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Post-Pandemic Integration of Digital Tools in Writing Pedagogy: Perspectives from Higher Education Students

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ABSTRACT

The integration of digital tools in higher education has reshaped English as a Foreign Language (EFL) writing instruction, particularly in supporting students' academic writing development. This study investigates English Education Department students' perceptions of the use of digital tools to support writing skills, focusing on their functionality, accessibility, and instructional relevance. The research aims to describe how digital tools are perceived as learning media in enhancing writing activities within a 21st-century educational context. A quantitative survey design was employed involving 128 English Education Department students at Universitas Lancang Kuning selected through probability sampling. Data were collected using a structured questionnaire adapted from Shin and Son, consisting of 14 Likert-scale items. The data were analyzed using descriptive statistical techniques, including mean and standard deviation, to determine overall perception levels. The findings reveal that students generally perceive digital tools positively in supporting their writing skills, as indicated by a high grand mean score. Digital tools were considered effective in improving motivation, facilitating idea development, and enabling flexible learning beyond classroom limitations. In conclusion, digital tools are perceived as valuable resources for supporting EFL writing skills. It is suggested that educators integrate digital tools more systematically into writing instruction, and future studies examine their direct impact on writing performance.

Key Words: Digital Tools; Students' Perception; Writing Skills

ABSTRAK

Integrasi alat digital dalam pendidikan tinggi telah membentuk kembali instruksi menulis Bahasa Inggris sebagai Bahasa Asing (EFL), terutama dalam mendukung pengembangan penulisan akademik siswa. Penelitian ini menyelidiki persepsi mahasiswa Jurusan Pendidikan Bahasa Inggris tentang penggunaan alat digital untuk mendukung keterampilan menulis, dengan fokus pada fungsionalitas, aksesibilitas, dan relevansi instruksionalnya. Penelitian ini bertujuan untuk mendeskripsikan bagaimana alat digital dianggap sebagai media pembelajaran dalam meningkatkan kegiatan menulis dalam konteks pendidikan abad ke-21. Penelitian ini menggunakan desain survei kuantitatif yang melibatkan 128 mahasiswa Program Studi Pendidikan Bahasa Inggris di Universitas Lancang Kuning yang dipilih melalui probability sampling. Data dikumpulkan dengan menggunakan kuesioner

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terstruktur yang diadaptasi dari Shin dan Son, yang terdiri dari 14 item skala Likert. Data dianalisis dengan menggunakan teknik statistik deskriptif, termasuk rata-rata dan standar deviasi, untuk menentukan tingkat persepsi secara keseluruhan. Temuan menunjukkan bahwa siswa secara umum mempersepsikan alat digital secara positif dalam mendukung keterampilan menulis mereka, seperti yang ditunjukkan oleh skor rata-rata keseluruhan yang tinggi. Perangkat digital dianggap efektif dalam meningkatkan motivasi, memfasilitasi pengembangan ide, dan memungkinkan pembelajaran yang fleksibel di luar keterbatasan ruang kelas. Kesimpulannya, alat digital dianggap sebagai sumber daya yang berharga untuk mendukung keterampilan menulis EFL. Disarankan agar para pengajar mengintegrasikan alat digital secara lebih sistematis ke dalam pengajaran menulis, dan penelitian di masa depan memeriksa dampak langsungnya terhadap kinerja menulis.

Kata Kunci: Alat Digital; Persepsi Siswa; Keterampilan Menulis

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INTRODUCTION

The post-COVID-19 pandemic period has marked a decisive turning point in higher education, particularly in the integration of digital technologies into language learning. What initially emerged as an emergency response to prolonged campus closures has evolved into a sustainable pedagogical shift, where digital tools are no longer supplementary but structurally embedded in instructional design. Recent empirical studies indicate that learning management systems, collaborative writing platforms, and AI-supported language tools have become integral to English language instruction, enabling flexibility, continuity, and expanded learner engagement beyond physical classrooms (AlGerafi et al., 2023). In this context, digital transformation is understood not merely as technological adoption, but as a reconfiguration of teaching practices aligned with constructivist and socio-cultural learning theories, which emphasize interaction, scaffolding, and learner agency. As universities increasingly institutionalize hybrid and fully online models, digital literacy and technology-mediated pedagogy are now considered core competencies in contemporary English language education (Tasneem, 2021).

