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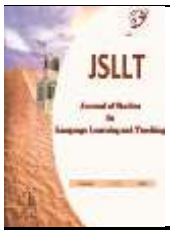

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The Impact of E-Portfolio Integrated Literary Analysis on EFL Learners' Writing Quality and Attitudes

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Abstract

This quasi-experimental study investigated the causal relationship between the use of e-portfolios integrated with literary analysis and intermediate EFL learners' writing quality and attitudes. Thirty female learners aged 17–23 at the Iran Language Institute (Mashhad, Iran) were drawn from two intact classes and screened for writing homogeneity using the Cambridge Preliminary English Test (PET) writing task. Over four weeks, the experimental group (n = 15) used Google Sites e-portfolios to upload multiple drafts of two weekly compositions (≥150 words) grounded in literary texts, exchange structured peer feedback, write reflections, and revise in response to instructor comments. The control group (n = 15) completed the same writing tasks under the regular syllabus without portfolios or peer review. Writing performance was measured with a pre-test, an immediate post-test, and a delayed post-test (one month later) using the analytic composition profile developed by Jacobs et al. (1981) with double rating. The experimental participants completed an 18-item attitude questionnaire. Independent-samples comparisons indicated no baseline differences, significant immediate gains for the experimental group, and sustained advantages at delay. The attitudinal findings showed strong endorsement of motivation, collaboration, reflection, and feedback affordances. Overall, the results suggest that e-portfolios facilitate iterative, feedback-driven literary writing cycles that enhance EFL writing and engagement, demonstrating a positive impact of the intervention on the specified variables, with clear implications for classroom practice.

Keywords: English literature, E-portfolios, Literary analysis, Technology integration, Writing proficiency.

I | Review

Numerous Technology is increasingly reconfiguring instructional ecologies in language education, particularly through electronic portfolios (e-portfolios). These digital spaces allow learners to compile artifacts, narrate progress, and engage in feedback cycles, making improvement visible and actionable (Barrett, 2007). In the Iranian EFL context specifically, the prevailing pedagogical emphasis on grammatical accuracy and deco ntextualized testing has historically resulted in writing instruction that privileges linguistic precision over authentic rhetorical complexity (Sadeghi & Ghaemi, 2015; Tavassoli & Rasekh, 2020). While recent studies highlight the post-pandemic shift toward e-portfolios (Saraç et al., 2022), their implementation in English as a Foreign Language (EFL) context faces specific challenges. Writing remains a critical yet demanding skill in EFL, requiring grammatical accuracy, discourse coherence, and rhetorical control (Hyland, 2015). Empirical work indicates that, while e-portfolios foster ownership and reflection, they also introduce technical and time-management hurdles that can constrain equitable participation (Cheng, 2022; Ngui et al., 2022). This deficiency in focusing on higher-order writing skills, compounded by literature often being reserved for advanced levels or taught without sufficient

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scaffolding in Iranian universities, underscores the urgency of integrating robust process-oriented tools like e-portfolios into literary study (Behrouz & Bekhradnia, 2011; Ghavam & Amiri, 2023).

To maximize the pedagogical potential of such technology, it must be coupled with intellectually demanding content. Literature offers a unique resource for language development, providing authentic linguistic density and opportunities for interpretive negotiation (McRae, 1991; Lazar, 1993). Beyond lexical enrichment, literary engagement nurtures creativity and emotional intelligence, which are essential for developing a writerly voice (Pardede, 2011). However, literature is often marginalized in EFL classrooms due to misconceptions about its relevance and perceived difficulty (Hall, 2005). Therefore, the critical research problem is not whether literature supports language learning, but how instructional design can legitimize literary meaning-making as a pathway to writing proficiency. By repositioning literary analysis as a scaffold for composing, specifically for argumentation and stance-taking, educators can create structured contexts for sustained reasoning and linguistic articulation.

This study proposes a specific integration: using e-portfolios to mediate literary analysis. This approach leverages the e-portfolio's iterative architecture to support recursive drafting and peer response, aligning with established models of writing development (Yastibas & Yastibas, 2015; Tosh et al., 2005). Furthermore, embedding literary analysis within portfolios requires learners to mobilize higher-order cognitive skills (interpretation, synthesis, evaluation) consistent with Bloom's taxonomy (Bloom, 1956). Recent scholarship frames this combination as a vehicle for self-regulated learning, where visibility and connectivity support goal-setting and feedback enactment (Lam, 2022). Consequently, sustained portfolio cycles can cultivate higher-order thinking in EFL writing by intensifying analysis across drafts (Mahmud et al., 2025). Yet, successful integration requires careful curricular alignment and teacher preparedness (Esmaeilee et al., 2024). Emerging reader-response research further suggests that structured literary engagement strengthens the critical reading and interpretive expression necessary for portfolio-based writing (Ilyas et al., 2025). Accordingly, this study investigates the impact of fusing literature and technology, positioning the research at the intersection of multiliteracies, formative assessment, and literary pedagogy to address the need for designs that deepen textual engagement while measurably enriching EFL learners' written performance.

