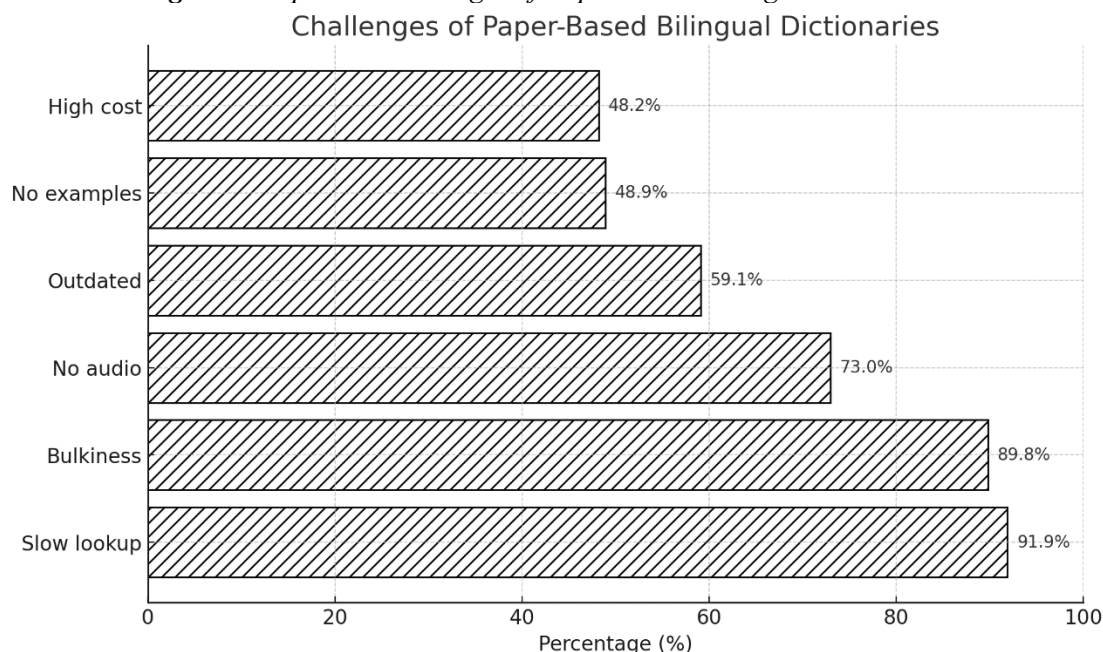
Digital advancements have challenged print's dominance. Lew (2024) and Brewer (2013) praise online dictionaries like Longman Dictionary of Contemporary English (LDOCE Online) and Oxford English Dictionary (OED Online) for real-time updates and broad coverage, such as adding “bánh mì” as a loanword faster than print cycles allow. These authors' analysis is compelling but overly optimistic, assuming universal digital access while ignoring barriers like unreliable internet in rural Vietnam, a critique echoed by Pellicer-Sánchez and Perez (2024). Atkins and Rundell (2008) argue for the educational benefits of print dictionaries, suggesting that their structured formats promote focused learning, minimizing digital distractions. However, their argument is primarily theoretical and lacks empirical evidence, which weakens its position against the efficiency of digital tools. Similarly, Rundell (2015) explores the transition from print to digital dictionaries, addressing economic and pedagogical aspects.

User behavior studies highlight digital preferences. Laufer and Hill (2000) found that multimedia features, like audio for “phonetic”, enhance vocabulary retention. Pellicer-Sánchez and Perez (2024) note electronic dictionaries' portability as a driver, yet his optimism in Lexicography in the 21st Century downplays risks of over-reliance, such as students bypassing grammar analysis for quick translations. Malmkjær and Sakamoto (2022) critiques AI tools like Google Translate, praising their adaptability but warning of inaccuracies, like misrendering cultural idioms, a concern Osborne (2010) and O'Hagan (2009) underplay in their technical focus on computer-aided translation.

This literature pits print defenders (Atkins & Rundell, 2008; Karl & James, 2013) against digital advocates (Lew, 2024; Rundell, 2015), with gaps in non-Western bilingual contexts. This study bridges these with survey data from English-majored students, enriching the discourse.

