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E-BOOK USE AND LEARNING EXPERIENCES IN UNIVERSITY SPANISH EDUCATION IN CHINA: A QUANTITATIVE STUDY

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ABSTRACT

This study investigates the pedagogical integration of e-books into Spanish as a Foreign Language (SFL) education within Chinese universities. Drawing on data from 200 undergraduate Spanish majors, it examines the relationship between digital reading practices and perceived academic development. Quantitative analyses – including MANOVA and logistic regression – were employed to identify correlations between usage patterns and perceived outcomes in reading comprehension, vocabulary acquisition, and learner autonomy. Findings reveal that e-books serve primarily as supplementary tools for self-directed learning, valued for accessibility yet hindered by digital distraction and screen-based fatigue. Results indicate a non-linear relationship between usage: specific engagement patterns significantly correlate with perceived reading comprehension, while no significant effects were observed for vocabulary development. These findings suggest that the efficacy of e-books is determined not by the intensity of use, but by how digital practices are contextually embedded within the learning process. Ultimately, the study challenges the assumption that increased digital exposure automatically enhances linguistic proficiency, emphasizing the need for structured digital pedagogy in foreign language curricula.

KEYWORDS: E-books; Digital Reading Practices; University Language Education; Spanish as a Foreign Language; Learning Contexts.

1. INTRODUCTION

The digitalization of higher education has accelerated the adoption of digital learning resources in university teaching and learning (Cordón García, 2011; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2023). Research suggests that such resources are often associated with flexible and personalized learning environments and may influence instructional practices over time (Ashraf et al., 2021; Kümmel et al., 2020; Salmon, 2005). Within this context, e-books have attracted growing scholarly attention due to their accessibility, portability, and capacity to integrate multiple resources within a single digital platform (Carreiro, 2010; Gorski, 2010; Vassiliou & Rowley, 2008). In foreign language education, e-books are commonly used to extend learning beyond classroom settings and to support self-directed learning in digitally mediated environments (Dong & Liu, 2024).

Despite these advantages, previous research has offered mixed evaluations of the pedagogical value of e-books (Kaygısız, 2025). While digital reading resources may facilitate access to learning materials and individualized study, research has also identified challenges associated with screen-based reading, including distraction, cognitive overload, and reduced depth of processing during prolonged reading activities (Baron, 2015; Delgado et al., 2018; Mangen et al., 2013). These findings indicate that the educational significance of e-books depends not merely on technological affordances, but on how digital reading practices are embedded within specific learning contexts.

In the context of Spanish as a Foreign Language (SFL) education in China, the integration of digital learning resources presents both opportunities and constraints (Jiménez Narbona, 2019). Compared with English, Spanish has a relatively shorter history in Chinese higher education, and access to updated and authentic learning materials remains limited, particularly in legally accessible formats (Acción Cultural Española [AC/E], 2023; Chen et al., 2023; Lei & Qin, 2022). Consequently, e-books are frequently adopted as supplementary learning resources to compensate for limited material availability and to support independent learning, especially where exposure to Spanish outside the classroom is restricted.

Although the use of e-books in higher education has expanded, empirical research examining their pedagogical role in SFL contexts remains limited (Sánchez-Gutiérrez, 2022). Existing studies have largely focused on general education or English as a

Foreign Language (EFL), with relatively few investigations addressing Spanish in non-Western educational settings (Chou, 2014). Moreover, much of the literature relies on small-scale or descriptive approaches, restricting the availability of large-sample quantitative evidence on the relationship between e-book use and learning processes in foreign language education (Golonka et al., 2014).

To address these gaps, this quantitative study investigates e-book usage among 200 Chinese university students learning SFL. By analyzing questionnaire data from two universities, the research explores usage patterns and learner perceptions. Specifically, it examines how these factors relate to perceived learning outcomes—including reading comprehension, vocabulary retention, and learner autonomy—to address the following research questions: RQ1. What are the characteristic patterns of SFL e-book use? RQ2. How do learners perceive e-books as learning resources? RQ3. Beyond usage intensity, how do patterns and contexts of use relate to perceived linguistic gains?