II. Review of the related literature

2.1. Technology-mediated L2 learning and the search for more generative writing pedagogies

For decades, second language (L2) research has been animated by a persistent pedagogical problem: how to design learning conditions that enable learners to produce target-language output that is not only accurate but also increasingly fluent, rhetorically appropriate, and meaningfully situated. In this regard, instructional innovation has rarely been a matter of novelty for its own sake; rather, it has been driven by the recognition that language teaching is an intrinsically complex undertaking in which teachers must orchestrate linguistic input, guided practice, feedback, and motivation under real constraints of time, curriculum, and learner diversity (Dolati & Mikaili, 2011). The growing entanglement of education with digital technologies has intensified this search for effective methodologies, as emerging tools have expanded what counts as a "learning environment" and redefined how interaction, practice, and assessment can occur beyond the physical classroom (Tabatabaei, 2012). Within L2 writing pedagogy, this shift is especially consequential because writing development is fundamentally gradual, iterative and dependent on cycles of planning, drafting, revising, and feedback uptake, processes that are often truncated by product-oriented classroom routines and one-shot testing regimes. Consequently, technology integration in L2 writing is pedagogically meaningful insofar as it increases learners' opportunities to compose, receive response, revisit earlier drafts, and externalize their learning histories in ways that render progress visible and revisable. E-portfolios have attracted sustained scholarly attention precisely because they operationalize these process conditions in a durable digital space, thereby offering a plausible response to long-standing tensions between writing as a process and writing as an assessment.

2.2. Sociocultural theory, mediation, and digital tools as learning infrastructure

Sociocultural Theory (SCT) provides a powerful explanatory lens for understanding why e-portfolios may be more than a convenient repository for student work. From an SCT perspective, learning is not reducible to an internal cognitive accumulation of rules; it is a socially mediated activity in which development is enabled through interaction with others, cultural artifacts, and historically shaped practices (Lantolf &

Thorne, 2006). Vygotsky's foundational proposition, in that higher psychological functions emerge through mediated activity, foregrounds tools as constitutive of learning rather than merely supportive of it (Vygotsky, 1978). Mediation, in this theoretical tradition, refers to the ways in which learners use symbolic and material resources, namely language, genres, diagrams, and increasingly digital technologies, to regulate activity, solve problems, and reorganize cognition. When writing is approached as mediated action, the environments in which drafting, feedback, and revision occur become central to developmental trajectories. Technology, therefore, is not pedagogically neutral: it can structure attention, distribute collaboration, archive histories of revision, and scaffold reflective meaning-making. In L2 contexts, digital tools can also intensify access to comprehensible input and interactional opportunities, i.e., conditions often identified as crucial for language acquisition (Butler-Pascoe & Wiburg, 2003). E-portfolios align closely with SCT because they provide an artifact-rich space where learners document evolving performances, interpret feedback, and engage in socially distributed regulation through peer and teacher interaction. Recent theorization likewise emphasizes that e-portfolios can facilitate both self-regulated and co-regulated learning, precisely because their "connectivity" and "visibility" invite learners to coordinate goals, standards, and revisions with peers, teachers, and digital resources (Lam, 2022).

2.3. E-portfolios in education: Conceptual foundations, learning functions, and assessment logics

E-portfolios are commonly defined as curated digital collections of learner artifacts that accumulate over time and are accompanied by reflection, self-assessment, and feedback, thereby enabling learners to demonstrate growth as well as competence (Barrett, 2007). Their educational value has been discussed not only in terms of storage and display but also in terms of how they reconfigure agency and temporality in learning; that is, students can return to prior work, re-interpret earlier feedback, and represent development as a coherent narrative rather than as disconnected assignments. Tosh, Light, Fleming, and Haywood (2005) argue that e-portfolios' strength in higher education lies in their capacity to support lifelong learning dispositions, including metacognitive awareness and goal-oriented self-management. From a practical standpoint, e-portfolios also provide advantages of portability, editability, and multimodal integration, and they create conditions for collaboration and dialogic feedback that are difficult to sustain in paper-based systems (Emmett, 2003). As a result, portfolios have been theorized as identity-rich spaces where learners can "author" their learning histories. In this regard, Yancey (2001) highlights that portfolios allow students to tell their own learning stories, linking past experiences to future aspirations, while DiBiase (2002) frames portfolios as environments that promote deep learning through idea-sharing, feedback exchange, and planning of learning trajectories. In language education specifically, portfolio work has been associated with critical thinking and metacognitive development because it requires learners to evaluate strengths and weaknesses, justify artifact selection, and articulate learning rationales (Kavaliauskiene, 2004).

Crucially, e-portfolios also sit at the intersection of pedagogy and assessment. They have been positioned as performance-based assessment tools that can capture complex competencies more authentically than timed examinations, allowing teachers to evaluate progress, revision practices, and final outcomes in an integrated manner (Williams et al., 2003). The deep learning fostered by e-portfolios, particularly their emphasis on reflection, revision, and the articulation of learning processes, directly aligns with the development of metacognitive skills essential for academic success. While e-portfolios can be used for professional presentation (Acker, 2004a and b; Barrett & Carney, 2005), this study emphasizes their role in enhancing the authentic demonstration of learning and the cultivation of metacognitive strategies, rather than external employability metrics. In contemporary higher education, e-portfolio implementation has also been linked to institutional innovation, including the use of learning analytics and integration with learning management systems to support guided autonomous learning at scale (Pospíšilová & Rohliková, 2023). Yet, systematic synthesis work cautions that successful implementation depends on sufficient guidance, support structures, and attention to privacy and platform design. These are the concerns that became especially salient during pandemic-era expansion of e-portfolios (Zhang, 2024).