Within this digitally transformed learning ecosystem, writing remains one of the most cognitively demanding and pedagogically challenging English language skills for EFL learners. Unlike receptive skills, writing requires the simultaneous orchestration of grammatical accuracy, appropriate lexical selection, logical organization, and coherent idea development, all of which must be achieved within the constraints of academic conventions. Recent research consistently shows that EFL students continue to struggle with syntactic complexity, cohesive devices, and the ability to articulate arguments clearly, even when supported by digital tools (Rizvanović et al., 2023). From a cognitive process perspective, writing imposes a high cognitive load, as learners must plan, translate, and revise text concurrently, often in a non-native language (Sweller, 2024). These challenges are further intensified in academic writing contexts, where expectations for clarity, critical thinking, and originality are elevated.

The intersection between accelerated digital transformation and persistent writing difficulties has generated renewed scholarly attention in recent years. While digital platforms offer affordances such as automated feedback, collaborative drafting, and increased exposure to authentic language input, empirical evidence suggests that technology alone does not automatically resolve fundamental writing problems (Nurhidayah, 2017). Instead, effective writing development in post-pandemic higher education depends on pedagogically informed

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integration of digital tools that align with process-based writing theory and self-regulated learning frameworks. Studies conducted after 2020 emphasize that when digital tools are strategically used to support planning, feedback, and revision stages, they can significantly enhance learners' writing accuracy and coherence (Sato, 2022). Consequently, understanding writing instruction in the post-COVID-19 digital era requires a balanced perspective that recognizes both the transformative potential of technology and the enduring complexity of writing as a language skill.

Recent empirical evidence consistently shows that EFL learners in Indonesian higher education still encounter substantial challenges in academic writing, even though they are increasingly immersed in digital learning environments. Studies conducted in the last five years reveal that persistent problems include limited control of academic vocabulary, weak coherence and cohesion, inadequate argument development, and insufficient awareness of genre conventions in academic texts (Zhang & Zhang, 2021). These difficulties suggest that digital exposure alone does not automatically translate into improved writing competence. From a sociocognitive perspective, writing development requires guided practice, meaningful feedback, and sustained interaction with academic discourse communities, elements that are not always guaranteed in digitally mediated settings (Hyland, 2021). Consequently, the gap between technological access and actual writing proficiency remains a critical issue in Indonesian EFL contexts, indicating the need for more pedagogically grounded integration of digital resources.

In the post-COVID-19 educational landscape, digital tools have undergone a significant conceptual shift from being temporary emergency solutions to becoming normalized instructional resources. Hybrid and flexible learning models are now widely adopted in Indonesian universities, positioning digital platforms as integral components of everyday academic practices rather than supplementary options (Putra & Hidayaturrahman, 2020). This normalization aligns with theories of autonomous learning, which emphasize learner agency, self-regulation, and strategic use of learning resources (Ma et al., 2024). Within this framework, digital technologies offer opportunities to support academic writing through asynchronous drafting, iterative revision, and access to authentic academic materials. However, recent studies argue that without explicit instructional design and scaffolding, the potential of digital tools to enhance writing autonomy remains underutilized (Widyastuti & Utami, 2018). Therefore, understanding how digital environments can be systematically leveraged to address enduring writing challenges is essential for improving academic writing outcomes among Indonesian EFL learners in the post-pandemic era.

Despite the rapid expansion of digital platforms in higher education, empirical investigations that systematically explore students' perceptions of their effectiveness in enhancing writing skills remain comparatively scarce. Existing studies within the last five years tend to emphasize learning outcomes, technological affordances, or instructional design, often overlooking learners' subjective evaluations as a critical dimension of pedagogical effectiveness. From the perspective of constructivist learning theory, students' perceptions play a central role in shaping engagement, motivation, and self-regulated learning behaviors, all of which are essential for writing development. Recent research has suggested that positive learner perceptions toward digital writing tools such as collaborative editors, automated feedback systems, and learning management systems can significantly influence the quality of writing processes and outcomes (Taye & Mengesha, 2024). However, these findings are often context-specific and fragmented, indicating the need for more systematic and perception-oriented inquiry.