2. LITERATURE REVIEW

2.1. E-Books In Educational Contexts

E-books have been widely discussed in educational research as a digital alternative to traditional printed materials, particularly in the context of higher education (Amirtharaj et al., 2023; Casselden & Pears, 2019). Early definitions conceptualized e-books primarily as digitized versions of printed texts accessible through electronic devices (Hawkins, 2000). With advances in digital technology, however, e-books have evolved into multifunctional learning resources that integrate multimedia elements, hyperlinks, annotation tools, and interactive features, thereby extending their pedagogical potential beyond simple text reproduction (Carreiro, 2010; EDUCAUSE Learning Initiative, 2006; Vassiliou & Rowley, 2008).

Empirical research across educational disciplines indicates that e-books may facilitate learning by improving access to instructional materials and supporting flexible learning practices (Mohd Dahlan et al., 2024). Research has shown that students often value e-books for their portability, ease of access, and search functionality, which allow them to engage with learning materials more efficiently and independently (Romero Otero et al., 2013; Zhang et al., 2021). E-book usage experience is closely shaped by the choice of reading devices and file formats. Previous studies have found that academic users primarily access e-books online via computers (Abdullah & Gibb, 2008; Levine-Clark, 2006, 2007).

Reychav et al.'s (2015) work, along with related studies, report that a large proportion of college students use mobile devices for a variety of academic activities, such as accessing e-books, journals, and library catalogues, indicating broad adoption of smartphones, laptops, tablets, and similar devices in academic contexts. In digitally mediated learning environments, e-books have also been associated with increased learner motivation and engagement, particularly when multimedia and interactive elements are pedagogically aligned with learning objectives (Sung et al., 2019).

Nevertheless, the educational effectiveness of e-books remains contested, as screen-based reading has been associated with cognitive and behavioral challenges such as distraction, cognitive overload, and reduced depth of processing, particularly during extended reading sessions (Baron, 2015; Delgado et al., 2018; Mangen et al., 2013). Such findings indicate that the pedagogical value of e-books depends not only on their technological affordances, but also on how they are pedagogically designed and integrated into specific instructional contexts and learning tasks.

2.2. Digital Reading, Reading Comprehension, And Vocabulary Learning

Research on language learning processes has increasingly examined e-books as tools to enhance exposure to authentic input and support the development of multiple language skills (Listanto et al., 2025; Zhang et al., 2020). In particular, studies in second language acquisition suggest that e-books can facilitate vocabulary development and reading comprehension (Abraham, 2008; Chun & Plass, 1996).

Reading comprehension plays a central role in foreign language learning, and the shift from print-based to digital reading has prompted extensive scholarly discussion (Ross, 2017). Research comparing digital and print reading has yielded inconsistent findings, with some studies suggesting that digital reading environments may support comprehension by enabling rapid navigation, keyword searches, and personalized reading strategies (Liu, 2012). These features can be particularly beneficial for language learners, who often rely on frequent reference and selective reading strategies when processing foreign language texts (Liu, 2005).

In contrast, other studies report that digital reading may negatively affect comprehension, particularly for longer or more complex texts. Screen-based reading has been linked to fragmented attention and surface-level processing, often

characterized by task-oriented behaviors such as copying and pasting, which may limit critical thinking and hinder deep comprehension and retention (Ackerman & Lauterman, 2012; Staiger, 2012). Delgado et al. (2018), in a meta-analysis of reading comprehension studies, found that readers tended to perform better on comprehension tasks when reading printed texts compared to digital formats, especially under time constraints. Taken together, these findings indicate that digital reading may pose challenges for deep comprehension, particularly when cognitive demands are high or reading time is constrained.