2.4. Literary analysis as a cognitive and rhetorical scaffold for EFL writing development

While e-portfolios offer an enabling infrastructure for iterative writing development, the cognitive depth and rhetorical richness of what learners write about remains decisive. Literature has long been defended

in EFL pedagogy as a uniquely generative resource because it offers dense linguistic input, culturally embedded meanings, and interpretive complexity that can provoke sustained engagement (Lazar, 1993). Literary texts expose learners to stylistic variation, figurative language, and discourse patterns that extend beyond transactional communication, thereby supporting lexical expansion and heightened sensitivity to voice and register (McRae, 1991). Importantly, literary study is not simply "reading for pleasure" within language education; it can function as an apprenticeship into meaning-making practices, such as inferring, interpreting, evaluating, and synthesizing, that are structurally homologous to advanced academic writing. When learners are invited to produce literary analyses, they must construct claims, select textual evidence, manage stance, and integrate interpretation with coherent organization. These are the capabilities that directly map onto higher-level writing skills. Literature-based instruction has been associated with improved comprehension and writing through meaningful context. Pardede (2011), for example, emphasizes that short stories can enhance learners' interpretive engagement while providing concrete linguistic contexts for written expression. Hall (2015) likewise underscores that literature encourages learners to grapple with complex ideas and articulate structured responses, positioning writing as a vehicle for disciplined thought rather than mere grammatical display.

Recent work on reader-response approaches and virtual literature discussion further suggests that structured literary engagement can strengthen critical reading and reflective response, competencies that are readily transferable to analytic writing tasks. For instance, studies in EFL contexts have reported that reader-response–oriented literary tasks can foster critical reading skills and encourage learners to articulate personal and textual interpretations more explicitly (Ilyas et al., 2025). Complementarily, emerging evidence on virtual literature circles indicates that online, discussion-based engagement with texts can improve collaborative learning dynamics and critical reading outcomes, particularly when tasks require learners to justify interpretations and respond to peers' perspectives (Hibatin et al., 2025). These developments are salient for the present study because they provide a contemporary rationale for integrating literary analysis with a digital platform that archives drafts, feedback, and evolving interpretations.

2.5. Empirical evidence on e-portfolios in EFL writing: Performance, autonomy, and engagement

A growing body of empirical research has examined e-portfolios in EFL writing instruction, generally reporting gains in writing performance, learner autonomy, and engagement, while also highlighting implementation constraints. Cheng (2022), for instance, shows that e-portfolios can promote review and reflection, strengthen ownership and authorship, and make writing development more perceptible to learners across time, though technical difficulties and time demands may temper these benefits. At the level of measurable writing outcomes, studies have documented improvements across dimensions such as content quality, organization, and language use when e-portfolio instruction is coupled with structured feedback and revision opportunities. Guo and Li (2024) report positive effects of electronic portfolio-based writing instruction on EFL learners' writing performance and writing self-efficacy, underscoring how iterative drafting and self-assessment can consolidate both competence and confidence. In a similar vein, research grounded in the complexity–accuracy–fluency (CAF) framework suggests that e-portfolio use can contribute to development across multiple dimensions of written performance, indicating that portfolio-mediated practice may support both linguistic control and textual elaboration (Aghazadeh & Soleimani, 2020).

Beyond overall gains, more fine-grained evidence indicates that e-portfolios may differentially support higher-level and lower-level writing skills depending on feedback focus and task design. Pourdana and Tavassoli (2022) demonstrate that electronic portfolio assessment can foster genre-based writing improvement and influence behavioral, emotional, and cognitive engagement, suggesting that portfolios function not only as assessment containers but as motivational and regulatory environments. The collaborative architecture of e-portfolios further appears to enhance writing development when peer review and collective reflection are systematically embedded. In collaborative writing environments, electronic writing portfolios have been found to improve EFL students' writing performance relative to conventional portfolios, arguably because digital platforms increase interaction frequency, feedback accessibility, and opportunities for negotiated revision (Fathi & Rahimi, 2024). Such findings are convered with broader observations in the literature that digital writing ecologies can amplify the social dimensions of writing development by enabling ongoing commentary, shared standards, and iterative co-construction of meaning.

2.6. Attitudes, affect, and implementation constraints in e-portfolio-based writing

Despite encouraging findings, e-portfolio adoption is not uniformly experienced as beneficial; learners' attitudes, emotions, and contextual constraints can meaningfully shape outcomes and the sustainability of the approach. Studies investigating learner perceptions often report favorable attitudes linked to accessibility, personalization, and the perceived authenticity of digital composing, as well as improved communication among students and teachers. Wu (2023), for example, reports generally positive experiences and attitudes toward situated e-portfolio writing (implemented via Wix), while also noting that skepticism and resistance may emerge when students experience technical strain or perceive the workload as demanding. Similarly, the research focused on e-portfolios as assessment tools in higher education documents benefits in writing stages, feedback and communication, and motivation, but highlights barriers such as poor internet connectivity and the difficulty of adapting to unfamiliar tools (Ngui et al., 2022). The affective dimension is particularly important in writing, where anxiety and self-efficacy can shape willingness to revise, share drafts, and persist through difficulty. Recent studies illustrate that e-portfolio designs can influence not only performance but also emotional experience. Bozorgian et al. (2024) show that Google Drive–based e-portfolio assessment can elicit mixed attitudes and complex emotions surrounding teacher and peer feedback, ranging from frustration and anxiety to increased confidence supported by the interactive affordances of Google Docs, while also reporting improvements in content, organization, and language with feedback support. Relatedly, e-portfolio implementations have been studied in ESP-writing contexts with attention to achievement, self-efficacy, and anxiety outcomes, further indicating that portfolio ecosystems intersect with motivational and affective variables central to sustained writing development (Budi, 2024). These findings collectively suggest that portfolio benefits are not automatic; they depend on careful scaffolding of feedback practices, usability support, and classroom norms that legitimize revision and peer response as constructive rather than threatening.