3. Challenges of Paper-Based Bilingual Dictionaries

The primary challenges of paper-based bilingual dictionaries include slow lookup speed (91.9%, n=126) and bulkiness (89.8%, n=123), reflecting their physical limitations (see Figure 1). These findings emerge from a survey of 137 English-majored students, of these respondents, 60.6% rarely or never use paper-based dictionaries, underscoring a shift toward digital alternatives driven by these practical drawbacks (see Figure 2).

Figure 1. Reported Challenges of Paper-Based Bilingual Dictionaries

3.1. Limited Updates & Outdated Content

One of the most critical limitations of paper-based bilingual dictionaries is their inability to incorporate new vocabulary or evolving meanings in a timely manner. Unlike digital platforms, which can update content instantaneously, print dictionaries require new editions, a process that is both time-consuming and expensive. The survey reveals that 59.1% of respondents (n=81) identified outdated content as a significant drawback, reflecting the reality that terms such as “selfie,” “cryptocurrency,” “blockchain,” or region-specific slang often emerge and gain traction long before they appear in print. This static nature is particularly problematic in bilingual contexts where languages evolve rapidly due to cultural exchange or technological innovation. For instance, a Vietnamese-English dictionary published in 2020 might lack recent tech-related terms increasingly relevant to young learners, rendering it less useful for contemporary needs.

3.2. Portability and Accessibility Issues

The physical form of paper dictionaries presents a formidable barrier to their practicality. A striking 89.8% of survey respondents (n=123) cited bulkiness and difficulty in carrying as a primary challenge, underscoring a stark contrast with the portability of digital tools accessible via smartphones or laptops. A printed bilingual dictionary, often spanning hundreds or thousands of pages to cover two languages comprehensively, is ill-suited for on-the-go use, a critical consideration for students, travelers, or professionals who require linguistic support in diverse settings (Tono, 2011). This limitation is compounded by the fact that digital alternatives reside in the cloud or on compact devices, offering instant access without the spatial constraints imposed by physical volumes.

3.3. Lack of Interactive Features

Modern language learners increasingly expect tools that cater to diverse learning styles, a demand that paper dictionaries struggle to meet due to their lack of interactivity. The survey found that 73.0% of respondents (n=100) lamented the absence of audio pronunciation guides, a feature now standard in digital platforms like Duolingo or Google Translate. Similarly, 48.9% (n=67) noted the lack of contextual examples, which are vital for understanding nuanced usage across languages, particularly in bilingual settings where idiomatic expressions or cultural context play a significant role. Print dictionaries, confined to text alone, cannot offer searchable databases, multimedia support, or

interactive exercises, leaving them at a disadvantage compared to digital tools that enhance engagement and comprehension through dynamic features.

3.4. Space and Cost Concerns

The production and ownership of paper-based bilingual dictionaries also entail significant logistical and economic challenges. Approximately 48.2% of respondents (n=66) highlighted the higher cost of print dictionaries compared to free or low-cost digital alternatives, a concern that reflects the expenses of paper, printing, and distribution passed on to consumers. Beyond individual cost, institutions such as libraries and schools face storage burdens, as bulky volumes require shelf space that could be repurposed in an era of digital archives. These spatial and financial drawbacks are particularly acute in resource-constrained environments, where digital solutions, often available at no cost or through subscription models, provide a more scalable and economical option.

In brief, the challenges of paper-based bilingual dictionaries, outdated content, limited portability, lack of interactivity, and high space and cost demands, highlight their diminishing practicality in the digital age. Survey respondents overwhelmingly identified these issues as barriers to effective use, with 60.6% rarely or never relying on print dictionaries compared to 75.9% who use digital tools daily or weekly. These findings echo broader trends in lexicography, where the static, physical nature of print struggles to keep pace with the dynamic, accessible, and feature-rich landscape of digital technology.