Despite these concerns regarding reading comprehension, research in foreign language education suggests that digital reading resources can support other dimensions of language learning, particularly vocabulary acquisition, when used strategically (Zhu et al., 2024). Studies focusing on vocabulary learning indicate that digital texts, especially those incorporating glosses, hyperlinks, and multimedia annotations, may facilitate lexical acquisition by providing immediate access to contextualized information (Kuromiya et al., 2022). In such cases, the effectiveness of digital reading appears to be closely related to learners' reading strategies, frequency of exposure, and familiarity with digital tools rather than the medium itself.

2.3. Learner Autonomy and Digital Learning Resources

Learner autonomy has long been recognized as an important aspect of successful foreign language learning, particularly in higher education contexts where students are expected to engage in self-directed learning beyond the classroom (Najeeb, 2013). Digital learning resources, including e-books, are often viewed as supportive tools for fostering learner autonomy by enabling flexible access to materials and greater self-regulation in learning processes (Viberg & Kukulska-Hulme, 2021).

Previous research suggests that such resources may encourage autonomous learning behaviors by lowering barriers to access and supporting individualized learning pathways. In particular, they provide opportunities for extensive reading, self-review, and vocabulary reinforcement beyond formal instructional settings (Benson, 2011; Reinders & White, 2011). However, learner autonomy does not automatically emerge from access to digital resources. Previous research emphasizes that learners' perceptions, digital competence, and instructional guidance play a crucial role in determining whether digital tools effectively support

autonomous learning (Forsström et al., 2025; Zhao et al., 2021). Learner autonomy can be viewed as a dynamic construct shaped by both individual agency and contextual support. In digitally mediated environments, autonomy is closely linked to learners' ability to manage attention, select appropriate resources, and maintain sustained engagement with learning materials. Accordingly, empirical research that examines learners' actual usage patterns and perceptions of digital resources is essential for understanding how autonomy-related learning behaviors are supported in specific instructional contexts.

2.4. E-Books In Foreign Language Education and Research Gaps

Although e-books have been extensively examined in general education, research focusing specifically on foreign language education remains comparatively limited within the broader field of technology-enhanced language learning (Burston, 2015; Zhang et al., 2020). Existing studies have predominantly concentrated on EFL, with relatively few investigations addressing other languages such as Spanish, particularly in non-Western contexts (Golonka et al., 2014; Stockwell, 2013). Moreover, a considerable proportion of prior research relies on small-scale experimental or qualitative designs, which constrains the availability of evidence on large-sample usage patterns and learning outcomes (Chen et al., 2023; Li & Yan, 2024). As a result, quantitative studies systematically examining the relationship between e-book use and specific learning outcomes – such as reading comprehension, vocabulary retention, and learner autonomy – remain scarce, particularly at the university level in foreign language education (Zhang et al., 2020; Zhu et al., 2024). This methodological imbalance limits the generalizability of existing findings and underscores the need for large-scale, context-sensitive empirical research.

Within Chinese higher education, rapid digitalization has facilitated the widespread adoption of digital learning platforms and resources (Liu et al., 2019; Xiao, 2019). Nevertheless, empirical investigations into the pedagogical integration of these digital resources in foreign language instruction remain insufficient (Wang et al., 2009). In the specific case of SFL, where access to authentic learning materials can be constrained, e-books are frequently employed as supplementary learning resources (Zhen et al., 2020). However, empirical evidence on students' patterns of e-book uses and their relationship with learning outcomes in foreign

language education remains limited (Golonka et al., 2014).

Addressing these gaps, the present study adopts a quantitative approach to examine patterns of e-book use among Chinese university students learning Spanish as a foreign language and their relationship with perceived learning outcomes.

3. METHODOLOGY

3.1. Research Design

This study adopts a quantitative research design to examine patterns of e-books use among Chinese university students learning SFL. A questionnaire-based survey was employed to collect large-sample empirical data on students' demographic characteristics, e-book use behaviors, and perceptions of e-books as learning resources. In this study, e-book use refers to students' engagement with digital reading materials for both course-related and self-directed learning purposes, rather than to a specific platform or instructional intervention.