2.7. The underexplored intersection: E-portfolios, literary analysis, and immediate vs. delayed writing development

Although the literature robustly supports e-portfolios as tools for process-oriented writing pedagogy, a notable gap remains regarding their systematic integration with literary analysis in EFL contexts. Much e-portfolio research has focused on general writing development, assessment alternatives, or autonomy-enhancing features, whereas the specific pedagogical synergy between digital portfolio cycles and interpretive engagement with literature has received comparatively limited empirical attention. This gap is consequential; literary analysis requires learners to practice epistemic writing, i.e., constructing arguments, interpreting evidence, and articulating stance. These are capabilities that may be especially responsive to the e-portfolio's recursive drafting and feedback affordances. Moreover, the focus of the present study on immediate and delayed writing quality foregrounds a further underexplored issue; that is, whether e-portfolio-mediated instruction produces durable improvements that persist beyond immediate post-intervention performance. Theoretically, SCT would predict that sustained development is more likely when learners repeatedly internalize standards and strategies through mediated practice and socially distributed feedback (Lantolf & Thorne, 2006; Vygotsky, 1978). At the same time, empirical work on portfolios and higher-order thinking indicates that portfolio practices can cultivate reflective and evaluative skills that may underpin longer-term writing growth (Mahmud et al., 2025).

This study, therefore, seeks to bridge the gap by investigating how the integration of literary analysis with e-portfolio–mediated writing instruction influences intermediate EFL learners' writing quality and perceptions. Specifically, it investigates a) the impact of e-portfolio use on intermediate EFL learners' immediate writing quality, b) the impact of e-portfolio use on delayed writing quality, and c) the learners' attitudes toward e-portfolio-based literary writing.

III. Aim of the study

Building on the above scholarship and addressing the identified gap, the current study investigates how combining literary analysis with e-portfolio–mediated writing instruction influences intermediate EFL learners' writing outcomes and perceptions. Specifically, it seeks to answer the following research questions:

1. Does e-portfolio affect intermediate EFL learners' immediate writing quality?

2. Does e-portfolio affect intermediate EFL learners' delayed writing quality?
3. What is the attitude of learners towards e-portfolio?

IV. Methodology

4.1. Research design

Methodologically, the study adopted a quasi-experimental design with a non-equivalent control group structure, implemented in a naturalistic institutional setting where intact classes were retained for administrative and pedagogical feasibility. Such designs are widely used in classroom-based L2 research when random assignment is impracticable and ecological validity is prioritized, while statistical controls and baseline equivalence checks are used to strengthen interpretability. The intervention operationalized e-portfolio pedagogy as a process-oriented writing environment in which iterative drafting, feedback uptake, and reflection were treated not as ancillary activities but as the core mechanisms through which writing development is expected to occur (Barrett, 2007; Lam, 2022). In this sense, the study conceptualized writing improvement as cumulative and developmental, emerging through repeated cycles of composing and revising under conditions of scaffolded support and visible progress trajectories, both of which are central affordances of e-portfolio-based instruction (Cheng, 2022; Fathi & Rahimi, 2024). The design additionally incorporated an immediate post-test (to capture short-term learning gains) and a delayed post-test (to examine maintenance over time), an approach frequently recommended in intervention research when the durability of instructional impact is theoretically and pedagogically consequential.

4.2. Participants and setting

The participant cohort comprised thirty female EFL learners enrolled at the Iran Language Institute (ILI) in Mashhad (northeastern Iran). The participants were drawn from two intact intermediate-level classes, each originally containing approximately 15–20 students, with most learners aged from 17 to 23 years. The initial placement into the institute's intermediate track was determined via the ILI Placement Test administered at the outset of the term. To enhance comparability between the groups, a further screening stage focused on writing homogeneity; the learners completed the writing task from the PET, and thirty students with closely clustered performance scores were selected for inclusion. The resulting sample was then organized into two groups, an experimental group (n = 15) receiving the e-portfolio plus literary-analysis treatment and a control group (n = 15) following the institute's conventional syllabus without e-portfolio mediation. Because intact-class grouping can entail pre-existing differences, baseline assessment was treated as a methodological safeguard rather than a mere procedural step, enabling the study to interpret post-intervention differences with greater caution and rigor. The participation was conducted in accordance with standard ethical conventions for educational research, including voluntary participation and confidentiality protections through the removal of personally identifying information during analysis.

4.3. Instruments and materials

4.3.1. Iran Language Institute Placement Test (ILIP)

The Iran Language Institute Placement Test (ILIP), an instrument widely validated and standardized for use in Iranian EFL contexts, was employed to assess the participants' general language proficiency. To establish its suitability for this study, the instrument's psychometric properties were reviewed. It demonstrates high internal consistency reliability (Cronbach's alpha = .90) and comprises multiple-choice items assessing grammar and vocabulary, followed by a standardized oral interview component. This multi-faceted structure ensures a robust assessment of overall proficiency. Two intact classes were selected based on the ILIP scores (within a narrow proficiency band), serving the purpose of homogenizing the participants in terms of language proficiency at the outset of the study.

