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Research Article

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Abstract

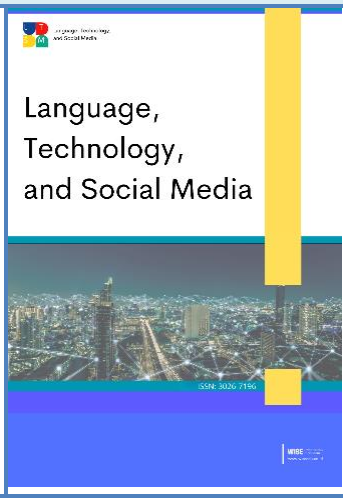
Writing anxiety remains a persistent challenge for EFL university students, shaping their cognitive, affective, and behavioral engagement with academic writing. While digital and AI-assisted tools are increasingly used to support writing development, little is known about how learners with different personality traits particularly extroverts and introverts employ technology to manage writing-related anxiety. This article reports the qualitative component of an explanatory sequential mixed-methods study that examined levels, types, causes, and coping strategies of English writing anxiety among Indonesian EFL undergraduates. Building on quantitative findings derived from the EPQ, SLWAI, and CWAI, semi-structured interviews were conducted with 20 purposefully selected students (10 extroverts; 10 introverts) to explore their technology-mediated coping strategies. Thematic analysis revealed clear personality-based distinctions. Extrovert students relied on stimulation-rich, interactive, and feedback-oriented technologies including YouTube tutorials, social media videos, writing applications, and AI tools to boost motivation, model writing processes, and reduce fear of errors. Technology served as an external scaffold that energized their writing engagement. In contrast, introvert students preferred quiet, private, and self-paced digital environments. They used calming media, reference-based tutorials, translation tools, vocabulary apps, and AI feedback to regulate emotions, clarify ideas, and resolve linguistic uncertainties in low-pressure settings. Technology functioned as an internal regulator that supported cognitive clarity and emotional steadiness. These findings underscore that technology-mediated coping is personality-sensitive, highlighting the need for flexible, personalized digital interventions to support diverse emotional and cognitive needs in EFL writing contexts.

Keywords: English Writing Anxiety; Technology-Mediated Strategies; Extroversion and Introversion; EFL Learners; AI-Assisted Tools.

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INTRODUCTION

Producing written texts in a second or foreign language presents significant challenges for university students, particularly in English as a Foreign Language (EFL) contexts. Compared with other language skills, writing requires learners to simultaneously mobilize linguistic knowledge, higher-order cognitive processing, rhetorical organization, and affective regulation [1], [2]. Among the affective variables shown to influence writing performance such as anxiety [3], [4], [5], self-efficacy [6], perfectionism [7], and achievement emotions related to control and value appraisals [8] writing anxiety has consistently been identified as a major barrier to producing clear, coherent, and accurate texts. Writing anxiety, conceptualized as a situation-specific form of tension and apprehension related to writing tasks [9], has been linked to diminished writing performance, avoidance tendencies, and negative emotional states [3], [6], [10], [11].

In the Indonesian EFL context, recent studies have observed rising concern about students' writing anxiety, reporting that a substantial proportion of learners experience moderate to high anxiety driven by linguistic difficulties, fear of negative evaluation, and socio-cognitive pressures [12], [13]. Empirical evidence shows that limited vocabulary, inadequate grammar mastery, time constraints, and low writing self-efficacy are among the most common anxiety-inducing factors [10], [11], [14]. These findings align with cognitive appraisal theories of stress [15], [16] and the control-value theory of achievement emotions, which explain anxiety as a reaction to learners' interpretations of task demands, evaluation pressure, and anticipated failure [4], [5], [8]

Personality also plays a crucial role in shaping learners' emotional experiences and learning behaviors, particularly along the introversion-extroversion continuum. Extroverts characterized by sociability and the need for external stimulation and introverts associated with reflectiveness and sensitivity to overstimulation show distinct learning preferences and behavioral tendencies [17], [18], [19]. Prior research indicates that personality traits influence language performance, communicative behavior, and susceptibility to language anxiety [5], [20], [21] In writing, introverts may benefit from reflective processing, whereas extroverts may find solitary writing tasks less stimulating; nonetheless, both groups experience writing anxiety, albeit for different reasons [22], [23], [24], [25].

Parallel to these developments, the landscape of writing instruction has been transformed by the rapid proliferation of digital technologies, AI-supported writing tools, and social media learning environments. Automated writing evaluation (AWE), grammar checkers, corpora, generative AI systems, mobile learning applications, and informal social-media-based learning spaces now play a growing role in supporting EFL writers. Recent evidence shows that AWE and AI-assisted feedback can enhance writing performance, foster self-efficacy, and reduce anxiety by offering immediate, individualized, and low-stakes feedback [26], [27]. Likewise, informal learning through platforms such as YouTube, TikTok, and Instagram provides accessible writing explanations, peer-generated models, and emotionally supportive digital spaces that help students manage writing-related stress [28], [29]. These developments highlight technology's dual role as both a cognitive scaffold and an affective regulator in contemporary writing practices.

However, despite the increasing integration of digital tools in writing instruction, a clear gap remains regarding how extrovert and introvert EFL students differ in their technology-mediated coping strategies for writing anxiety. Existing research tends to examine personality, anxiety, and technology use as separate constructs, leaving unanswered how these domains intersect. Understanding these differences is essential for designing targeted pedagogical interventions

aligned with learners' dispositional preferences. Without such insights, digital writing support risks overlooking the individualized emotional and cognitive needs that shape students' engagement and anxiety management.

To address this gap, the present article draws on a larger explanatory sequential mixed-methods study examining four dimensions of English writing anxiety levels, types, causes, and coping strategies among extrovert and introvert EFL undergraduates. From the broader dataset, this article focuses specifically on coping strategies that involve digital, AI-supported, and technology-mediated tools. The aim is to provide a detailed analysis of how extrovert and introvert students regulate writing anxiety through technological resources and to explain how personality traits interact with digital environments to shape coping behavior.