4. Impact of Digital Technology

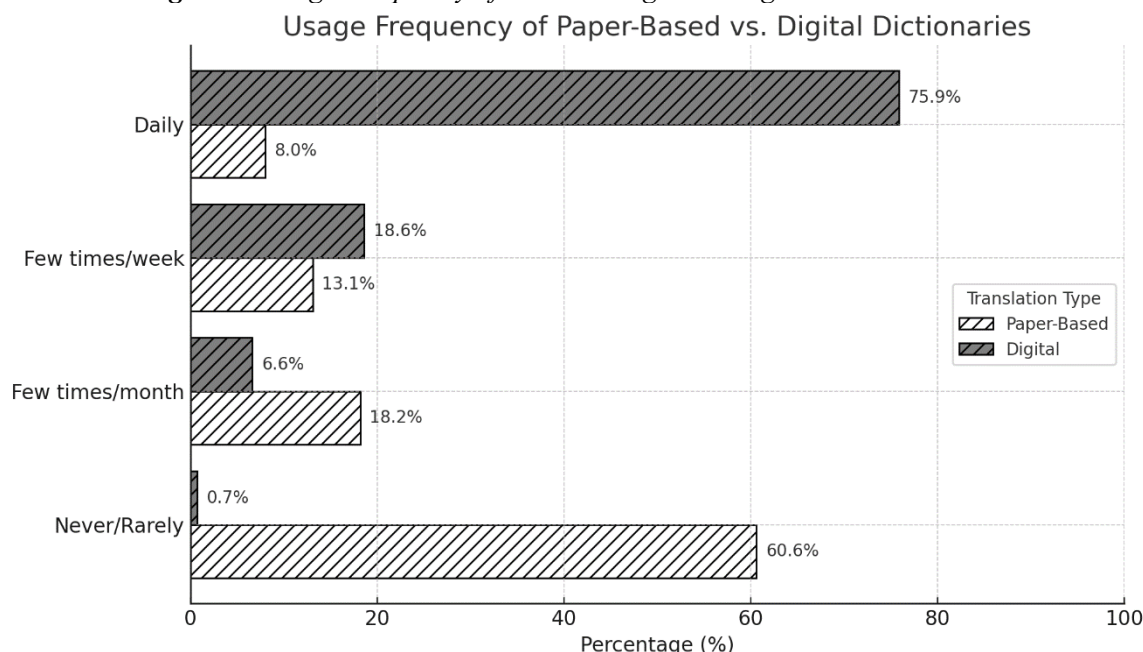
Digital technology has fundamentally transformed bilingual lexicography, offering unprecedented advantages over traditional paper-based dictionaries and reshaping how users engage with linguistic resources. This section explores the benefits of digital and online dictionaries, evolving user preferences, and the growing influence of artificial intelligence (AI) and machine translation, drawing on empirical data from a survey of 137 language learners, most aged 18-25 and 26-35 and scholarly insights.

4.1. Advantages of Digital and Online Dictionaries

Digital and online dictionaries provide a range of functional benefits that surpass the capabilities of their printed counterparts. Nesi (2009) highlights their capacity for instant updates, expansive databases, and multimedia integration. Unlike print dictionaries, which require new editions to reflect linguistic changes, digital platforms can incorporate neologisms or regional variations in real time (Lew, 2024). The survey supports this, with 91.9% of respondents (n=126) citing rapid lookup as a key advantage of digital tools, alongside 73.0% (n=100) appreciating audio pronunciation features, elements absent in static print formats. Additionally, digital tools offer cross-referencing and contextual examples, enhancing comprehension for bilingual learners. For instance, a Vietnamese-English learner can access synonym suggestions or usage notes instantly, a flexibility that Atkins and Rundell (2008) praise as a cost-effective alternative to print's labor-intensive revisions. However, this optimism assumes consistent quality across platforms, a variability that some digital dictionaries fail to address.

4.2. User Preferences and Changing Habits

The shift toward digital tools reflects a broader change in user habits, particularly among younger, tech-savvy generations. The survey reveals that 75.9% of respondents use digital dictionaries or AI tools daily, with 42.3% having fully abandoned print, while 48.2% primarily rely on digital options (see Figure 1). This aligns with findings by Laufer and Hill (2000), who found that learners favor digital dictionaries for their portability and multimedia support. Among respondents, 51.8% cite mandatory academic requirements as a reason for print use. Tono (2011) contextualizes this trend, noting that electronic dictionaries cater to on-the-go needs, a critical factor for students or professionals. Yet, Tono's analysis overlooks potential over-reliance on digital tools, which may reduce deep lexical engagement, a critique this study mitigates by highlighting print's niche use (e.g., 54.6% of 18–25-year-olds cite mandatory academic requirements).