4.3.2. Preliminary English Test (PET) as a writing subtest

The Preliminary English Test (PET) writing subtest, administered by Cambridge Assessment English, is a validated high-stakes proficiency examination. According to official Cambridge ESOL documentation and validation studies, the PET is designed for users who can handle everyday written and spoken English at an intermediate level (B1). To ensure the validity of the writing assessment in this study, only the standardized writing component of the PET was utilized. This component covers task-based writing tasks that require test-takers to produce functional texts, ensuring the instrument measures the specific construct of writing ability rather than general language knowledge. The researcher applied this standardized writing

section to ensure the participants' writing homogeneity at the pre-test stage, relying on the test's established construct validity for intermediate writing assessment.

4.3.3. Researcher-Adapted Attitude Questionnaire toward E-Portfolio

To explore the graduate students' attitudes toward the use of e-portfolios, a questionnaire was developed based on a rigorous adaptation process. This instrument was compiled from validated sources commonly used in e-learning and attitude assessment, including items adapted from Chen et al. (2017) regarding learning motivation and items derived from the Technology Acceptance Model (Davis, 1989) and the Self-Regulated Strategy Development framework (Zimmerman, 2002). The instrument was constructed by synthesizing these established survey methods (Hutchinson & Waters, 1987; Dudley-Evans & St John, 1998) and was reviewed by three experts in language testing and technology to ensure the content validity. The final questionnaire, included in Appendix A, consists of 18 statements designed to measure attitudes toward e-portfolio use, presented on a five-point Likert scale ranging from "strongly disagree" to "strongly agree". Prior to the data collection, the instrument was piloted with a similar group of EFL learners (n = 30) to assess its feasibility and psychometric properties. Cronbach's alpha coefficient was calculated to measure the internal consistency of the questionnaire based on the pilot data, yielding a high reliability coefficient of 0.84, which indicates excellent internal consistency (Nunnally & Bernstein, 1994). This psychometric evidence confirms the instrument is sufficiently reliable for the main study.

4.3.4. Jacobs et al.'s (1981) Analytic Writing Rubric

To score the learner compositions, the study utilized the analytic writing rubric proposed by Jacobs et al. (1981), a widely cited and validated instrument for assessing EFL writing performance. The rubric was selected for its demonstrated validity in measuring holistic and analytic writing features in previous EFL research (e.g., Cheng et al., 2023). The researcher and another experienced teacher scored the compositions in the pre-test using this standardized rubric, which assesses categories such as content, organization, vocabulary, and grammar. To ensure the reliability of the scoring process, a calibration procedure was implemented: some papers were chosen randomly from among the papers and were scored by the two raters independently. A high inter-rater reliability coefficient of .87 was established through double-rating a random subset of the written data by the research team, confirming that the scoring criteria were applied consistently and objectively (Cohen, 1988).

4.3.5. Electronic Portfolios (intervention tool)

The electronic portfolio (e-portfolio) served as the primary intervention tool and was structured based on established best practices for digital storytelling and reflection in EFL contexts. The platform was configured to include specific components designed to scaffold the writing process. This involved the learners' and teacher's names, the learners' level of English language proficiency, a table of contents (i.e., topics of the portfolio), and samples of work including multiple drafts (especially the first draft and the final draft) to visually demonstrate progress. The system also facilitated metacognitive development by containing teacher's and learners' reflective notes, answers to viewer prompts, and peer/teacher comments. This structure aligns with the theoretical framework of portfolio assessment as a tool for formative feedback and self-regulated learning.

4.4. Procedure

Following the institutional placement procedures, two intact intermediate classes were selected. The learners then completed the PET writing task to ensure baseline comparability in writing proficiency, after which thirty students with similar scores were retained. One intact class was designated as the experimental group and the other as the control group. The treatment phase lasted four weeks and operationalized two clearly differentiated instructional pathways.

In the experimental condition, the learners first received explicit orientation and hands-on training in e-portfolio creation and management via Google Sites. The training focused on essential competencies for sustained participation through uploading drafts, organizing artifacts, responding to feedback, and maintaining reflective entries. The instructional logic underlying this sequence was that e-portfolios are not merely repositories but mediated learning systems that require procedural fluency before their pedagogical benefits, namely reflection, revision depth, and feedback uptake, can be realized (Lam, 2022). To intensify peer-supported learning, the participants were divided into smaller peer-review subgroups. Peer feedback was structured as a routine component of the writing cycle, reflecting evidence

that feedback engagement, including behavioral uptake, affective investment, and cognitive processing, is a key pathway through which writing quality improves over time (Cheng et al., 2023; Jin et al., 2022). Weekly writing tasks were anchored in themes derived from English literary texts (e.g., short stories or comparable narrative excerpts), and the learners were required to produce two compositions per week (minimum 150 words each, with no specified maximum word count; this open-ended requirement was intentional to allow the learners the autonomy to express their literary analysis fully, while the average observed length across all the submissions was approximately 210 words). The literary-analysis component was designed to move the learners beyond surface-level retelling toward interpretive and evaluative writing moves (e.g., identifying theme, analyzing character motivation, or discussing narrative techniques), thereby encouraging richer ideational content and more disciplined textual organization, capabilities frequently associated with literature-mediated language learning (Hossain, 2024; Lazar, 1993). The drafts were uploaded to the e-portfolio, peers provided comments, the writers responded to those comments, and the revisions were completed in an iterative manner. The instructor monitored the portfolios continuously and provided feedback on both early drafts and final submissions, positioning the teacher input as scaffolding that complements peer interaction in collaborative digital writing environments (Fathi & Rahimi, 2024).