3.2. Participants

A total of 200 undergraduate students majoring in Spanish from two universities in Harbin, Heilongjiang Province, China, participated in the study, including one public and one private institution. The two universities were selected to reflect different institutional profiles within regional Spanish language education. Participants were primarily third- and fourth-year undergraduates, as they had accumulated sufficient learning experience to evaluate their use of e-books in language learning. Participation was voluntary, and all respondents were informed of the study's purpose prior to data collection. After data screening, 194 valid questionnaires were retained for analysis.

3.3. Instrument And Data Collection

Data were collected using a questionnaire developed specifically for this study, informed by previous research on e-books, digital reading, and foreign language learning (Golonka et al., 2014; Nicholas et al., 2008; Liu, 2012). The questionnaire was adapted to the instructional context of Spanish as a foreign language in Chinese higher education and consisted of four sections: (1) demographic background information, (2) e-book use experience and usage behaviors, (3) perceptions and cognitive evaluations of e-books as learning resources, and (4) preferences and intentions regarding future e-book use.

The questionnaire was administered electronically during the autumn semester of the 2024–2025 academic year using Wenjuanxing, an online survey platform widely used in academic research in China. The survey link was distributed via class-based WeChat groups. Participation was anonymous, and all responses were screened for completeness prior to analysis.

3.4. Data Analysis

All statistical analyses were conducted using R statistical software. Descriptive statistics were used to summarize participants' background characteristics and general patterns of e-book use. Inferential analyses were then performed to examine group differences and relationships among variables. Multivariate analysis of variance (MANOVA) was applied to assess differences in students' perceptions and perceived learning outcomes by institutional and usage-related factors. Logistic regression analysis was employed to examine the associations between

e-book use patterns and key perceived learning outcomes, including reading comprehension and vocabulary learning, while controlling for relevant background variables. Statistical significance was assessed at conventional thresholds.

4. RESULTS

4.1. Participant Characteristics and E-Books Use Patterns

A total of 194 valid questionnaires were included in the analysis. Female students accounted for approximately three quarters of the sample, and participants were evenly distributed between the third and fourth years of undergraduate study. Slightly more than half of the respondents were enrolled at the private university (University B), with the remainder attending the public institution (University A). Most participants reported intermediate to advanced Spanish proficiency, with the majority holding B1 or B2 levels (as shown in Table 1.).

Table 1: Distribution of Participants by University, Year of Study, And Gender (N = 194).

University	Year of study	Female (n)	Male (n)	Total (n)	%
University A	Third year	32	6	38	19.6
	Fourth year	28	12	40	20.6
	Subtotal	60	18	78	40.2
University B	Third year	41	18	59	30.4
	Fourth year	43	14	57	29.4
	Subtotal	84	32	116	59.8
Total	–	144	50	194	100

Note: Percentages Are Calculated Based on The Total Sample Size (N = 194).

With regard to prior digital reading experience, a high level of exposure to EB was reported. Nearly two thirds of the participants indicated frequent use of e-books prior to the study, while fewer than 10% reported no prior digital reading habit. Most respondents also reported moderate to high proficiency in using digital reading devices. E-books were used primarily as supplementary resources for course-related reading and for self-directed study outside the classroom. The average duration of reading sessions was relatively short, suggesting predominantly fragmented or task-oriented reading practices rather than extended continuous reading.

4.2. Learners' Perceptions of E-Books

Overall, participants expressed generally positive attitudes toward the use of e-books in learning Spanish. Descriptive statistics indicate that e-books were valued for their usability and accessibility, particularly the convenience of search functions and flexible access to learning materials (Table 2). At the same time, participants reported a moderate level of distraction during e-book use, reflecting common challenges associated with screen-based reading.

Table 2: Descriptive Statistics for Learners' Perceptions of E-Book Use.