Figure 2. *Usage Frequency of Print vs. Digital Bilingual Dictionaries*

4.3. The Role of AI and Machine Translation

AI and machine translation have further accelerated the digital transformation of bilingual lexicography, offering capabilities that extend beyond traditional dictionary functions. Malmkjær and Sakamoto (2022) examine this shift, arguing that tools like Google Translate and DeepL leverage neural networks to provide context-aware translations, often outperforming static lexical entries. In the survey, 42.3% of respondents ($n=58$) fully switched to digital tools, including AI-driven options, with features like translation suggestions enhancing adaptability and accuracy over time. For example, a Vietnamese phrase translated into English via Google Translate can account for idiomatic nuances, a sophistication print cannot replicate. The authors discussed how AI's data-driven approach enhances bilingual communication (Zaki & Ahmed, 2024). However, others caution that AI can produce errors or lack cultural sensitivity (Tenzer et al., 2024), a limitation not fully addressed in Osborne's (2011) technical focus. MacDonald (2024) further argue that while AI is effective for basic translations, it often struggles with nuanced linguistic and cultural elements, reinforcing concerns over AI's ability to replace human translators.

In brief, digital technology has redefined bilingual dictionary use through superior functionality, shifting user preferences, and AI-driven innovation. Survey data underscores this impact, with 92.7% of respondents ($n=127$) embracing digital tools for their speed and features, while scholarly research highlights both their transformative potential and lingering challenges. As digital solutions continue to evolve, they increasingly overshadow print, though not without raising questions about dependency and precision that future lexicography must address.

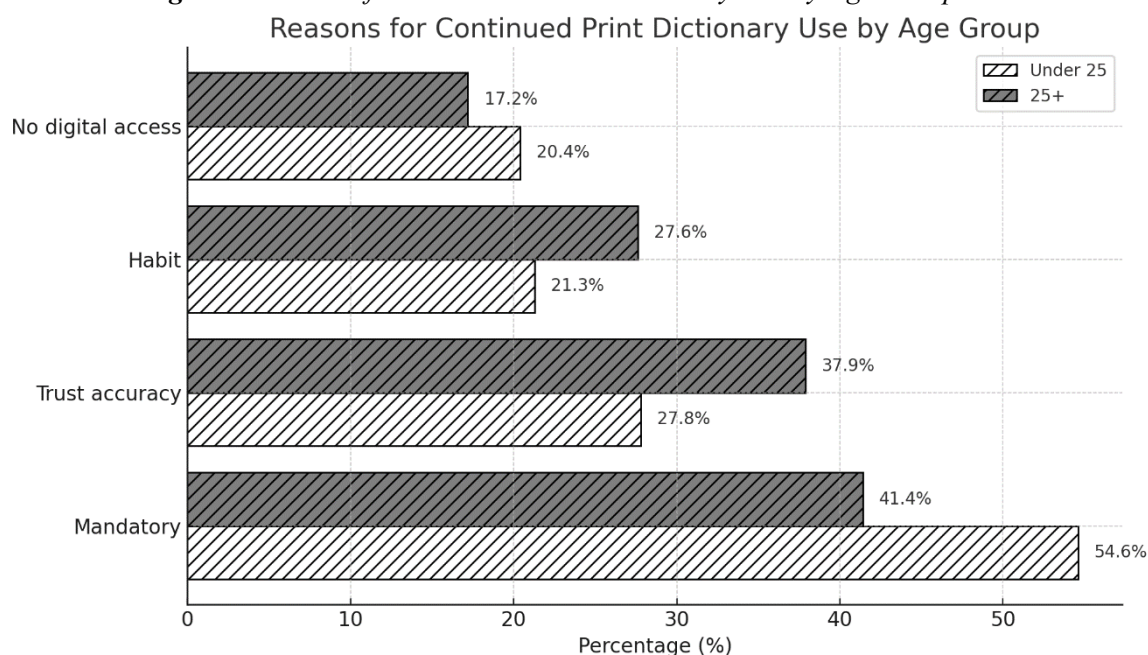
5. Future Perspectives

As digital technology continues to dominate bilingual lexicography, the future of paper-based dictionaries hinges on their ability to adapt rather than compete outright with digital alternatives. Drawing on survey data from 137 participants, alongside scholarly insights, this section explores hybrid approaches and integrative technologies as potential pathways forward. These strategies aim to balance print's legacy with digital innovation, addressing the diverse needs of younger digital natives and older learners with academic ties.