The novelty of this study lies in its integration of personality theory, writing anxiety research, and contemporary digital practices. By identifying differentiated patterns of technology-mediated strategy use among extrovert and introvert learners, the study offers pedagogical insights for personalized digital support, improved emotional regulation in writing, and more inclusive technology-enhanced learning environments

LITERATURE REVIEW

Foreign Language Writing Anxiety

Foreign language writing anxiety (FLWA) has long been recognized as a significant affective factor influencing second and foreign language learning outcomes. Cheng [3] defined FLWA as a specific form of anxiety related to the writing process in a target language, characterized by tension, worry, and apprehension that adversely affect learners' performance. Earlier foundational work by Daly and Miller [9] identified writing apprehension as an emotional tendency to avoid writing tasks due to perceived difficulty and fear of negative evaluation. In a similar vein, Horwitz [30] argued that language anxiety has a detrimental impact on language achievement, disrupting learners' cognitive processing during task performance.

FLWA is widely understood as a multidimensional phenomenon influenced by cognitive, linguistic, and environmental factors. Research in EFL contexts consistently shows that students often experience anxiety due to limited linguistic knowledge, including challenges in vocabulary, grammar, and textual organization [10], [12]. Huerta et al. [6] further highlight that low self-efficacy in academic writing contributes significantly to anxiety, which is often aggravated by perfectionism and fear of producing low-quality work [7].

In the Indonesian EFL context, several studies report moderate to high levels of writing anxiety. For example, Wahyuni et al. [11] found that Indonesian university students frequently struggle with academic writing demands, leading to heightened anxiety. Iksan et al. [13] reported similar findings, noting that students' unfamiliarity with academic genres and pressure to perform well in writing tasks contribute substantially to their anxiety. Additionally, Jawas [14] identified linguistic limitations, fear of making mistakes, and pressure from teacher expectations as major sources of writing anxiety among EFL learners.

From a theoretical standpoint, Lazarus [16] conceptualized anxiety as a cognitive appraisal of stressors that exceed an individual's perceived coping resources. Applied to writing, FLWA arises when learners perceive the task as highly demanding and doubt their ability to complete it successfully. Supporting this, MacIntyre and Gardner [4], [5] demonstrated that anxiety affects information processing in second language learning, interfering with attention, encoding, and

retrieval, which are critical for writing performance. Overall, existing research indicates that FLWA is a prominent issue in EFL contexts, shaped by linguistic, psychological, and situational variables. These insights provide a theoretical foundation for examining the role of personality and technology-mediated tools in managing writing anxiety among EFL learners.

Personality Traits in Language Learning (Extroversion–Introversion)

Personality has been recognized as a key individual difference influencing second language acquisition (SLA). Among the most widely studied personality dimensions is the extroversion–introversion continuum, originating from Jung's [31] typology and expanded in the Five-Factor Model [19]. Extroversion is often associated with sociability, assertiveness, risk-taking, and a preference for external stimulation, while introversion is linked to reflective thinking, caution, and a preference for solitary activities [17].

In language-learning contexts, extroversion is commonly associated with oral communication skills, as extroverts tend to seek interaction and are less inhibited in speaking tasks [21]. Lucas and Diener [18] noted that extroverts experience higher positive affect in social situations due to their sensitivity to social rewards. Introverts, however, often prefer individual work and are more comfortable with tasks requiring quiet concentration. Their careful and reflective nature can benefit writing accuracy, but may also heighten sensitivity to evaluation and error risks.

Research examining personality in writing reveals mixed results. Boroujeni et al. [22] found that while extroverts may take more risks in writing, introverts tend to produce more controlled and structurally accurate texts. Similarly, Kafryawan [23] and Zainuddin [24] found that introvert EFL learners demonstrate higher precision in grammar and vocabulary use, whereas extrovert learners may generate ideas more quickly but with more frequent linguistic errors.

Personality also plays a significant role in foreign language anxiety. Dewaele [20] found that introverts tend to experience higher anxiety in language tasks, particularly when evaluation is involved. Hz [25] further demonstrated that introverted students exhibit higher writing anxiety due to fear of negative evaluation and perfectionistic tendencies. Extroverts, by contrast, often benefit from their adaptive emotional regulation and reliance on social support.

Given these differences, extroversion and introversion shape learners' preferences for writing strategies, feedback mechanisms, and use of technology. Understanding these personality-based patterns is essential for exploring how technology-mediated interventions can support writing anxiety regulation.

Technology-Mediated Learning and Digital Tools in EFL Writing

Rapid technological advancement has significantly transformed the landscape of EFL instruction, especially in writing. According to Hyland [32], digital tools provide learners with increased access to authentic resources, opportunities for revision, and collaborative environments that support writing development. Technology also allows learners to engage with writing tasks at their own pace, reducing performance pressure and facilitating self-directed learning.

Among the most influential tools in recent years are automated writing evaluation (AWE) systems. Wei et al. [26] conducted a randomized controlled trial demonstrating that AWE significantly enhances learners' writing accuracy, cohesion, and overall performance. Their findings also indicate that AWE reduces learners' writing anxiety by providing consistent, immediate feedback without the emotional discomfort associated with teacher evaluation.

Complementing this perspective, Ghane et al. [27] found that written corrective feedback delivered through digital platforms improves writing performance, strengthens self-efficacy, and lowers anxiety.

Other digital tools such as online dictionaries, grammar checkers, collaborative platforms like Google Docs, and digital note-taking applications also contribute to reducing writing anxiety. These tools provide cognitive scaffolding by simplifying complex linguistic tasks and enabling iterative revisions. Kondo and Ying-Ling [33], in their work on coping strategies, noted that learners often use technology to reduce anxiety through resource seeking, rehearsal, and self-regulated learning.

Social media platforms also play an increasingly important role in writing development. YouTube, for example, offers an extensive collection of writing tutorials, grammar explanations, and model texts that learners can access freely. TikTok and Instagram provide short, digestible educational content that supports micro-learning. Santri et al. [29] observed that students often rely on digital media not only for learning but also for emotional regulation, using online resources to alleviate stress before engaging in writing tasks.