The COVID-19 pandemic has further transformed digital platforms from

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supplementary resources into core instructional media, particularly in language education. In post-pandemic learning environments, digital tools are no longer perceived merely as emergency solutions but as integral components of academic writing instruction. Studies published after 2020 indicate that sustained exposure to digital writing environments has reshaped students' attitudes toward feedback, collaboration, and revision practices (Bozkurt et al., 2024). Nevertheless, much of the recent literature has focused on teachers' readiness or institutional implementation, leaving students' perspectives underrepresented. This imbalance is problematic, as sociocultural theory emphasizes that writing development emerges through learners' interaction with tools, peers, and instructional contexts, all of which are mediated by students' perceptions and experiences.

Addressing this empirical gap, the present study investigates English Education students' perceptions of digital tool use for writing development in a post-COVID-19 context. By foregrounding students' voices, this research responds to recent calls for learner-centered evaluations of educational technology effectiveness (Conrad et al., 2024; Du et al., 2022). The focus on English Education students is particularly relevant, as they are expected not only to develop advanced academic writing skills but also to become future educators who will integrate digital tools into their own pedagogical practices. Through a systematic analysis of students' perceptions, this study contributes up-to-date empirical evidence that clarifies how digital platforms are experienced, valued, and perceived as supportive of writing development, thereby strengthening the theoretical and practical understanding of digital writing instruction in contemporary higher education.

METHODS

Research design

This study employed a quantitative survey design to systematically investigate students' perceptions of digital tool integration in academic writing. A quantitative approach was selected because it enables the collection of standardized data that can be statistically analyzed to reveal patterns, tendencies, and relationships among variables in a reliable and replicable manner. In line with contemporary educational research, survey-based quantitative designs are particularly effective for capturing learners' perceptions at scale, especially in technology-enhanced learning contexts (Creswell & Creswell, 2018). By operationalizing perceptions into measurable indicators, the design allowed for empirical examination of how students evaluate the usefulness, motivational impact, and pedagogical relevance of digital writing tools in a post-COVID-19 learning environment. This approach aligns with recent studies emphasizing the importance of evidence-based evaluation of digital learning practices following the rapid transition to online and blended instruction (Fang & Abdullah, 2024).

Research site and participants

The research was conducted in the English Education Department of a higher education institution, which has actively implemented digital learning platforms in response to post-pandemic instructional demands. The participants comprised 128 undergraduate students drawn from three academic cohorts (2022–2025), representing learners with varied academic experiences and exposure to digital writing practices. Probability sampling was applied to ensure that each student had an equal chance of selection, thereby enhancing the representativeness and generalizability of the findings. Such sampling techniques are widely recommended in quantitative educational research to minimize selection bias and strengthen external validity (Jiang et al., 2023). The inclusion of multiple cohorts also enabled a more comprehensive portrayal of students' perceptions across different stages of academic

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progression, which is crucial in understanding sustained engagement with digital tools in language learning contexts (Lamb & Arisandy, 2020).

Data collection and analysis

Data were collected using a 14-item Likert-scale questionnaire adapted from the foundational instrument developed by Vodă et al., (2022), which was carefully contextualized to reflect contemporary digital learning environments. The adaptation process focused on aligning the items with current post-COVID-19 instructional realities, including increased reliance on online platforms and blended learning models. The instrument measured four key constructs: perceived usefulness, learner competence, motivation, and the integration of digital tools in writing activities. These dimensions are consistent with established theoretical frameworks such as the Technology Acceptance Model and self-determination theory, which remain central to recent investigations of educational technology adoption (Scherer et al., 2020; Ryan & Deci, 2022). Data analysis was conducted using SPSS, employing descriptive statistical techniques including mean, median, mode, variance, and standard deviation. This analytical procedure provided a clear and rigorous summary of students' response distributions, ensuring transparency and methodological robustness, as recommended in recent quantitative research standards in applied linguistics and educational technology (Abbas Shah et al., 2024).

FINDINGS AND DISCUSSION

Findings

The empirical findings of this study demonstrate a notably high level of positive student perception toward the integration of digital tools to support writing skills in the post-COVID-19 educational landscape. This outcome reflects a broader pedagogical shift in which digital learning environments are no longer perceived as emergency substitutes but as legitimate and effective instructional ecosystems. Recent studies have confirmed that post-pandemic learners tend to evaluate digital tools more favorably due to increased familiarity, autonomy, and flexibility in learning processes (Leung & Cheng, 2019; Yang & Yang, 2025). From a sociocognitive perspective, this positive perception aligns with constructivist learning theory, which emphasizes learner-centered environments and meaningful interaction mediated by technology. The normalization of digital practices after prolonged remote learning periods has consequently reshaped students' expectations regarding writing instruction and academic engagement.