Item	N	Mean	SD
Distraction during e-book use	194	3.18	0.71
Perceived usability of the e-book search system	194	3.95	0.81
Perceived impact of e-book on reading comprehension	194	2.96	0.94

Note: Items Were Measured on A 5-Point Likert Scale (1 = Strongly Disagree, 5 = Strongly Agree).

Perceptions regarding the equivalence of e-books and printed books were mixed. Approximately half of the respondents considered e-books comparable to printed materials in terms of usability, while the

remainder expressed reservations. In addition, a majority of participants believed that e-books influenced memory during reading, although views differed regarding whether this influence was

beneficial or limiting. Many respondents highlighted the role of e-books in supporting autonomous learning by enabling flexible access to resources, while also identifying difficulties related to sustained concentration and visual fatigue.

Multivariate analysis revealed a significant effect of gender on perceived advantages of e-books, whereas no significant differences were observed by institutional affiliation or interaction effects. In contrast, perceptions of limitations associated with e-book use did not differ significantly across gender or institutional groups, suggesting broadly shared experiences of the challenges of digital reading.

4.3. Associations Between E-Book Use and

Perceived Learning Outcomes

Ordinal logistic regression analysis revealed a non-linear relationship between e-book use intensity and perceived reading comprehension (Table 3). Compared with students reporting lower levels of extra weekly e-book use, those in the moderate-to-high usage range (12–16 hours per week) were significantly less likely to report higher levels of perceived reading comprehension. Other usage categories did not show statistically significant associations, and estimates for the highest usage group should be interpreted cautiously due to the small number of cases.

Table 3: Ordinal Logistic Regression Results for Perceived Reading Comprehension.

Predictor (reference category)	OR	95% CI	p
Weekly extra Spanish study outside class (< 8 h)			
8–12 h	0.699	0.355–1.379	.302
12–16 h	0.306	0.116–0.803	.016*
16–20 h	1.993	0.327–12.149	.454
> 20 h	3.639	0.498–26.598	.203
University affiliation (control)	–	–	> .05
Gender (control)	–	–	> .05

Note: OR = Odds Ratio; CI = Confidence Interval.

The reference category for weekly extra Spanish study time is < 8 hours. University affiliation and gender were included as control variables. Additional usage-related variables, perceived advantages, and drivers of e-book use were included in the model but did not reach statistical significance. $p < .05$.

In contrast, binary logistic regression analysis did

not identify any statistically significant predictors of perceived vocabulary memory (Table 4). Neither usage intensity nor demographic variables such as gender and institutional affiliation were associated with differences in perceived vocabulary retention. Although a downward tendency was observed in the highest usage categories, these effects did not reach statistical significance.

Table 4: Binary Logistic Regression Results for Perceived Vocabulary Memory.

Predictor (reference category)	OR	95% CI	p
University affiliation (University A)			
University B	1.039	0.505–2.140	.917
Gender (female)			
Male	1.170	0.529–2.586	.698
Weekly extra Spanish study outside class (< 8 h)			
8–12 h	0.618	0.272–1.404	.250
12–16 h	0.946	0.284–3.156	.928
16–20 h	0.271	0.050–1.468	.130
> 20 h	0.247	0.026–2.305	.220

Note: OR = Odds Ratio; CI = Confidence Interval.

Binary logistic regression was conducted with perceived vocabulary memory as the dependent variable. University affiliation and gender were included as control variables. Additional usage-related variables, perceived advantages, and drivers of e-book use were included in the model but did not reach statistical significance and are therefore not shown.

4.4. Summary of Key Findings

In summary, the results show that e-books are

widely adopted as supplementary learning resources in university-level Spanish education and are generally perceived as convenient and supportive of autonomous learning. However, increased usage intensity does not correspond to uniformly positive perceptions of learning outcomes. Instead, perceived reading comprehension appears to be shaped by specific thresholds of use, while perceptions of vocabulary learning remain relatively stable across usage patterns. These findings highlight the importance of considering how e-books are used,

rather than how frequently they are used, when evaluating their pedagogical role.