At a broader level, Godwin-Jones [28] described how AI-based tools, conversational agents, and immersive environments offer new pathways for language practice. These environments often provide psychologically safe spaces where learners can experiment with language without fear of judgment, which can be particularly beneficial for anxious learners. Taken together, research consistently shows that technology-mediated tools support both the cognitive and affective dimensions of writing, making them valuable resources in addressing writing anxiety.

Technology Use, Personality Differences, and Writing Anxiety Regulation

The intersection of technology use, personality traits, and writing anxiety is a growing area of interest in applied linguistics. Lazarus's [16] appraisal theory suggests that individuals select coping strategies based on their interpretation of task demands and their perceived ability to manage these demands. This framework helps explain why learners with different personality traits adopt different technology-mediated strategies to regulate writing anxiety.

Extrovert and introvert learners tend to engage with technology in distinct ways. Dewaele and MacIntyre [34] emphasized that learners' emotional experiences in L2 contexts are shaped by the interaction of internal traits (such as personality) and external resources (such as digital tools). For extroverts, technology that facilitates communication such as collaborative writing platforms, online discussion forums, or interactive learning apps may align with their preference for social engagement. Their sociability allows them to benefit from peer collaboration, digital feedback exchanges, and communication-based learning tools.

Introverted learners, on the other hand, often prefer technologies that allow independent, reflective work. Tools such as grammar checkers, digital planners, writing enhancement applications, and self-paced online tutorials provide a sense of control and reduce anxiety associated with direct evaluation. Lucas and Diener's [18] findings on introverts' lower tolerance for social stimulation support the idea that non-interactive, self-regulated digital environments are more comfortable for them.

Technology also influences writing anxiety regulation through several mechanisms. First, non-threatening feedback, such as automated corrections or AI-generated suggestions, reduces fear of evaluation [26]. Second, enhanced self-efficacy arises when learners use digital tools to improve

linguistic accuracy and monitor progress [27]. Third, productive distraction from digital media such as watching calming or instructional videos helps students relax before writing, a strategy noted by Santri et al. [29]. Finally, resource accessibility reduces uncertainty and cognitive load, enabling students to engage in writing with greater confidence [12].

The literature suggests that technology serves both cognitive and affective regulatory functions. Yet, the role of personality in shaping technology use remains underexplored, particularly in writing anxiety research. This gap underscores the importance of investigating how extrovert and introvert EFL learners utilize technological tools differently when managing writing anxiety. Such insights can inform more personalized, technology-based pedagogical interventions that support learners' emotional well-being and writing performance.

METHODS

Research Design

This article forms part of a broader explanatory sequential mixed-methods study that investigated the levels, types, causes, and coping strategies of English writing anxiety among EFL university students with extrovert and introvert personality tendencies. In the quantitative phase, students' personality profiles were first identified using the Indonesian adaptation of the Eysenck Personality Questionnaire (EPQ) developed by Wulandari [35], which provided the foundation for comparing anxiety patterns across clearly classified personality groups. To measure the levels and types of English writing anxiety, the study employed Cheng's [36] Second Language Writing Anxiety Inventory (SLWAI). Meanwhile, the causes of writing anxiety were examined through items adapted from the Causes of Writing Anxiety Inventory (CWAI) conceptualized by Zhang [37] and expanded by Rezaei and Jafari [10]. These quantitative results served as the basis for selecting participants and for shaping the guiding questions of the qualitative phase.

The qualitative phase aimed to explain, expand, and contextualize the quantitative findings by exploring how extrovert and introvert students personally experienced writing anxiety and coped with it in their academic routines. Although students reported a wide range of strategies spanning cognitive, affective, behavioral, and avoidance responses the present article narrows its analytical focus to technology-mediated coping strategies, including digital platforms, online resources, and AI-supported writing tools. This delimitation aligns with the article's specific objective of examining how personality traits intersect with contemporary digital practices in managing English writing anxiety, an area that remains underexplored in current L2 writing scholarship.

Following the explanatory sequential logic [38], findings from SLWAI and CWAI informed the development of the semi-structured interview protocol. Interview items were designed to probe emotional, cognitive, and behavioral dimensions of writing anxiety, while also explicitly prompting students to describe any digital or AI-based tools they used to manage stress, clarify ideas, enhance linguistic accuracy, or regulate motivation. In this way, the overall mixed-methods design ensured systematic integration between quantitative patterns and qualitative insights, allowing personality-specific technology-use behaviors to be interpreted with methodological rigor and contextual depth.

Participants

The study involved 118 undergraduate students from the English Education Study Program at Universitas Negeri Gorontalo, spanning three cohorts (2023–2024, 2022–2023, and 2021–2022). All students completed the Indonesian adaptation of the Eysenck Personality Questionnaire (EPQ),

developed by Wulandari [35], which retains the psychometric robustness of the original instrument [39], [40]. Based on the EPQ results, participants were categorized into three personality types: 32 students as extroverts (scores ranging from 61 to 100), 13 students as introverts (scores ranging from 21 to 40), and 73 students as ambiverts (scores ranging from 41 to 60). However, for the qualitative phase of the study, only extrovert and introvert students were selected, while ambivert students were excluded to emphasize the contrasting coping strategies of the extreme personality types.

Participants for interviews were selected through voluntary participation. After receiving their EPQ results, students were invited to take part in the interviews. Only those who willingly agreed to participate, without any incentives or academic pressure, were included. A total of 20 students (10 extroverts and 10 introverts) participated in the qualitative phase of the study. This voluntary and transparent approach ensured that the narratives obtained were from students who felt comfortable discussing their experiences with writing anxiety and technology-mediated coping strategies. The classification into extroverts and introverts was based on the Barret et al. [39], which categorizes individuals based on their level of sociability and responsiveness to external stimuli. Extroverts are sociable, active, and energized by external environments, while introverts tend to be more reserved, introspective, and prefer solitude. Ambiverts exhibit a balance of both traits.

