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Linguistic Risks and Resilience in Digital Language Learning

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Abstract. Digital technologies have transformed global language education, offering new opportunities for children and students through mobile applications, online platforms, and AI-driven tools. Yet, alongside these innovations, critical linguistic risks emerge that may hinder communicative competence, equity, and linguistic diversity. This article examines such risks by conducting a thematic literature review of recent studies in applied linguistics, sociolinguistics, and digital pedagogy. Findings indicate that while digital tools support vocabulary acquisition, motivation, and learner autonomy, they often fall short in developing productive and socio-pragmatic skills. Risks include over-reliance on automated feedback, exposure to inaccurate or non-standard input, cognitive overload from distractions, inequities arising from the digital divide, and the marginalization of minority languages in digital spaces. The discussion emphasizes blended pedagogical approaches, teacher mediation, infrastructure investment, and inclusion of diverse languages as key strategies to mitigate these risks. By navigating these challenges, digital language learning landscapes can evolve into more effective, equitable, and culturally sustaining environments. This study contributes a theoretically grounded framework for understanding and addressing linguistic risks in digital education, offering insights for educators, policymakers, and developers seeking to align technological innovation with sound linguistic principles.

Keywords: digital language learning, linguistic risks, mobile-assisted language learning (MALL), communicative competence, digital divide, linguistic diversity, applied linguistics

Introduction

Digital technology has become deeply embedded in language education worldwide, creating *digital language learning landscapes* that range from mobile apps and online courses to social networks and AI-driven tutoring systems. The COVID-19 pandemic accelerated this trend; for instance, in March 2020 the popular app Duolingo reported double its usual number of sign-ups as millions sought to learn languages during lockdowns. From rural India to African classrooms, digital tools have *broadened* access to language learning. In India's community programs, a mobile app (Hello English) significantly improved basic English literacy for adults and children. Likewise, in several African countries, educators have leveraged WhatsApp to facilitate group discussions among ESL learners, *effectively fostering* collaborative learning in low-resource settings. These examples highlight the global potential

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of technology to enhance language acquisition through increased accessibility, engagement, and personalized learning.

However, alongside these promising opportunities, educators and researchers are drawing attention to a spectrum of linguistic risks inherent in digital learning environments. *Linguistic risk* in this context refers to any factor that may negatively impact language development or communication skills as a result of using digital platforms for language learning. The surge in digital language tools has outpaced the scrutiny of their educational efficacy and long-term effects. A recent meta-analysis by Mihaylova et al. (2022) found that mobile language learning apps can indeed boost second-language proficiency with a moderate-to-strong effect size ($g \approx 0.88$), yet the evidence base is marred by high bias risk and low study quality, warranting caution in interpreting those benefits. In other words, while digital platforms appear beneficial, we must critically examine how they shape language learning outcomes – especially for children and students, who are often early adopters of technology. Key concerns include whether app-based learning sufficiently develops *communicative competence*, how exposure to digital media affects young learners' language development, and if reliance on dominant languages online might erode linguistic diversity. To ensure that digital innovation truly serves language education, it is imperative to navigate these risks through informed strategies and research-based practices. This article adopts an IMRaD structure to investigate the theoretical and practical challenges ("linguistic risks") in contemporary digital language learning landscapes and to discuss how these risks can be mitigated, thereby turning potential pitfalls into pathways for more effective and equitable language education.

Methodology

This study follows a qualitative research approach, comprising a thematic literature review and conceptual analysis. We systematically collected and examined recent research (2018–2025) on digital language learning across multiple contexts to identify recurrent risk factors and recommended mitigation strategies. Academic databases (e.g. Scopus, ERIC, Google Scholar) were searched for keywords such as "digital language learning," "mobile-assisted language learning," "children language development and screen time," "language learning apps," and "linguistic diversity online." Approximately 20 peer-reviewed sources – including empirical studies, meta-analyses, and policy reports – were selected based on their relevance to *educational technology in language learning*, with a focus on global perspectives and the impact on children and student learners. Notably, we incorporated insights from researchers who have examined mobile-assisted language learning and digital pedagogy in multilingual contexts, as well as studies from various regions to ensure a broad view. Key information from each source was extracted and coded along thematic lines (pedagogical outcomes, cognitive development, equity, etc.), allowing us to triangulate findings and theory from applied linguistics, education, and sociolinguistics. No new experimental data were collected; instead, our aim was to synthesize existing evidence to map out the landscape of linguistic risks. By combining findings from controlled studies, surveys, and expert analyses, we sought to build a comprehensive framework of the challenges digital learners face. This method enables a robust, interdisciplinary understanding of how digital tools influence language learning – beneficial or detrimental – and grounds our discussion of mitigation strategies in documented research. The following sections present the results

of this literature-driven analysis, organized by major risk domains, followed by a discussion on navigating these challenges for future practice.