5. DISCUSSION

This study examined patterns of e-book use among Chinese university students learning Spanish as a foreign language and explored how such use relates to perceived learning outcomes. Drawing on large-sample questionnaire data, the findings extend existing discussions on digital reading in higher education to the underexplored context of Spanish as a foreign language in China. Rather than portraying e-books as uniformly beneficial or detrimental, the results highlight selective and context-dependent associations between e-book use, learning practices, and perceived outcomes. In particular, the findings suggest that the pedagogical value of e-books is shaped more by patterns of engagement than by use intensity alone.

5.1. *E-Books As a Supplementary Learning Resource*

The results indicate that e-books are widely used by students primarily as a supplementary resource rather than as a substitute for printed materials. This pattern is consistent with previous research suggesting that digital and print formats tend to coexist in higher education contexts (Baron, 2021; Mizrachi et al., 2018). In the context of Spanish language education in China, where access to updated and authentic printed materials may be limited, EB appear to function as an accessible extension of classroom learning rather than a dominant instructional medium.

The predominance of short and task-oriented reading sessions suggests that students tend to use e-books for targeted learning purposes, such as reviewing course content, searching for information, and supporting self-directed study. This finding aligns with research indicating that screen-based reading is often characterized by selective and non-linear engagement rather than sustained continuous reading (Liu, 2005, 2012). While such usage patterns may support flexible learning practices, they may also help explain why increased access to e-books does not translate into uniformly positive learning outcomes.

5.2. *Learners' Perceptions of Digital Reading*

Participants reported generally positive perceptions of EB, particularly in terms of accessibility, portability, and convenience. These findings are consistent with earlier studies emphasizing the practical advantages of digital

learning resources in higher education (Sung et al., 2019; Viberg & Kukulska-Hulme, 2021). For language learners, flexible access to learning materials beyond the classroom appears to be a key factor contributing to the acceptance of e-books.

At the same time, students reported several constraints associated with digital reading, including difficulty maintaining concentration, visual fatigue, and susceptibility to distraction. These concerns echo well-documented challenges related to prolonged screen-based reading (Baron, 2015; Clinton, 2019; Mangen et al., 2013). The coexistence of perceived advantages and limitations suggests that learners' experiences with e-books are inherently ambivalent, reflecting a balance between technological affordances and cognitive constraints. Importantly, the limited role of institutional affiliation in shaping perceptions indicates that individual learning practices may play a more influential role than institutional context in determining how e-books are experienced.

5.3. *E-Book Use and Perceived Learning Outcomes*

The inferential analyses revealed a selective relationship between e-book use and perceived learning outcomes. A statistically significant association was observed between perceived reading comprehension and a specific range of weekly e-book use, whereas no consistent predictors emerged for perceived vocabulary memory. This pattern suggests that the relationship between e-book use and learning outcomes is not linear. Moderate levels of engagement may be associated with more favorable perceptions of reading comprehension, while excessive or unguided use does not appear to yield comparable benefits.

Such non-linear effects are consistent with previous research indicating that extended screen-based reading may reduce comprehension due to cognitive overload and attentional fragmentation (Delgado et al., 2018; Wolf, 2018). In contrast, the absence of significant effects for perceived vocabulary learning aligns with studies suggesting that lexical development through digital reading depends heavily on specific design features and learning strategies, such as glosses, annotations, and repeated exposure (Zhu et al., 2024). As the present study did not differentiate between types of e-books or embedded supports, variability in learners' engagement with lexical information may partly account for the lack of significant associations.