Table 1. Distribution of Personality Categories and Selection of Interview Participants

Personality Category	Number of Students	Participants for Quantitative Phase	Participants for Qualitative Phase (Interviews)
Extrovert	32	32	10 (P1–P10)
Introvert	13	13	10 (P11–P20)
Ambivert	73	-	-
Total	118	45	20

Note: Ambivert students were excluded from the qualitative phase to focus on the contrasting coping strategies of extroverts and introverts.

Data Collection Procedure

Data for the qualitative phase were collected through individual semi-structured interviews designed to extend and clarify the quantitative findings obtained from the EPQ, SLWAI, and CWAI. The interview protocol was developed with reference to the eleven established causes of writing anxiety identified in Zhang [37] and Rezaei and Jafari [10], ensuring conceptual alignment between both phases of the mixed-methods design. The questions were crafted to explore students' emotional experiences, thought processes while engaging in writing tasks, and the specific coping actions they employed particularly those involving digital or AI-supported tools.

Interviews were conducted primarily face-to-face to allow natural rapport-building, richer emotional expression, and deeper elaboration of students' writing experiences. When scheduling conflicts prevented in-person meetings, interviews were conducted online or via phone, maintaining flexibility without compromising the depth of inquiry. All interviews were conducted in Indonesian to ensure comfort and authenticity, lasted approximately 45–60 minutes, were audio-recorded with participants' consent, and transcribed verbatim. Although students described a wide range of coping approaches, the present article focuses specifically on technology-mediated strategies, including YouTube tutorials, social media educational content, digital writing applications, translation tools, AI-assisted platforms, and digital media used for emotional regulation. These qualitative accounts

form the basis for the personality-based thematic patterns presented in the Results and Discussion section.

Data Analysis

The qualitative data were analyzed using a thematic analysis approach, following iterative cycles of familiarization, coding, categorization, and theme refinement. All interview transcripts were first read repeatedly to capture the emotional nuances, cognitive reflections, and behavioral coping patterns embedded in students' narratives. Initial codes were generated inductively, guided by both the structure of the interview protocol and the patterns emerging from participants' accounts. Codes were then organized into broader conceptual categories representing recurring patterns within and across the two personality groups. Themes were refined through constant comparison, ensuring internal coherence and clear distinctions between extrovert and introvert coping tendencies. Particular attention was given to the technological dimension of coping strategies such as entertainment media, YouTube tutorials, translation tools, writing applications, and AI-assisted platforms because the present article focuses on this specific subset of strategies within the broader mixed-methods project.

Throughout the analytic process, the qualitative findings were triangulated with the quantitative results derived from the EPQ, SLWAI, and CWAI to maintain conceptual consistency across methodological phases. This integration strengthened the explanatory depth of the analysis and ensured that the themes presented in the Results and Discussion section meaningfully extend the patterns identified in the quantitative stage.

RESULTS AND DISCUSSION

This section reports how extrovert and introvert EFL students employ technology to cope with English writing anxiety, expanding the quantitative patterns revealed by the SLWAI and CWAI. Although both groups used similar digital tools, their purposes and engagement styles diverged sharply in line with personality-based emotional and cognitive tendencies. The following subsections discuss these strategies and interpret the findings in relation to existing research on foreign language (FL) writing anxiety and personality.

Technology-Mediated Strategies among Extrovert Students

Analysis of the interview data revealed that extrovert students relied heavily on dynamic, stimulation-rich, and socially oriented technologies to regulate their English writing anxiety. Their coping behaviors consistently reflected their dispositional tendencies toward interaction, external stimulation, and high engagement. Four major patterns emerged from the data: emotional distraction and activation, digital skill building, self-directed writing practice, and the use of AI or applications as alternative feedback sources.

A prominent strategy among extroverts involved using entertainment media to manage anxiety, particularly when the anxiety stemmed from fear of negative teacher evaluation or pressure to produce a perfect piece of writing. Students frequently described using films, TikTok videos, or social media reels to momentarily escape feelings of tension. For example, P3 shared, *"Kalau tidak ada saya healing dengan menonton film untuk mengalihkan dari cemas yang berlarut-larut,"* (If nothing else works, I heal myself by watching movies to distract from the lingering anxiety) while P5 explained the importance of having *"something to distract… entah itu nonton video sosmed/main*

HP" (…having something to distract me… whether it's watching social-media videos or using my phone). These tools did not merely function as emotional escape; they acted as activation mechanisms that helped students refresh their minds, boost their mood, and re-energize themselves before returning to writing tasks.

Beyond emotional regulation, extrovert students depended on YouTube tutorials, grammar videos, and short online clips to address cognitive sources of writing anxiety, such as uncertainty about writing techniques or fear of performing poorly on tests. Step-by-step video explanations provided them with concrete, visual models that eased their fear of making mistakes. As P9 described, *"Cari ke YouTube… terus latihan menulis sesuai tutorial YouTube supaya tidak terlalu takut"* (I look things up on YouTube… then practice writing based on the YouTube tutorials so I won't feel too afraid) and added, *"Biasanya liat tutorial video"* (usually I watch tutorial videos). Similarly, P7 stated, *"Belajar grammar dari internet… video sosial media"* (learning grammar from the internet… from social media videos). These digital learning materials offered structured guidance and immediate clarity, which enhanced extroverts' confidence in approaching writing tasks.

Self-directed writing practice through digital platforms also emerged as a key coping strategy. Extrovert students frequently engaged in writing journals, blogs, random essays, poems, or diary entries as a way to build fluency and increase confidence. P1 reported engaging in *"menulis jurnal, blog, membuat esai acak, atau posting di media sosial,"* (writing journals, blogs, random essays, or posting on social media), while P5 emphasized ongoing practice supported by digital exposure, stating, *"Latihan… meskipun hari libur… menonton video pembelajaran Bahasa Inggris"*(practicing… even on holidays… by watching English learning videos). Applications like Duolingo further supported this practice, offering writing prompts and vocabulary reinforcement, as noted by P3, who said, *"Menggunakan aplikasi Duolingo untuk berlatih"* (using the Duolingo application to practice)

Finally, when students felt that lecturer feedback was insufficient or unclear, they turned to digital alternatives including AI tools, correction apps, and writing platforms to compensate for the lack of effective evaluation. P1 shared, *"Saya memanfaatkan platform digital seperti aplikasi atau blog untuk berlatih menulis,"* while P3 noted, *"Pakai Duolingo untuk mengoreksi tulisan."* Meanwhile, P6 highlighted the role of AI, stating, *"Saya juga menggunakan AI untuk mengoreksi hasil tulisan saya."* These tools provided extroverts with a sense of autonomy and cognitive assurance, helping them overcome uncertainty about correctness and structure.