Quantitatively, the grand mean score of 3.12 accompanied by a relatively low standard deviation of 0.58 provides statistical evidence of strong agreement and response consistency among participants. This pattern indicates not only favorable attitudes but also a stable and shared evaluation of digital writing tools across the sample. Such consistency suggests that students' perceptions are not incidental or cohort-specific but represent a broader consensus shaped by sustained exposure to digital learning platforms. Comparable findings have been reported in recent large-scale surveys, which highlight reduced perceptual gaps among learners as digital literacy becomes increasingly embedded in higher education curricula (Bereczki & Kárpáti, 2021). The empirical stability of these responses reinforces the argument that digital tools have transitioned from optional supplements to integral components of writing pedagogy.

Furthermore, students perceived digital tools as particularly effective in enhancing writing quality, learning motivation, and access to academic resources beyond the constraints

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of physical classrooms. These perceptions resonate with self-determination theory, which posits that autonomy and competence significantly influence learner motivation. Digital platforms allow students to revise texts iteratively, access diverse reference materials, and receive timely feedback, thereby fostering a sense of control over the writing process. Recent empirical research supports this view, indicating that digital writing environments contribute to improved textual coherence, vocabulary development, and sustained engagement (Hyland, 2021). In the post-pandemic era, such affordances have become essential rather than supplementary, especially for students navigating hybrid or fully online academic contexts.

In addition, online interaction and digital communication were perceived as beneficial for developing writing-related communicative competence. Through discussion forums, collaborative documents, and peer feedback systems, students engage in authentic written communication that mirrors real-world academic and professional practices. This finding is consistent with interactionist theories of language learning, which emphasize the role of meaningful interaction in developing communicative competence. Recent studies have shown that digitally mediated interaction enhances pragmatic awareness and discourse-level writing skills, particularly in asynchronous learning settings (Mhlanga, 2024). The ability to negotiate meaning and refine written expression through online exchanges has thus emerged as a critical advantage of digital writing instruction.

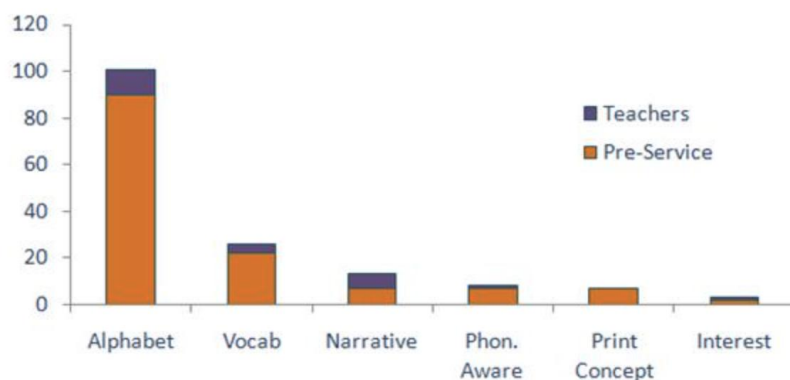
Finally, the low variability in responses across cohorts indicates a shared perception of digital learning tools, reflecting the deep institutionalization of digital practices following the pandemic. This convergence suggests that students, regardless of academic background or year of study, now regard digital writing tools as a standard feature of effective learning environments. Such uniformity aligns with recent post-pandemic research emphasizing the long-term pedagogical impact of COVID-19 on higher education systems worldwide. Collectively, these findings underscore the sustained relevance of digital tools in writing instruction and highlight their role in shaping resilient, inclusive, and future-oriented learning practices in the post-COVID-19 era.

Table 1 Title

Themes	Sub-themes
Theme one: The comprehensive overview of the bilingual education program	Status Accreditation Admission policy Student body Curriculum Teachers Language policy Teaching materials Student assessment

Figure 1 Numbers of Teachers and Pre-Service

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Discussion

The findings of this study are theoretically grounded in constructivist and socio-cognitive learning perspectives, which position learners as active agents in constructing knowledge through meaningful interaction, reflection, and contextualized feedback. In technology-mediated language learning environments, these theories emphasize that autonomy is not merely an individual trait but a dynamic capability shaped by digital tools that enable self-regulation, peer collaboration, and continuous formative feedback. Recent empirical studies have confirmed that mobile and online learning platforms facilitate learner-centered practices by allowing students to control learning pace, select resources, and engage in authentic communicative tasks, thereby strengthening cognitive engagement and metacognitive awareness (Follmer & Sperling, 2018). The alignment between the present results and these frameworks suggests that the effectiveness of technology integration lies not only in access to digital devices but also in the pedagogical affordances that support interaction and reflective learning processes.