5.1. The Role of Hybrid Approaches

Hybrid approaches, blending physical and digital elements, offer a promising avenue for revitalizing paper-based bilingual dictionaries. The survey reveals a divided outlook: 42.3% of respondents (n=58) predict print's decline, 8.0% (n=11) believe it will retain a niche role, and 8.0% (n=11) use both equally, suggesting openness to innovative solutions. De Schryver (2003) advocates for hybrid models, proposing that print dictionaries could incorporate QR codes or companion apps linking to updated digital content. For instance, a Vietnamese-English print dictionary might feature scannable codes directing users to audio pronunciations of “âm tiết” (syllable) or real-time updates for terms like “sành điệu” (stylish), preserving the tactile appeal of print while overcoming its static limitations. Atkins and Rundell (2008) note that publishers have piloted such hybrid formats, though he cautions that success depends on seamless integration and widespread user adoption, challenges evident in educational contexts where technology access varies. Among the 137 respondents, 51.8% (n=71) cite mandatory academic use, a figure driven more by undergraduates (54.6%, n=59) than TESOL MA students (41.4%, n=12), who instead value print's perceived accuracy (37.9%, n=11) for teaching curricula (see Figure 3). Undergraduates, however, show greater reliance on digital tools (92.6% daily or weekly use, n=100), suggesting openness to hybrid solutions for coursework like translation exercises. This generational split suggests hybrid approaches could cater to both: offering undergraduates digital efficiency and TESOL students a familiar yet enhanced print experience.

Figure 3. Reasons for Continued Print Dictionary Use by Age Group



5.2. Potential for Integration

Technological integration, such as digital scanning and AI enhancement, further expands the possibilities for bilingual dictionaries, bridging print's depth with digital dynamism. Digital scanning technologies, like optical character recognition (OCR), can transform legacy print dictionaries into searchable digital archives, preserving their comprehensive lexical data while enhancing accessibility. Kilgarrieff et al. (2004) underscores the role of digital tools in advancing lexicography, supporting applications like digitizing dictionaries, a model applicable to bilingual resources like Vietnamese-English texts, such as converting a classic edition listing context into an interactive database (Kilgarrieff et al., 2014). Meanwhile, AI-enhanced dictionaries provide personalized,

dynamic features, such as adaptive vocabulary suggestions or context-aware translations, building on print's foundational accuracy. MacDonald (2024) praises AI's capacity to refine lexical resources, though she warns of over-reliance on automated systems that may miss cultural nuances, like the proverb's implication of quick mastery. The survey reflects this potential: 8.3% of respondents (n=11) value AI-driven translation suggestions, likely undergraduates seeking rapid solutions, while 37.9% of TESOL students (n=11) trust print's reliability. For example, an AI-enhanced Vietnamese-English dictionary could digitize a traditional print edition, adding real-time updates for technology and audio support for pronunciation, tailored to undergraduates' mobile needs and TESOL students' pedagogical precision. This synergy could ensure print's relevance across diverse learner profiles.

In summary, the future of paper-based bilingual dictionaries lies in adaptive strategies that leverage hybridity and integration. The 137 respondents highlight a spectrum of preferences: undergraduates push for full digitalization to support fast-paced learning, while MA TESOL students sustain print's niche in structured academic settings (Tono, 2011). Hybrid models address both by enhancing print with digital access, and AI-driven integration offers a modernized resource that retains print's depth, ensuring lexicography evolves to meet the needs of English-majored students and educators alike.

5.3. Limitations

While this study provides valuable insights into the challenges and preferences surrounding bilingual dictionaries among English-majored students, several limitations must be acknowledged. First, the sample size of 137 participants (108 undergraduates and 29 MA TESOL students from two Vietnamese universities) offers a focused but modest dataset. The small number of TESOL learners limits the statistical robustness of generational comparisons. A larger and more diverse sample could enhance the reliability of these findings. Second, reliance on self-reported survey data introduces potential bias, as respondents' perceptions of challenges (e.g., 89.8% citing bulkiness) may not fully reflect actual usage behaviors, which could be better assessed through observational or longitudinal methods. Third, the study's focus on English-Vietnamese bilingual contexts within Vietnam restricts its generalizability to other linguistic or educational settings, where digital adoption or print preferences might differ. Finally, conducted on March 12-15, 2025, this research captures a specific moment in technological evolution; ongoing advancements in AI-driven tools could rapidly alter the trends observed. These constraints suggest caution in extrapolating the findings and highlight opportunities for future research to address broader populations, objective usage metrics, and evolving digital landscapes.