Taken together, these findings show that extrovert students integrate technology into their coping repertoire in ways that match their social and emotional orientation. Technology functions for them as both a motivator and a scaffold offering stimulation, structured guidance, and rapid feedback to reduce writing anxiety and enhance confidence.

Technology-Mediated Strategies among Introvert Students

The interview data revealed that introvert students also relied on a variety of technologies to cope with English writing anxiety, but their use of these tools reflected markedly different psychological needs and personality tendencies. Unlike extroverts, who gravitated toward high-stimulation digital environments, introverts preferred quiet, private, and self-paced technological resources that allowed them to regulate anxiety internally and maintain a sense of control. Their strategies clustered around emotional calming and focus regulation, self-paced digital learning, linguistic

problem-solving, limited but purposeful social interaction, and the use of AI for safe, low-pressure feedback.

A dominant strategy among introverts involved using technology for soothing emotional regulation. When confronted with anxiety particularly related to worries about teacher comments or pressure from frequent writing assignments introverts turned to calming digital activities such as listening to music or watching films. P11 explained that watching a movie helped them relax before writing, while P16 described using music as a way to reduce worry. P13 also noted that simply shifting attention to the phone could help manage fear and overthinking: *"mengalihkan dengan main HP"* (distracting myself by using my phone). These digital behaviors served to stabilize emotions, reduce arousal, and create a mental buffer before they engaged in writing tasks, functioning as a form of quiet internal grounding rather than stimulation.

In addition to emotional regulation, introverts used technology extensively for self-paced learning. They frequently watched TikTok videos and YouTube tutorials to seek writing models, gather ideas, and clarify writing structures. P12 mentioned searching TikTok for examples *"lihat contoh penulisan di TikTok"* (looking at writing examples on TikTok) while P15 explained that they turned to YouTube *"untuk memahami cara menulis yang lebih baik"* (to understand better ways of writing). Others, such as P19 and P13, described using English-language films, online videos, and reading materials for gradual exposure to language structures. These digital resources allowed introverts to absorb information quietly, without pressure or social comparison, aligning with their preference for solitary exploration.

For linguistic challenges, introverts relied heavily on translation tools, vocabulary apps, and online search engines to independently resolve language-related uncertainties. P13 explained using Google Translate to check vocabulary, while P16 noted using language-learning apps to strengthen vocabulary. P18 reported learning new phrases from academic articles and intentionally applying them in writing. These tools supported both cognitive and affective needs by reducing uncertainty and providing private, immediate solutions.

Although introverts generally avoided social interaction in learning, they occasionally engaged in low-stimulation collaboration, typically with one or two close friends. P11 described combining collaborative work with calming background music to remain comfortable and avoid social pressure, reflecting the need for predictability and emotional safety.

Finally, introvert students used AI tools and apps as a non-judgmental and private source of feedback. They appreciated the lack of interpersonal evaluation, which helped reduce their fear of negative judgment. P11 mentioned using AI alongside Duolingo, P18 said the assistance was *"very helpful,"* and P15 described frequently relying on AI for feedback. This pattern suggests that, for introverts, the primary benefit of AI lies in its neutrality and consistency, which allows them to revise their writing without emotional strain.

Overall, introvert students employed technology as a means of quiet emotional regulation, structured self-learning, and safe error correction. Technology served as a controlled and private environment where they could manage anxiety at their own pace, reflecting their inward, reflective personality orientation. Their coping strategies highlight the importance of allowing flexible, low-pressure technological pathways that support cognitive clarity and emotional steadiness.

Cross-Group Comparison

The cross-case analysis shows that although extrovert and introvert students used many of the same digital tools such as YouTube, TikTok, Duolingo, movies, and AI applications their underlying purposes and modes of engagement differed sharply. These differences were shaped by personality-driven affective and cognitive tendencies rather than by the tools themselves.

Extrovert students used technology primarily to create external stimulation and momentum before or during writing. Digital content particularly tutorials, reels, and short videos offered them a sense of activation, quick encouragement, and visible progress. They gravitated toward dynamic, interactive environments that provided immediate examples and rapid feedback, enabling them to regulate anxiety through energy, variety, and external support.

Introvert students used the same technologies in more contained and reflective ways. Instead of seeking stimulation, they preferred quiet, self-paced, and minimally social digital spaces. YouTube and TikTok served as private reference sources for gathering ideas or observing examples, while music and films helped them maintain emotional calm. AI feedback was especially valued for its neutrality, offering a safe space to improve writing without evaluative pressure.

These contrasting patterns show that personality shapes not only the selection of tools but the *function* those tools serve in students' coping processes. Extroverts used technology to energize, while introverts used it to regulate and stabilize. To further clarify how personality differences shape digital coping behavior, Table 2 provides a comparative summary of the technology-mediated strategies used by extrovert and introvert students across key functional dimensions.

Table 2. Comparison of Technology-Mediated Strategies Between Extrovert and Introvert Students

Dimension	Extrovert Students	Introvert Students
Emotional Function	Technology used for stimulation and motivational boost	Technology used for calmness and emotional regulation
Entertainment Media	Films/TikTok used to energize and re-activate writing readiness	Music/films used for relaxation and mental focus
YouTube/TikTok Learning	Tutorials used for active skill-building and confidence	Tutorials used for idea searching and quiet observation
Writing Practice	Blogs, journals, essays for expressive practice	Smaller-scale, reflective practices and reading/viewing
Linguistic Support	Duolingo, grammar videos for reinforcement	Google Translate, vocabulary apps for precision
AI Feedback	Immediate correction for confidence enhancement	Private, non-judgmental feedback to reduce fear
Social Dimension	Comfortable with collaborative or content-driven interaction	Limited collaboration; controlled peer involvement
Personality Mechanism	Reduced anxiety through external activation	Reduced anxiety through internal regulation

The table summarizes how extroverts and introverts differed in their psychological use of technology. The key contrast lies in the *functions* rather than the *tools*: extroverts use technology to gain energy, confidence, and momentum, while introverts use it to achieve clarity, emotional stability, and a protected learning environment. The rows illustrate these contrasts across emotional,

cognitive, and behavioral dimensions without re-explaining details already covered in the narrative. This structure highlights how the same technological resources support distinct coping needs based on personality.