Results

1. Benefits with Caveats: Efficacy vs. Missing Skills

Across the literature, digital language learning tools show clear benefits in certain areas, but these come with caveats. Many studies report that mobile applications and online platforms can significantly improve specific language skills like vocabulary recognition and retention. For example, a comparative review by Alisoy and Sadigzade (2025) found that mobile-app learners often outperform traditional classroom learners in vocabulary retention and engagement, thanks to features like multimedia content, spaced repetition, and gamification. These findings align with broader evidence that students enjoy the convenience and interactivity of apps, which can increase time-on-task and motivation. Nonetheless, the same review highlighted a critical limitation: traditional instruction still excelled at fostering productive language skills, such as speaking and writing in context, due to richer interaction and teacher mediation. In fact, blended approaches (combining digital tools with face-to-face teaching) yielded the most balanced outcomes. This suggests that while apps are effective for drills and practice, they cannot alone guarantee communicative competence.

Linguists emphasize that mastering a language involves more than memorizing words and grammar rules; it requires developing the ability to use the language spontaneously in real social interactions. Piller (2021) notes that *"Language is about interacting with other people – it's not something we do alone."* An app can teach vocabulary and pronunciation exercises, but it cannot replicate the dynamic, unpredictable nature of human communication. The present analysis found widespread agreement that digital learners risk becoming *"fluent" in drills yet flustered in dialogue*. The gamified, self-paced environment of apps is a double-edged sword: on one hand, it rewards consistency and keeps learners "glued to the screen" with points and streaks, leading to steady practice habits. On the other hand, it provides a safe bubble devoid of the pressure and spontaneity of real conversations. Learners don't experience the crucial "linguistic risk-taking" of using the target language in unrehearsed, meaningful situations. A user reflection encapsulated this: achieving streaks in an app felt *"safe and therefore slightly empty"* compared to the vulnerable thrill of real-life interactions, where one must risk making mistakes to communicate. In summary, overreliance on digital platforms may leave a gap in pragmatic and conversational skills, meaning learners might score well on app-based tests but struggle to improvise in actual communication.

2. Quality of Input and Feedback: Accuracy vs. Automation

Another identified risk area is the quality and authenticity of linguistic input and feedback that learners receive in digital environments. Traditional learning often involves expert teachers who can provide nuanced corrections and adapt to learners' needs. In contrast, many digital platforms rely on automated feedback and user-generated content, which can vary widely in accuracy. The rise of AI-powered writing assistants and chatbots in language learning illustrates this tension. Such tools (e.g. Grammarly or ChatGPT-based tutors) offer immediate, detailed corrections on grammar and usage,

potentially accelerating writing development by providing on-demand help. Yet, as Sadigzade (2025) points out, *these AI tools also come with distinct risks*: students may become over-reliant on AI suggestions, accepting corrections uncritically and thus failing to develop their own self-editing skills. Moreover, the feedback quality can be inconsistent, since AI may misjudge context or appropriateness even as it excels at surface-level fixes. There are documented concerns about privacy and academic integrity as well – for example, uploading student essays to cloud-based services raises data privacy issues, and using AI hints can blur the line between learning and cheating if not properly guided.

Similar concerns apply to the linguistic input learners encounter on digital platforms. Unlike curated textbooks, the internet exposes learners to a vast array of language uses, including slang, informal shorthand, and outright errors. Social media and language exchange apps vividly demonstrate this mix of rich input and potential misinformation. A comprehensive analysis by Nuri (2024) on social networking in language acquisition found that these platforms provide *"deeply authentic input and social interaction"* which can bolster cultural competence and real-world vocabulary. At the same time, it identified critical challenges: learners are frequently exposed to non-standard language forms (e.g. internet slang, regional dialect spellings) and face endless digital distractions that can derail focused learning. In uncontrolled online environments, a learner might pick up incorrect grammar from a casual YouTube comment or get sidetracked by unrelated content. Without guidance, distinguishing acceptable informal usage from errors can be difficult for students. Thus, the pedagogical quality control that a teacher or curriculum provides may be lacking in open digital spaces. Taken together, the literature suggests a risk of "garbage in, garbage out": if learners absorb faulty input or depend on imperfect automated feedback, their language development might include fossilized mistakes or stylistic issues that are hard to unlearn.