5.4. *Implications For Learner Autonomy*

The widespread use of e-books for self-directed learning activities highlights their perceived role in supporting learner autonomy. Students frequently reported using e-books outside the classroom for reviewing course content and accessing reference materials, suggesting that e-books function as readily accessible resources for independent study (Viberg & Kukulska-Hulme, 2021). However, the findings do not indicate a direct effect of e-book use on learner autonomy as a measurable learning outcome. Instead, they reflect learners' perceptions of e-books as tools that facilitate autonomy-related learning behaviors.

This distinction reinforces the view of learner autonomy as a dynamic construct shaped by both individual agency and contextual support (Najeeb, 2013). While access to e-books may lower practical barriers to independent learning by enabling flexible engagement with learning materials, such access alone does not guarantee the development of autonomous learning capacities. Pedagogical guidance and digital literacy therefore remain essential for helping learners manage distraction, regulate reading strategies, and engage purposefully with digital texts. From this perspective, the contribution of e-books to learner autonomy lies not in their technological features per se, but in how they are embedded within instructional contexts that encourage reflective and goal-oriented use.

5.5. Pedagogical Implications

The findings of this study offer several practical implications for the pedagogical integration of e-books in university-level Spanish as a Foreign Language (SFL) instruction. First, the non-linear relationship identified between e-book use intensity and perceived reading comprehension suggests that simply increasing exposure to digital reading materials does not automatically enhance learning outcomes. Instructors are therefore encouraged to emphasize structured and purpose-driven use of e-books, particularly for reading tasks that require focused comprehension rather than prolonged, unguided screen-based reading.

Second, given that students reported frequent distraction and visual fatigue during e-book use, pedagogical strategies aimed at reducing digital distraction are essential. These may include guiding students to set specific reading goals, encouraging shorter but focused reading sessions, and integrating e-book use into clearly defined learning tasks rather than open-ended browsing. Such strategies may help learners manage attention more effectively in digitally mediated reading environments.

Third, as e-books were primarily used as supplementary resources for self-directed learning, teachers may play a key role in scaffolding students' autonomous use of digital reading materials. Explicit instruction on effective digital reading strategies—such as selective annotation, controlled use of search functions, and balanced integration of print and digital materials—may enhance the pedagogical value of e-books while mitigating cognitive overload.

Overall, these findings indicate that the educational effectiveness of e-books in SFL contexts depends less on usage frequency and more on how digital reading practices are pedagogically embedded within course design. Thoughtful instructional guidance and structured integration are therefore crucial for maximizing the benefits of e-books in university Spanish language education.

6. CONCLUSION

This study examined patterns of e-book use among Chinese university students learning Spanish as a foreign language and explored how such use relates to perceived learning outcomes. Drawing on questionnaire data from undergraduate learners, the analysis focused on students' usage behaviors, perceptions of e-books, and self-reported outcomes in reading comprehension, vocabulary memory, and learner autonomy.

The findings show that EB are widely used in university-level Spanish education in China, primarily as supplementary resources rather than as replacements for printed materials. While students generally valued e-books for their accessibility, convenience, and support for self-directed learning, they also reported common challenges associated with digital reading, including distraction and screen-based fatigue. Importantly, the relationship between e-book use and perceived learning outcomes was found to be selective rather than uniformly positive. A non-linear association emerged for perceived reading comprehension within a specific range of use, whereas no significant predictors were identified for perceived vocabulary memory. In addition, e-books were perceived as facilitating autonomy-related learning activities, although no direct effect on learner autonomy as a measurable outcome was observed.

Several limitations should be acknowledged. The study relied on self-reported data, which reflect learners' perceptions rather than objectively measured performance, and the cross-sectional design limits causal interpretation. Moreover, the sample was drawn from two universities within a specific regional context, and variations in e-book

design and reading strategies were not examined. Future research may therefore benefit from longitudinal or experimental designs, the inclusion of objective learning measures, and closer attention to pedagogical practices and e-book features that shape digital reading experiences.

Overall, this study contributes empirical evidence from an underexplored instructional context and underscores the importance of context-sensitive and pedagogically grounded integration of EB in foreign language education.

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