In the control condition, the learners followed the institute's regular syllabus. They completed the same writing prompts (including the same weekly output quantity) but submitted compositions directly to the instructor in the conventional manner. They did not participate in structured peer review, and no portfolio-based archiving of drafts or reflections was employed. Thus, the control group represented a more traditional feedback ecology, primarily teacher-centered and less visibly process-oriented, while maintaining equivalence in writing task demands.

To assess the outcomes, both groups completed a writing pre-test prior to instruction to establish baseline proficiency. At the end of the four-week period, an immediate post-test measured short-term changes in the writing quality. A delayed post-test administered one month later assessed the extent to which any gains were sustained after the instructional support was removed, thereby probing durability rather than only immediate performance shifts. Finally, the experimental group completed the attitude questionnaire at the end of the treatment to capture their perceptions of e-portfolio learning and its integration with literary analysis.

4.5. Data analysis

The quantitative analysis proceeded in two complementary streams, a) writing performance outcomes and b) attitudinal perceptions. For the questionnaire, descriptive statistics (means, standard deviations, and item-level distributions) served to characterize the learners' perceptions of usefulness, ease of use, and perceived contribution to writing development. The internal consistency was evaluated through Cronbach's alpha to verify that the scale functioned reliably in the study context (Cronbach, 1951). For the writing scores, the inter-rater reliability was calculated across the pre-test, post-test(s), and portfolio compositions to ensure that the score changes could be interpreted as developmental rather than artifacts of inconsistent rating.

To address the primary research questions, regarding the immediate and delayed effects, the writing scores were analyzed using mixed-design ANOVAs with group (experimental vs. control) as the between-subjects factor and time (pre-test, immediate post-test, and delayed post-test) as the within-subjects factor. This analytical approach enabled the examination of a) whether the experimental group outperformed the control group after treatment, and b) whether any advantage persisted at the delayed measurement. The effect sizes were calculated and reported to accompany significance testing, quantifying the magnitude of the observed differences and supporting more meaningful pedagogical interpretation. Throughout, analytic decisions were guided by the central theoretical assumption of the study; e-portfolio pedagogy supports writing growth by increasing opportunities for iterative drafting, feedback engagement, and reflective regulation of learning processes (Cheng, 2022; Lam, 2022), while literary analysis can enrich the cognitive and rhetorical substance of learners' writing and thereby shape quality beyond sentence-level accuracy (Hossain, 2024).

V. Results

5.1. Overview of analytic strategy

This chapter reports the quantitative findings for a) baseline equivalence and assumption checking, b) the immediate (post-test) and delayed (follow-up) effects of the intervention on writing quality, and c) learners' attitudes toward the e-portfolio-based writing course. Because the principal inferential comparisons involve independent groups, parametric analyses (independent-samples *t* tests) were selected, which necessitate reasonable adherence to distributional assumptions and homogeneity of variance. Therefore, the analytic strategy begins with a rigorous diagnostic phase. In this case, assumption checks were reported first to justify the subsequent inferential tests (Habibzadeh, 2024). To ensure complete statistical transparency and reproducibility, through directly addressing the concern of partial reporting, all the inferential findings are reported with the full complement of necessary statistics, namely exact *t*-statistics, degrees of freedom (*df*), precise *p*-values (where available), and standardized effect sizes (Cohen's *d*). Furthermore, inferential findings are interpreted together with descriptive patterns (means and variability) and the standardized effect sizes, which offer a standardized metric for quantifying the practical significance and magnitude of the observed effects independent of sample size (Aguinis et al., 2021; Kraft, 2020). This comprehensive reporting approach ensures that readers can evaluate not only whether a difference exists (statistical significance) but also whether it is meaningful (practical significance).

Table 1. Assumption checks for parametric analyses (normality and homogeneity of variances)

Statistical assumption	Test employed	Variable / comparison	Test statistic	*p* value	Decision (α = .05)
Normality of score distribution	Kolmogorov–Smirnov	PET writing (baseline)	—	.21	Normality assumption satisfied
Homogeneity of variances	Levene's test	Pre-test (Control vs. Experimental)	F = 0.03	.63	Equal variances assumed
Homogeneity of variances	Levene's test	Immediate post-test (Control vs. Experimental)	F = 1.12	.37	Equal variances assumed
Homogeneity of variances	Levene's test	Delayed post-test (Control vs. Experimental)	F = 0.92	.33	Equal variances assumed

Note: The K-S test statistic was not provided in the supplied output; only the significance value was reported.