3. Cognitive Load and Distraction: The Attention Challenge

Digital language learning occurs on the same devices and platforms that deliver a myriad of other content, posing a constant competition for learners' attention. One prominent risk identified is that of distraction and cognitive overload in digital environments, especially for children and teenage students who may struggle with self-regulation. Unlike a physical classroom with a teacher enforcing focus, a student using a language app on a tablet can easily toggle to games, social media, or other apps. Even within educational software, the multimedia elements intended to engage learners can sometimes overwhelm them with stimuli, reducing the quality of learning. Alisoy et al. (2024) conducted a survey of 540 students on smartphone use for education and found an interesting duality: students overwhelmingly *"recognize the value of smartphones"* for enhancing language learning through on-demand practice and resources, yet they also report that these devices introduce serious distractions that can derail study sessions. Notifications, multitasking, and the habit of short attention spans, all common in youth accustomed to smartphones, can interrupt the deep focus needed for mastering a language's complexities.

For younger children in particular, *excessive screen time* has been associated with adverse effects on language development. A recent review concluded that increasing the amount of screen exposure at an early age has measurable negative impacts on children's language outcomes. Children under two or

three years old, who learn best through responsive interaction with caregivers, do not benefit from passive screen-based learning to the same extent. Studies have linked unmonitored, high-dose media use in infancy with delayed speech and smaller vocabularies (Karani et al., 2022; Raheem et al., 2023 as cited in various reports). While educational programs can mitigate these effects if content is high-quality and used interactively, the consensus is that screen-based learning should be introduced judiciously for young learners. Even for older children, cognitive psychologists note that digital multitasking can impede the formation of long-term memory. The allure of interactive apps might keep students busy, but if they are *splitting attention* between the lesson and other online temptations, the depth of language processing may suffer. In sum, the digital medium itself poses a risk: without structures to maintain focus, the efficacy of language learning can decline due to fragmented attention and mental overload.

4. Equity and Access: The Digital Divide in Language Learning

A recurring theme in the literature is the socioeconomic disparity in who can fully benefit from digital language tools. Often termed the *"digital divide,"* this refers to gaps in access to reliable internet, up-to-date devices, and supportive learning environments outside school. Digital learning opportunities tend to favor students who have constant connectivity, modern gadgets, and digitally literate support networks – typically those in wealthier or urban settings. Conversely, students in low-resource contexts risk falling further behind. As one analysis succinctly put it, despite its promise, *"mobile-assisted language learning (MALL) faces significant challenges, including technical limitations like device compatibility and internet access"*. In some regions, basic infrastructure is lacking: irregular electricity or slow networks make it difficult to maintain daily app routines or video tutoring sessions. Even within a single classroom, not all children may own a personal device for practice, or they may have to share with siblings, limiting their time on task.

Additionally, lack of teacher training in digital pedagogy can exacerbate inequities. If educators are not well-versed in integrating apps or online resources into their curriculum, students effectively lose out on the blended approach that maximizes success. Alisoy and Sadiqzade (2024) emphasize pedagogical concerns like *content quality and teacher training* as major hurdles in digital language education. Some teachers may avoid using potentially valuable tools due to unfamiliarity, while others might use them inappropriately (for example, relying on translation apps in class without guidance). This inconsistency can lead to unequal learning experiences across schools. There are also economic disparities where premium platforms or ad-free versions of apps cost money. Students from affluent families can afford subscriptions that unlock more content, while disadvantaged students are left with limited, advertisement-supported versions or no access at all – a clear equity issue. Thus, without deliberate intervention, digital language learning can inadvertently widen educational gaps, rewarding those already privileged with more resources.

5. Linguistic Diversity at Risk: Dominance of Major Languages

An often-overlooked risk in the push for digital language learning is its potential impact on *linguistic diversity*. The internet and popular apps predominantly cater to a handful of global languages (English, Spanish, Mandarin, etc.), which means learners worldwide are incentivized to focus on those languages

at the expense of local or minority languages. UNESCO has warned that many languages could disappear under the pressure of dominant global tongues. A European Parliament briefing (Pasikowska-Schnass, 2020) explicitly noted that this threat is "exacerbated by digital technology." Young people now communicate and consume media primarily online, so *"if online content is only available in dominant languages, lesser-used languages could become 'digitally extinct'."* In other words, when children in a multilingual society find that all the exciting apps, games, and videos are in English, they may gradually disengage from their mother tongue, not seeing it as part of modern life. Over time, this can lead to declining fluency in heritage languages and even intergenerational language loss.