From a socio-cognitive standpoint, interaction and feedback function as central mechanisms through which knowledge is co-constructed. Digital learning environments provide immediate and multimodal feedback, enabling learners to negotiate meaning, notice linguistic gaps, and refine their performance in real time. Recent studies in mobile-assisted and online learning contexts indicate that such feedback-rich environments promote sustained learner autonomy and collaborative learning behaviors, particularly in post-pandemic educational settings (M. Li, 2025). The positive perceptions reported by students in this study reinforce the argument that technology-mediated interaction fosters a sense of agency and responsibility, which are essential components of autonomous learning within constructivist paradigms.

Moreover, the favorable student perceptions reflect a significant developmental trajectory from emergency remote learning to stable academic competence in the post-COVID-19 era. During the pandemic, students were compelled to acquire digital literacy skills as a matter of necessity; however, recent evidence suggests that these skills have not diminished with the return to face-to-face or hybrid learning models. Instead, they have evolved into sustained competencies that support independent learning, critical evaluation of digital resources, and effective academic communication (Fang & Abdullah, 2024; Panagiotidis, 2018). The present findings corroborate this transition, indicating that students now perceive digital tools not as temporary substitutes but as integral components of their learning ecology.

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In this context, digital literacy functions as a foundational competence that mediates learner autonomy and academic resilience. Recent research highlights that post-pandemic learners demonstrate greater confidence in navigating learning management systems, mobile applications, and online collaborative spaces, which in turn enhances their capacity for self-directed learning and peer-supported knowledge construction (Akinradewo et al., 2025; Muhamad Pilus & Nguyen, 2023). The positive perceptions identified in this study therefore signal a maturation of students' technological engagement, aligning with contemporary theories that view digital competence as a catalyst for long-term academic development rather than a crisis-driven adaptation.

Digital tools were perceived by learners as instrumental in facilitating the core stages of the writing process, particularly idea generation, drafting, revising, and peer feedback. From an empirical perspective, this perception aligns with process-based writing theory, which emphasizes writing as a recursive and cognitively demanding activity rather than a linear product-oriented task. Digital writing platforms such as collaborative documents, grammar-support applications, and online brainstorming tools enable learners to externalize ideas more efficiently during the pre-writing stage, reduce cognitive load during drafting, and engage in iterative revision with greater flexibility. Recent studies indicate that features such as real-time editing, automated feedback, and version tracking support metacognitive awareness and self-regulated learning, allowing students to monitor their progress and refine their texts more systematically (Hyland, 2021). As a result, digital tools function not merely as technical aids but as mediating artifacts that shape how learners conceptualize and execute academic writing tasks.

In addition, the revising and feedback stages of writing appear to benefit substantially from digitally mediated interaction. Online peer feedback systems and learning management platforms create spaces for asynchronous and synchronous collaboration, which expands opportunities for meaningful revision beyond classroom constraints. Empirical evidence from higher education and EFL contexts shows that students receiving peer and automated feedback through digital platforms demonstrate improved text organization, lexical choice, and grammatical accuracy compared to those relying solely on traditional feedback mechanisms (Matzembacher et al., 2019; Rasyidah et al., 2025). These environments also encourage dialogic feedback practices, enabling learners to negotiate meaning, justify revisions, and develop critical awareness of writing quality. Such findings reinforce sociocultural theory, which views learning as socially constructed through interaction and scaffolded support.

Consistent with prior research conducted within the last five years, the integration of digital platforms in writing instruction has been shown to enhance learners' motivation, collaboration, and writing confidence. Digital environments tend to lower affective barriers by providing a less threatening space for experimentation and revision, particularly for learners who experience anxiety in face-to-face writing contexts. Studies by Li et al., 2025 and Zheng & Wang (2023) demonstrate that students engaged in technology-enhanced writing tasks report higher levels of engagement and confidence, largely due to increased autonomy and immediate feedback. Furthermore, collaborative digital writing tasks promote a sense of shared responsibility and collective knowledge construction, which positively influences learners' willingness to write and revise. Taken together, these findings suggest that digital tools not only support technical aspects of the writing process but also contribute to affective and social dimensions that are crucial for sustainable writing development in contemporary educational contexts.