6. Conclusion

Despite the limitations outlined in Section 5.3, this study, encompassing 137 participants, 108 third-year English-majored undergraduates from the Hanoi University of Science and Technology and 29 TESOL master's students from Hanoi University, illuminates the diminishing role of paper-based bilingual dictionaries amidst digital advancements. Survey findings indicate that 60.6% of respondents rarely or never use print dictionaries, attributing this to their static content and physical bulk, while 75.9.0% prefer digital or AI-driven tools for their convenience and interactivity (Atkins & Rundell, 2008; Laufer & Hill, 2000). These preferences reveal distinct generational patterns: younger undergraduates overwhelmingly reject print's impracticality, whereas older TESOL students sustain its niche, with 51.8% citing mandatory academic use and 37.9% valuing its perceived accuracy (see Figure 3), a divergence consistent with broader trends in electronic dictionary adoption (Pellicer-Sánchez & Perez, 2024).

Addressing the research aims, this investigation confirms the primary limitations of print dictionaries, namely, their inability to adapt to evolving lexical needs and user expectations, as critical barriers in the digital era. It further demonstrates that digital tools significantly shape usage habits, shifting reliance toward dynamic, accessible platforms among English-majored learners.

Regarding future roles, the study highlights the potential of hybrid approaches and technological integration, such as QR code-enhanced print editions (De Schryver, 2003) and AI-augmented digitization (Bowker, 2002; Kilgariff et al., 2004), to revitalize bilingual lexicography. These innovations could, for instance, modernize a Vietnamese-English dictionary with real-time updates and multimedia features, balancing print's historical depth with digital adaptability. By integrating empirical data from a non-Western bilingual context with lexicographic scholarship, this research bridges a notable gap in the literature, offering actionable insights for educators, lexicographers, and technology developers to ensure the continued evolution and relevance of bilingual dictionaries across diverse learner populations.

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**Thách thức đối với từ điển song ngữ in giấy trong kỷ nguyên số:
nghiên cứu trường hợp sinh viên chuyên tiếng Anh tại hai trường đại học**

Tóm tắt: Trong thời đại kỹ thuật số, từ điển song ngữ in giấy ngày càng trở nên lỗi thời do sự phát triển mạnh mẽ của công nghệ. Nghiên cứu này đánh giá những hạn chế của từ điển truyền thống trong bối cảnh các lựa chọn thay thế kỹ thuật số ngày càng trở nên phổ biến. Khảo sát 137 sinh viên chuyên ngành tiếng Anh cho thấy 60,6% hiếm khi hoặc không bao giờ sử dụng từ điển giấy, với lý do tra cứu chậm (91,9%) và cồng kềnh (89,8%), trong khi 75,9% sử dụng các công cụ từ điển số hàng ngày. Trong khảo sát, nhóm sinh viên đại học dẫn đầu xu hướng chuyển sang kỹ thuật số, trong khi học viên cao học TESOL vẫn duy trì sử dụng từ điển giấy vì nhu cầu học thuật và tin tưởng vào độ chính xác. Khi từ điển kỹ thuật số, ứng dụng di động và công cụ trí tuệ nhân tạo ngày càng phát triển, xu hướng sử dụng của người học cũng dịch chuyển khỏi việc dùng từ điển in giấy. Nghiên cứu này phân tích những xu hướng đó, cùng nhu cầu của người học, và tương lai của ngành từ điển học, đồng thời chỉ ra rằng mặc dù từ điển giấy vẫn có giá trị trong một số trường hợp nhất định, khả năng sử dụng của nó đang bị thu hẹp đáng kể trong kỷ nguyên mà truy cập thông tin là tức thời.

Từ khoá: từ điển song ngữ; công nghệ số; sinh viên chuyên tiếng Anh; in giấy và kỹ thuật số; từ điển học.