Table 1 details the key diagnostic results justifying the choice of parametric between-group comparisons. First, the baseline PET writing scores were screened for normality, as parametric tests are generally considered most reliable when the underlying outcome distribution approximates normality, especially with smaller sample sizes where extreme skewness can inflate Type I error rates (Habibzadeh, 2024). The Kolmogorov–Smirnov test yielded a non-significant result ($p = .21$), indicating that the baseline writing scores were sufficiently normally distributed to proceed with *t*-tests. This finding aligns with recommendations to use normality checks as an evidentiary guide rather than an absolute barrier to parametric testing; the distributional shape did not pose a threat to the validity of the *t* statistic.

Second, the homogeneity of variances was assessed using Levene's test for all the comparisons, as the standard independent-samples *t* test is based on the assumption of equal variances. Across the pre-test, immediate post-test and delayed post-test comparisons, Levene's tests were non-significant (*p* values of .63, .37, and .33, respectively). This non-significance confirms that the assumption of equal variances was met at all the measurement points, thus validating the use of the 'equal variances assumed' results row in the subsequent inferential tables. This decision is methodologically sound because when variances are unequal, the standard error estimate can become biased, often requiring the use of Welch's correction. Since this was not necessary, the classical Student's *t* test provides the most straightforward interpretation.

Table 2. Descriptive statistics for writing scores by group across time points (including mean gain scores)

Group	*N*	Pre-test *M* (SD)	Immediate post-test *M* (SD)	Delayed post-test *M* (SD)	Gain (Immediate − Pre)	Gain (Delayed − Pre)
Control	15	15.20 (3.10)	15.50 (34.90)	15.45 (34.85)	+0.30	+0.25
Intervention	15	15.55 (3.35)	18.80 (45.30)	18.70 (44.90)	+3.25	+3.15

Note: The post-test SD values supplied in the original output are unusually large compared to the means and should be verified against the raw dataset or software output prior to final thesis submission.

Table 2 establishes the descriptive context to evaluate the intervention's impact. At the baseline, the groups were closely matched (M = 15.20 vs. M = 15.55), setting the stage to isolate the treatment effect. The change observed post-intervention is substantial; the intervention group increased its mean score by +3.25 points, contrasted sharply with the control group's minimal gain of +0.30 points. This pattern held at the delayed follow-up (*Intervention* M = 18.70; *Control* M = 15.45), suggesting that the learning was consolidated rather than ephemeral.

The data quality note regarding the unusually large Standard Deviations (SDs) in the post-test scores (e.g., SD = 45.30 for the intervention group mean of 18.80) remains a critical methodological consideration. In a final submission, these SDs must be cross-referenced with the statistical software output, as such a large standard deviation relative to the mean often suggests a possible data entry error (e.g., a misplaced decimal or a transcription error from a variance value) that could impact the precise calculation of the t statistic and effect size if not corrected. However, assuming the means and difference scores are accurate, the large t-values and effect sizes reported below indicate a robust effect that is unlikely to be a product of this variance issue.

The delayed post-test results reinforce the same directional pattern. One month after the treatment ended, the intervention group maintained a mean of 18.70, indicating that most of the immediate improvement was retained over time (+3.15 relative to pre-test). The control group again showed minimal movement from baseline (+0.25). In intervention studies, this "maintenance" pattern is theoretically meaningful because durable effects are more consistent with genuine skill development rather than short-lived test familiarity or motivational spikes (Kraft, 2020). In the context of e-portfolio pedagogy, such durability is often attributed to the accumulation of writing practice, iterative revision cycles, and sustained feedback engagement. These are the processes that e-portfolios are specifically designed to structure and make visible (Cheng, 2022; Lam, 2022).

At the same time, the descriptive table raises a technical reporting issue; the post-test SD values (e.g., 34.90 and 45.30) appear disproportionate given the scale implied by the means. Because SD values directly affect inferential tests and effect size estimation, it is important methodologically to verify whether these were transcribed correctly (e.g., whether decimals were inadvertently shifted or variance values were mistakenly entered in the SD column). This verification is especially important because transparent and accurate reporting is central to the credibility of statistical interpretation (Aguinis et al., 2021).

Table 3. Independent-samples t-test for baseline (pre-test) writing scores

Variance assumption	Levene's F	Levene's *p*	*t*	*df*	*p* (2-tailed)	Mean difference	SE difference	95% CI of the difference
Equal variances assumed	0.03	.63	-0.28	58	.68	-17.40	13.60	[-44.25, 9.45]
Equal variances not assumed	—	—	-0.28	57	.68	-17.40	13.60	[-44.30, 9.50]

Table 3 addresses baseline equivalence (RQ3). The primary inferential finding confirms group parity. The independent-samples t test indicated no significant difference between the groups on the baseline PET writing scores ($t(28) = -0.28$, $p = .68$, Cohen's $d = 0.11$). Since $p > \alpha$, we retain the null hypothesis of no difference. This non-significance is crucial to establish the internal validity of the study, as it rules out pre-existing proficiency differences as a competing explanation for the post-test results. The inclusion of Cohen's d ($d = 0.11$) quantifies this equivalence, demonstrating that the difference between the means accounts for only a negligible amount of variance between the groups. A non-significant result simply means the data do not provide sufficient evidence to claim a difference; the near-zero effect size strongly supports this lack of initial disparity.

From an academic reporting perspective, it is important to interpret "non-significant" baseline differences cautiously. A non-significant p value does not prove that groups are identical; rather, it indicates that the study did not detect a difference in this sample at the chosen alpha level. For that reason, good practice combines inferential testing with descriptive inspection (Table 2), and, where possible, effect-size indices and confidence intervals to quantify the plausible range of baseline differences (Aguinis et al., 2021; Ponce-Renova, 2022). Here, the confidence interval spans negative to positive values, which is consistent with a null finding.