Furthermore, even for widely spoken languages with multiple dialects, digital platforms often adopt a one-size-fits-all standard (typically the prestige or Western variety). Learners might not be exposed to regional varieties or registers appropriate to different contexts, potentially leading to a homogenization of language use. For example, a student in West Africa learning French through an app might only hear Metropolitan French accents and vocabulary, or an indigenous language speaker in Latin America might switch to using Spanish online for lack of digital resources in their language. The risk here is cultural: the rich diversity of linguistic practices could be eroded as *global learners gravitate towards the languages and norms best supported by technology*. However, it's important to acknowledge that technology can also be a tool for preservation if applied thoughtfully. The same EU report suggests that online education and language technologies can help revitalize endangered languages – but only if communities invest effort in creating digital content for those tongues. In the absence of such efforts, the default trajectory of digital language learning ecosystems tends to sideline minority languages, putting them at further risk.

Discussion

This review has unveiled a complex interplay of advantages and risks in digital language learning landscapes. On one side, technology offers unprecedented opportunities: on-demand practice, engaging multimedia, personalized feedback, and global connectivity for learners. On the other side, we see that without careful implementation, these very features can become pitfalls – yielding shallow learning, fostering dependency, or exacerbating inequalities. How can educators, parents, and policymakers navigate these linguistic risks to harness the positive power of digital tools while safeguarding against their downsides? In this discussion, we integrate theoretical insights and practical recommendations from the literature to suggest ways forward in creating a balanced and resilient digital language learning environment.

1. Blending Digital and Human Interaction: A clear consensus is that digital tools should *supplement, not replace*, human-mediated learning. The social and communicative gaps identified (such as lack of real conversation practice) can be addressed by deliberately pairing technology use with interactive opportunities. For example, teachers might use an app for vocabulary drills but then conduct live group activities (in-person or via video call) for students to use those new words in context. This aligns with Alisoy and Sadigzade's (2025) finding that a blended approach yielded the best outcomes, combining apps' efficiency with the teacher's guidance for productive skills. Educators should encourage "linguistic risk-taking" in safe settings – such as classroom discussions, language exchange

sessions, or even voice notes in a class chat group – so that students build the confidence to communicate spontaneously. Theoretical work by Pérez-Paredes and Zhang (2022) supports this shift, arguing that the field must move away from *device-centered pedagogies* toward socially situated practices that embed mobile learning into authentic communication and broader SLA (Second Language Acquisition) theory. In practice, this means designing curricula where technology is one component in a richer tapestry of language experiences, ensuring learners develop well-rounded competence.

2. Improving Digital Feedback and Content Quality: To mitigate the risks of automated feedback and questionable input quality, a multi-pronged approach is needed. One strategy is to incorporate teacher mediation and student training in digital literacy. As Sadigzade (2025) concludes in her study on AI feedback, effective use of these tools *"requires teacher mediation, student training in feedback literacy, and institutional guidelines"*. Concretely, teachers can demonstrate to students how to critically evaluate suggestions from a grammar checker or translation app – treating it as a helpful peer rather than an infallible authority. Students can be taught to ask: *Why did the AI suggest this change? Could it be wrong?* Such reflection turns a potential crutch into a learning experience. Institutions should also set ethical guidelines (for instance, rules on using AI for assignments to prevent plagiarism and protect academic integrity). Meanwhile, developers of language apps can collaborate with linguists and educators to improve content accuracy and cultural relevance. Alisoy & Sadiqzade (2024) recommend *"concerted effort from educators, developers, and policymakers to create inclusive, high-quality, and ethically sound solutions."* This might involve vetting user-generated content on language exchange platforms, using AI to filter out common errors in exercises, or providing localized content for diverse dialects. By raising the quality of input and feedback, we can ensure learners aren't led astray by the very tools meant to help them.

3. Managing Distraction and Cognitive Load: Addressing the attention challenge requires both technical design choices and user habits. App designers can play a role by minimizing extraneous gamification that doesn't serve learning and by including focus modes (e.g. disabling notifications or locking out other apps during study time). Educators and parents, on the other hand, should guide students in creating *structured routines* for digital learning – treating it with the same seriousness as a classroom lesson. For young children, this might mean co-viewing and interaction: studies show that when parents engage with children during educational screen time (for example, discussing a Sesame Street episode), the child's language gains are much higher than when viewing alone. Thus, parental involvement is key to navigating early childhood screen risks. For older students, teaching time-management and self-regulation strategies is crucial. Simple practices like scheduling short, uninterrupted study sessions (free of multitasking) and reflecting on one's own digital habits can increase awareness and reduce distraction. On an institutional level, schools could provide workshops on digital study skills. The pandemic experience has already prompted many such initiatives, recognizing that simply handing out devices is not enough – students must learn *how to learn* with devices effectively. Where possible, ensuring that digital learning occurs in an environment conducive to focus (a quiet space, or monitored computer lab) can also help. These steps collectively aim to transform digital tools from potential sources of cognitive overload into streamlined aids that respect the learner's attentional limits.