Discussion

The findings of this study demonstrate that extrovert and introvert EFL students draw on technology in markedly different ways to regulate writing anxiety, suggesting that personality traits shape not only emotional and cognitive reactions to writing but also the technological strategies students choose to manage these reactions. This aligns with foundational models of writing as a cognitively and affectively demanding process [1], [2] and supports longstanding claims that writing anxiety emerges from interactions between individual traits, appraisal processes, and contextual demands [3], [9], [30]. Extrovert students in this study tended to use technology as an external source of stimulation, momentum, and rapid corrective input, reflecting the broader literature that describes extroverts as sensation-seeking, socially oriented, and responsive to high-activation environments [18], [19], [21]. In contrast, introvert students preferred technological practices that supported calmness, privacy, internal reflection, and gradual cognitive processing traits widely documented in personality research [17], [31].

The pattern of extrovert behavior observed reliance on entertainment media to "activate" emotions, heavy use of tutorials to gain quick clarity, and preference for instantaneous feedback suggests that extroverts regulate writing anxiety by increasing external stimulation and reducing uncertainty. These results are consistent with studies linking linguistic difficulty and test-related cognitive tension to heightened foreign language anxiety [10], [12], [13]. They also echo research showing that extroverts often benefit from environments that provide concrete examples, verbal modeling, and collaborative or interactive tasks [22], [23]. The present findings extend this understanding by demonstrating that technology now acts as a substitute for these socially engaging conditions: platforms such as YouTube and TikTok deliver the dynamic, example-rich input that reduces extroverts' linguistic insecurity, while AI tools offer immediate correction that mitigates fears associated with accuracy and form an effect supported by recent evidence on automated writing evaluation improving confidence and reducing anxiety [26], [27]. Thus, for extrovert learners, technology mediates anxiety primarily by energizing emotional states and simplifying cognitive load.

For introvert students, however, the findings portray a different regulatory pathway. Their anxiety was more closely tied to evaluative pressure particularly from teachers aligning strongly with previous studies identifying fear of negative evaluation as a dominant factor among anxious EFL writers [11], [14], [42]. Introverts responded to this pressure by selecting low-stimulus, self-paced tools such as quiet music, films, vocabulary applications, and step-by-step tutorials that they could engage with independently. Their preference for AI was driven not by a need for motivation but by the desire for non-judgmental, private, corrective feedback, a pattern resonant with findings on self-regulated writing practices and the role of emotionally safe feedback environments [6], [43], [44]. Introverts' reliance on technology for internal regulation reflects theoretical models of stress and coping which argue that individuals manage anxiety based on their appraisal of control and threats [15], [16]. When teacher evaluation is perceived as threatening, non-human feedback AI, translation tools, grammar checkers becomes a psychologically safer alternative. This study

therefore extends coping-strategy research [29], [33] by showing that personality determines not only which strategies students use, but *why* those strategies are effective.

Notably, this study contributes conceptually to L2 and FL writing research by revealing that technology does not function uniformly across learners; instead, its affordances interact with personality dispositions to shape anxiety management. This resonates with emerging scholarship on the increasingly individualized nature of digital learning environments [28] and supports claims that emotional experiences in language learning both anxiety and enjoyment are deeply tied to individual differences [4], [34]. While previous work has documented the causes of writing anxiety and coping strategies among EFL learners [10], [45], [46], the current study advances the field by illustrating how the same technological tools serve different psychological functions for extrovert versus introvert writers. Extroverts use technology to amplify energy and reduce performance uncertainty; introverts use it to minimize threat and ensure emotional stability.

Overall, these findings highlight the importance of integrating personality-sensitive and technology-informed approaches into writing pedagogy. Instructors should recognize that extrovert students may benefit from interactive, multimedia-enhanced scaffolding, whereas introvert students may thrive with private, self-paced, low-pressure digital spaces. Such differentiation aligns with Hyland's [32] call for methodological attention to individual variation in L2/FL writing and points toward pedagogical practices that more effectively address the affective dimensions of writing. By situating writing anxiety within a multidimensional framework combining cognitive theories of composing [1], affective theories of anxiety [30], appraisal theories of emotion [16], and personality research [17], [21] this study offers a richer and more nuanced understanding of how EFL learners navigate the emotional challenges of writing in digitally mediated environments.

CONCLUSION

This study demonstrates that technology-mediated coping strategies for English writing anxiety are deeply shaped by students' personality traits. Extrovert and introvert EFL learners drew on similar technological resources such as YouTube tutorials, social media videos, writing apps, and AI tools but activated them for different psychological functions. Extroverts used technology to generate stimulation, boost motivation, and obtain rapid clarity, while introverts used it to create emotional safety, regulate cognitive load, and reduce the pressure of teacher evaluation. These distinct patterns show that digital tools are not neutral supports; rather, their effectiveness depends on how they interact with learners' dispositional tendencies and affective needs. The findings also expand current understandings of L2/FL writing anxiety by illustrating how technology serves as both an affective and cognitive scaffold. Extroverts benefited from high-energy digital input and immediate feedback, aligning with research on their responsiveness to interaction and stimulation. Introverts, conversely, benefited from quiet, self-paced environments and non-judgmental, AI-assisted feedback, reflecting their need for autonomy and lower-stimulation conditions. This personality-sensitive interpretation of technological coping offers a new direction for writing pedagogy, suggesting that effective support systems must account for emotional styles as much as linguistic skill. By integrating personality theory, writing anxiety literature, and emerging research on digital learning, this study shows that technology now functions as a personalized regulatory system that helps learners navigate the emotional complexity of academic writing. Addressing writing anxiety, therefore, requires pedagogical designs that are flexible, individualized, and sensitive to both

cognitive and affective diversity. Future research should explore how these personality–technology dynamics evolve across proficiency levels, genres, and digital platforms, especially as AI becomes increasingly embedded in writing instruction.