The post-COVID-19 educational landscape has fundamentally redefined the role of

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digital tools in writing instruction, transforming them from emergency substitutes into core pedagogical resources. During the pandemic, digital platforms were initially adopted as short-term responses to maintain instructional continuity. However, empirical evidence gathered in the years following the crisis indicates that these tools have sustained relevance beyond emergency remote teaching. Recent studies show that learning management systems, collaborative writing applications, and AI-assisted feedback platforms now function as embedded components of writing pedagogy, shaping how students plan, draft, revise, and reflect on their written work (Jaihow & Sinwongsuwat, 2024; Zhang & Zhang, 2021). This shift marks a structural change rather than a transitional phase, signaling a long-term integration of technology into writing instruction.

From a theoretical perspective, the normalization of digital tools in writing classrooms aligns closely with sociocultural learning theory and process-based writing pedagogy. Sociocultural theory emphasizes learning as a mediated activity, where tools and social interaction play a central role in cognitive development. In post-pandemic classrooms, digital writing platforms serve as mediational artifacts that facilitate peer collaboration, scaffold revision processes, and enable real-time teacher feedback, thereby extending learning beyond traditional classroom boundaries. Recent empirical research confirms that such digitally mediated writing environments enhance learner engagement and promote deeper metacognitive awareness during the writing process (Conrad et al., 2024). Consequently, digital tools are no longer peripheral aids but active agents in shaping writing development.

Moreover, the sustained use of digital writing technologies reflects a pedagogical shift toward flexibility, inclusivity, and learner-centered instruction. Post-COVID-19 policies in many educational systems encourage blended and hybrid learning models, positioning digital tools as essential for accommodating diverse learner needs. Studies published within the last five years highlight that digital writing environments support differentiated instruction through adaptive feedback, multimodal composition, and asynchronous collaboration, all of which are critical for developing writing competence in heterogeneous classrooms (Naz et al., 2023). These findings underscore the empirical relevance of digital tools as long-term instructional assets rather than temporary innovations.

In summary, the post-pandemic educational context has institutionalized digital tools as integral components of writing instruction, supported by both theory and recent empirical evidence. What began as an emergency response has evolved into a systematic pedagogical transformation, where digital technologies enhance writing processes, foster collaboration, and support sustainable learning practices. This shift not only reflects the lessons learned during the pandemic but also signals a future-oriented approach to writing instruction that is resilient, adaptive, and grounded in contemporary educational research.

CONCLUSIONS AND SUGGESTION

In conclusion, this study confirms that digital tools are perceived by students as effective, relevant, and sustainable supports for writing skill development in the post-COVID-19 pandemic era. These perceptions indicate a fundamental transition in higher education writing pedagogy, where digital technologies have evolved from temporary crisis responses into stable instructional resources. The positive evaluations reported by students underscore the growing acceptance of digital environments as legitimate and productive spaces for developing academic writing skills. Furthermore, the findings highlight that digital technologies enhance instructional flexibility, learner engagement, and accessibility, which are essential elements of contemporary writing instruction. Such affordances support student-

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centered learning and align with established theories that emphasize interaction, autonomy, and continuous feedback in writing development. The consistently favorable perceptions suggest strong potential for the continued integration of digital tools beyond emergency-driven adoption, reinforcing their long-term relevance in higher education contexts.

However, this study also emphasizes that the effectiveness of digital tools depends on their pedagogical implementation. Purposeful and guided instructional strategies are necessary to ensure that technology use meaningfully supports writing objectives rather than functioning as a mere delivery medium. Consequently, educators are encouraged to design structured learning activities that integrate digital tools with clear instructional goals and sustained feedback mechanisms. Finally, while this study provides important insights into students' perceptions, it is limited in its focus on attitudinal outcomes. Future research should therefore examine the long-term impact of digital tool integration on actual writing performance within post-pandemic educational systems. Such investigations are essential to validate the sustainability and instructional value of digital writing pedagogy in higher education.

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