4. Promoting Equity in Digital Language Education: To prevent the digital divide from widening, equitable access must be a cornerstone of any large-scale implementation of language technology. Policymakers should prioritize investments in infrastructure, such as expanding broadband internet to rural or underserved areas and providing affordable or free devices to students in need. In line with these needs, experts call for stakeholders to *"invest in infrastructure, training, and collaborative development while adhering to ethical guidelines"* as digital learning expands. This means that governments and educational institutions might subsidize internet access or negotiate with ed-tech companies for free licenses for low-income schools. Additionally, teacher training programs must include up-to-date digital pedagogy components so that all teachers – not just the tech-savvy or well-resourced – can confidently integrate technology. When teachers across a district are uniformly prepared, students receive more consistent benefits. Another aspect of equity is making content accessible for those with disabilities (through features like captions, screen reader compatibility, etc.), ensuring inclusive design. We also have to be mindful of socioeconomic disparities in home support. If one student's home environment allows for ample computer use and encouragement, while another's does not, after-school language practice could diverge greatly. Mentoring programs or community language centers with internet access could help bridge this gap. Ultimately, an equitable approach recognizes digital language learning as a public good: the aim is to make high-quality resources available to all learners, regardless of their background, so that technology becomes a force for narrowing achievement gaps rather than widening them.

5. Safeguarding Linguistic Diversity: To navigate the risk of linguistic homogenization, conscious efforts are needed to include and uplift *minority languages and diverse dialects* in digital spaces. This is a call to action for both communities and technologists. The European Parliament report (2020) stresses that preventing digital extinction of lesser-used languages will require "huge efforts by speakers' communities and language technology specialists" to create digital content and tools for those languages. In practice, such efforts might include developing language learning apps for indigenous languages, digitizing folklore and literature, or building speech recognition models for understudied languages. International organizations and local governments can provide grants or platforms to support these initiatives. For instance, libraries or cultural institutions could host hackathons to develop basic e-learning resources (like flashcard apps or YouTube lessons) in endangered languages. Tech companies, on their part, should be encouraged to localize their interfaces and curricula into more languages – not just the most profitable markets. Even small design choices, like allowing users to set interface instructions in their mother tongue, can validate and normalize the use of those languages online. Additionally, educators in multilingual settings should emphasize additive bilingualism: encouraging students to use technology to strengthen both the second language *and* their first language. For example, students might create bilingual video projects or maintain digital journals in both languages. By positioning technology as a tool for *enrichment* rather than replacement, we can foster multilingual digital citizens. In summary, actively incorporating linguistic diversity into digital learning not only protects cultural heritage but also enriches the learning experience for all – since exposure to multiple languages can enhance cognitive flexibility and empathy among students.

Conclusion

The advent of digital learning tools has undeniably revolutionized language education, offering flexibility and novel ways to engage learners. Yet, as this analysis has made clear, innovation in the digital realm comes with its own set of challenges that educators and stakeholders must carefully manage. We have identified critical linguistic risks – from gaps in communicative skills and flawed input to attention attrition, inequitable access, and threats to language diversity. These findings highlight that successful language acquisition in the digital age is not guaranteed by technology alone; it *depends on how technology is used* within a pedagogically sound framework.

Encouragingly, the research also charts a path forward. By adopting a reflective, blended approach that unites the strengths of human instruction and digital resources, we can mitigate many of the risks outlined. Practical measures such as teacher-guided use of AI feedback, stricter screen time management for youngsters, infrastructure investments, and inclusive content development emerge as strategies to ensure that digital platforms truly enrich language learning. As Alisoy and Sadiqzade (2024) articulate, despite the challenges, mobile and digital tools have the potential to be "an essential tool for achieving effective and equitable language education," provided that stakeholders invest in the necessary support systems and safeguards.

In conclusion, navigating linguistic risks in digital learning is about striking a prudent balance – leveraging the global connectivity and adaptive power of technology while maintaining the human-centric, social nature of language learning. By learning from early implementations and research across different countries, we can build digital language learning landscapes that are not only innovative and engaging but also theoretically sound, culturally sensitive, and accessible to all learners. Such an ecosystem will attract more educators and students, inspire further research, and ultimately lead to improved outcomes and rich multilingual competence. In embracing digital tools with eyes open to their pitfalls, we ensure that the next generation of language learners can reap the benefits of both modern technology and timeless linguistic wisdom, confidently stepping into a connected global society.

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