LIMITATIONS

This study has several limitations that should be considered when interpreting the findings. The qualitative sample, although balanced between extrovert and introvert students, was relatively small and drawn from a single English Language Education Study Program, which may restrict the transferability of the results to broader EFL populations. The analysis relied exclusively on semi-structured interviews, making the data susceptible to recall bias and socially desirable responses, especially regarding private emotional experiences and personal technology use. Furthermore, because digital writing environments particularly AI-assisted tools continue to evolve rapidly, the coping patterns identified here reflect the technological context at the time of data collection; future longitudinal research is needed to examine how students' strategies may shift alongside emerging digital affordances.

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AUTHOR CONTRIBUTION

I.W.B. conceptualized the study, designed the methodology, conducted the interviews, analyzed the qualitative data, and led the manuscript drafting process. N.B. supervised the research design, provided methodological guidance, contributed to the refinement of the analytical framework, and critically revised the manuscript for intellectual content. S.M. assisted with data validation, thematic coding reliability checks, and contributed to the interpretation of the findings. R.T.D. supported

participant recruitment, managed ethical and administrative procedures, and contributed to proofreading and structural revision of the manuscript. All authors reviewed and approved the final version of the manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

The authors employed ChatGPT (OpenAI) to help with language development, clarity enhancement, and academic prose structure. Following the use of the tool, the authors carefully examined, confirmed, and revised all content to guarantee correctness, conformity to ethical scientific standards, and alignment with the study's conclusions. The content of this publication is entirely the responsibility of the authors.

REFERENCES

[1] Flower, L., & Hayes, J. R. (1981). A cognitive process theory of writing. *College Composition and Communication, 32*(4), 365. https://doi.org/10.2307/356600

[2] Silva, T. (1993). Toward an understanding of the distinct nature of L2 writing: The ESL research and its implications. https://doi.org/10.2307/3587400

[3] Cheng, Y. (2002). Factors associated with foreign language writing anxiety. *Foreign Language Annals, 35*(6), 647-656. https://doi.org/10.1111/j.1944-9720.2002.tb01903.x

[4] MacIntyre, P. D., & Gardner, R. C. (1991). Methods and results in the study of anxiety and language learning: A review of the literature. *Language Learning, 41*(1), 85-117. https://doi.org/10.1111/j.1467-1770.1991.tb00677.x

[5] MacIntyre, P. D., & Gardner, R. C. (1991). Language anxiety: Its relationship to other anxieties and to processing in native and second languages. *Language Learning, 41*(4), 513-534. https://doi.org/10.1111/j.1467-1770.1991.tb00691.x

[6] Huerta, M., Goodson, P., & Beigi, M. (2017). Graduate students as academic writers: Writing anxiety, self-efficacy, and emotional intelligence. *Higher Education Research and Development, 36*(4). https://doi.org/10.1080/07294360.2016.1238881

[7] Gregersen, T., & Horwitz, E. K. (2002). Language learning and perfectionism: Anxious and non-anxious language learners' reactions to their own oral performance. *The Modern Language Journal, 86*(4), 562-570. https://doi.org/10.1111/1540-4781.00161

[8] Pekrun, R. (2006). The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. *Educational Psychologist Review, 18*(4), 315-341. https://doi.org/10.1007/s10648-006-9029-9

[9] Daly, J. A., & Miller, M. D. (1975). The empirical development of an instrument to measure writing apprehension. *Research in the Teaching of English, 9*(3), 242-249. https://doi.org/10.58680/rte197520067

[10] Rezaei, M., & Jafari, M. (2014). Investigating the levels, types, and causes of writing anxiety among Iranian EFL students: A mixed method design. *Procedia - Social and Behavioral Sciences, 98*, 1545-1554. https://doi.org/10.1016/j.sbspro.2014.03.577

[11] Wahyuni, D., Oktavia, W., & Marlina, L. (2019). Writing anxiety among Indonesian EFL college students: Levels, causes, and coping strategies. *Lingua Cultura, 13*(1), 67-74. https://doi.org/10.21512/lc.v13i1.5239

[12] Fitriani, N. (2022). EFL students' perceptions of the causes of scientific writing anxiety.

IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature, 10(1), 287-299. https://doi.org/10.24256/ideas.v10i1.2637
[13] Iksan, M., Palangngan, S. T., & Nur, S. (2023). Students' anxiety in learning English writing in higher education. *Journal of Applied Studies in Language, 7*(1), 8-14. https://doi.org/10.31940/jasl.v7i1.8-14
[14] Jawas, U. (2019). Writing anxiety among Indonesian EFL students: Factors and strategies. *International Journal of Instruction, 12*(4), 733-746. https://doi.org/10.29333/iji.2019.12447a
[15] Lazarus, R. S. (1984). *Stress, appraisal, and coping.* Springer.
[16] Lazarus, R. S. (1991). *Emotion and adaptation.* Oxford University Press. https://doi.org/10.1093/oso/9780195069945.001.0001
[17] Cain, S. (2012). *Quiet: The power of introverts in a world that can't stop talking.* Crown Publisher.
[18] Lucas, R. E., & Diener, E. (2001). Understanding extraverts' enjoyment of social situations: The importance of pleasantness. *Journal of Personality and Social Psychology, 81*(2), 343-356. https://doi.org/10.1037/0022-3514.81.2.343
[19] McCrae, R. R., & Costa, P. T. (1997). Personality trait structure as a human universal. *American Psychologist, 52*(5), 509-516. https://doi.org/10.1037/0003-066X.52.5.509
[20] Dewaele, J. M. (2007). The effect of multilingualism, sociobiographical, and situational factors on communicative anxiety and foreign language anxiety of mature language learners. *International Journal of Bilingualism, 11*(4), 391-409. https://doi.org/10.1177/13670069070110040301
[21] Dewaele, J. M., & Furnham, A. (1999). Extraversion: The unloved variable in applied linguistic research. *Language Learning, 49*(3), 509-544. https://doi.org/10.1111/0023-8333.00098
[22] Boroujeni, A. A. J., Roohani, A., & Hasanimanesh, A. (2015). The impact of extroversion and introversion personality types on EFL learners' writing ability. *Theory and Practice in Language Studies, 5*(1), 212. https://doi.org/10.17507/tpls.0501.29
[23] Kafryawan, W. (2020). The influence of extroversion personality towards EFL learners' writing skills. *Utamax: Journal of Ultimate Research and Trends in Education, 2*(3), 94-100. https://doi.org/10.31849/utamax.v2i3.5325
[24] Zainuddin, Z. (2016). The impact of personality: Extrovert vs. introvert on the ability in syntax in essay writing. *Studies in English Language and Education, 3*(2), 158-169. https://doi.org/10.24815/siele.v3i2.4963
[25] Hz, B. I. R. (2023). Writing anxiety in EFL students: Personality traits perspective. *ELT Echo: The Journal of English Language Teaching in Foreign Language Context, 8*(2), 160. https://doi.org/10.24235/eltecho.v8i2.15245
[26] Wei, P., Wang, X., & Dong, H. (2023). The impact of automated writing evaluation on second language writing skills of Chinese EFL learners: A randomized controlled trial. *Frontiers in Psychology, 14.* https://doi.org/10.3389/fpsyg.2023.1249991
[27] Ghane, M. H., Razmi, M. H., Dehghanpoor, F., & Nematollahi, R. (2024). The impact of written corrective feedback on students' writing performance, self-efficacy, and anxiety. https://orcid.org/0000-0002-0891-8831
[28] Godwin-Jones, R. (2023). Emerging spaces for language learning: AI bots, ambient intelligence, and the metaverse. *Language Learning & Technology, 27*(2). https://doi.org/10.64152/10125/73501
[29] Santri, M., Ikhsanudin, & Rezeki, Y. S. (2022). Student's strategies in coping with English writing anxiety. *Journey: Journal of English and Pedagogy, 5*(2), 160-168. https://doi.org/10.33503/journey.v5i2.552
[30] Horwitz, E. K. (2001). Language anxiety and achievement. *Annual Review of Applied Linguistics, 21*, 112-126. https://doi.org/10.1017/S0267190501000071
[31] Jung, C. G. (1971). *Psychological types* (Bollingen Series XX, Vol. 6). Princeton University

Press.
[32] Hyland, K. (2016). Methods and methodologies in second language writing research. *System, 59*, 116-125. https://doi.org/10.1016/j.system.2016.05.002
[33] Kondo, D. S., & Ying-Ling, Y. (2004). Strategies for coping with language anxiety: The case of students of English in Japan. *ELT Journal, 58*, 258-265. https://doi.org/10.1093/elt/58.3.258
[34] Dewaele, J.-M., & MacIntyre, P. D. (2014). The two faces of Janus? Anxiety and enjoyment in the foreign language classroom. *Studies in Second Language Learning and Teaching, 4*(2), 237-274. https://doi.org/10.14746/ssllt.2014.4.2.5
[35] Wulandari, D. S. (2017). Extrovert and introvert students in speaking ability of English department at IAIN Palangka Raya. State Islamic Institute of Palangka Raya, Palangka Raya.
[36] Cheng, Y. (2004). A measure of second language writing anxiety: Scale development and preliminary validation. *Journal of Second Language Writing, 13*(4), 313-335. https://doi.org/10.1016/j.jslw.2004.07.001
[37] Zhang, H. (2011). A study on ESL writing anxiety among Chinese English majors—Causes, effects, and coping strategies for ESL writing anxiety. *Kristiantad*.
[38] Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications, Inc. www.papyruspub.com
[39] Barrett, P. T., Petrides, K. V., Eysenck, S. B. G., & Eysenck, H. J. (1998). The Eysenck personality questionnaire: An examination of the factorial similarity of P, E, N, and L across 34 countries. *Personality and Individual Differences, 25*(5), 805-819. https://doi.org/10.1016/S0191-8869(98)00026-9
[40] Velicer, W. F., & Stevenson, J. F. (1978). The relation between item format and the structure of the Eysenck personality inventory. *Applied Psychological Measurement, 2*(2), 293-304. https://doi.org/10.1177/014662167800200210
[41] Guest, G., & Fleming, P. (2015). Mixed methods research. In *Public Health Research Methods* (pp. 581-614). SAGE Publications, Inc. https://doi.org/10.4135/9781483398839.n19
[42] Al-Shboul, Y., & Huwari, I. F. (2015). The causes of writing apprehension through students' perspective. *Journal of Language Teaching and Research, 6*(3), 535-544. https://doi.org/10.17507/jltr.0603.08
[43] Hwang, S. (2025). The interplay of mindset, feedback perception, and academic emotion regulation in undergraduates' self-regulated writing ability. *Education Sciences, 15*(7). https://doi.org/10.3390/educsci15070804
[44] Amani, N., & Bisriyah, M. (2025). University students' perceptions of AI-assisted writing tools in supporting self-regulated writing practices. *IJELTAL (Indonesian Journal of English Language Teaching and Applied Linguistics, 10*(1), 91. https://doi.org/10.21093/ijeltal.v10i1.1942
[45] Syarifudin. (2020). Survey on EFL students' writing anxiety: Level, types, and causes. *Eralingua: Jurnal Pendidikan Bahasa Asing dan Sastra, 4*(2), 122. https://doi.org/10.26858/eralingua.v4i2.13925
[46] Salikin, H. (2019). Factors affecting male and female Indonesian EFL students' writing anxiety. *Indonesian Journal of Applied Linguistics, 9*(2), 316-323. https://doi.org/10.17509/ijal.v9i2.20229