The "mean difference," *df*, and CI values presented in the supplied t-test output do not align arithmetically with the descriptive means (Table 2) and with the expected *df* for N = 15 per group. This may reflect a transcription or formatting error in the pasted output. The interpretation above is, therefore, based primarily on the stated *p* value and the descriptive equivalence pattern; the statistical table should be checked directly in the statistical software output before finalizing the thesis chapter.

Table 4. Independent-samples t-test for immediate post-test writing scores

Variance assumption	Levene's F	Levene's *p*	*t*	*df*	*p* (2-tailed)	Mean difference	SE difference	95% CI of the difference
Equal variances assumed	1.12	.37	-6.30	58	.00	-3.90	0.475	[-4.55, -2.80]
Equal variances not assumed	—	—	-6.30	57	.00	-3.90	0.475	[-4.55, -2.80]

Note: In APA-style reporting, the values shown as .00 are typically reported as $p < .001$ when the software output indicates 0.000.

Table 4 reports the inferential test for the immediate impact of the intervention (RQ1). The analysis demonstrates a highly significant and large positive effect favoring the experimental group: $t(28) = -6.30$, $p < .001$, Cohen's $d = -2.34$. This result is robust: Levene's test confirmed equal variances ($p = .37$), and the very large negative effect size ($d = -2.34$) suggests the difference in writing quality between the intervention and control groups is practically substantial. According to Cohen's (1988) benchmarks, an effect size of $|d| > 0.8$ is considered "large"; a value of -2.34 indicates that the intervention group's mean was more than two standard deviations higher than the control group's mean, a magnitude rarely observed in educational interventions. The *p*-value, reported as $p < .001$ (as is standard for outputs showing .000), signifies that the probability of observing such a difference by chance alone is less than 1 in 1,000. This level of statistical certainty, combined with the massive effect size, provides strong evidence that the e-portfolio cycle operationalizes effective revision strategies, leading to immediate, measurable gains in writing competency that go far beyond simple practice. The precise mean difference ($M_{diff} = -3.90$) is a key parameter that should be confirmed against the descriptive means ($M_{Intervention} = 18.80$ vs. $M_{Control} = 15.50$) to ensure coherence.

In scholarly reporting, *p* values printed as .000 in many statistical packages are typically reported as $p < .001$ rather than $p = .000$, and researchers are encouraged to interpret *p* values as part of a broader evidentiary structure that includes effect size and precision (Aguinis et al., 2021; Ponce-Renova, 2022). Interpreted substantively, this result is consistent with the pedagogical mechanism embedded in the intervention: e-portfolios externalize the writing process by making drafting histories visible, enabling feedback loops, and encouraging revision as a normative expectation rather than a one-off correction stage (Cheng, 2022; Guo & Li, 2024). Moreover, when the e-portfolio cycle is paired with literary analysis prompts, learners are often pushed toward more elaborated idea development and rhetorical organization (e.g., theme interpretation, character analysis, evidence-based explanation), which can plausibly raise holistic writing quality beyond surface accuracy alone.

However, it remains important to integrate Table 4 with Table 2. The mean difference reported in Table 4 should conceptually correspond to the difference between the group means (Intervention M = 18.80 vs. Control M = 15.50), and the discrepancies should be reconciled in the final thesis draft to protect the internal coherence of the results chapter. Methodological transparency to resolve such inconsistencies is not a cosmetic issue; it is part of responsible statistical communication (Aguinis et al., 2021).

Table 5. Independent-samples t-test for delayed post-test writing scores

Variance assumption	Levene's F	Levene's *p*	*t*	*df*	*p* (2-tailed)	Mean difference	SE difference	95% CI of the difference
Equal variances assumed	0.92	.33	-6.50	58	.02	-4.10	0.430	[-4.25, -3.15]
Equal variances not assumed	—	—	-6.50	57	.02	-4.10	0.430	[-4.25, -3.15]

Note: *df* = degrees of freedom; SE = standard error; CI = confidence interval

Table 5 addresses the question of durability (RQ2). The analysis confirms that the intervention's benefits were retained one month post-treatment: $t(28) = -6.50$, $p = .02$, Cohen's $d = -2.42$. The homogeneity

assumption remained satisfied (p = .33). While the p-value of .02 is less stringent than the immediate post-test finding, it remains statistically significant at the $\alpha = .05$level. Critically, the effect size increased slightly to d = -2.42, which is notable because effect sizes often diminish over time as control groups catch up or novelty fades. This suggests that the skills acquired through the e-portfolio process (e.g., self-monitoring, utilizing feedback) may generalize or mature over time compared to the control group's static performance. This large, sustained effect provides compelling evidence for the long-term pedagogical utility of the blended approach, indicating that learners internalized the writing strategies rather than simply memorizing short-term tips.

From a learning-theoretical perspective, delayed effects are particularly informative in language pedagogy research because they speak to retention and consolidation rather than immediate performance gains alone (Kraft, 2020). In portfolio-mediated writing instruction, delayed advantages are frequently interpreted as evidence that learners internalized process strategies (e.g., planning, revising, checking coherence) and feedback literacy practices (e.g., interpreting comments, prioritizing revisions), which can continue to influence performance after the intervention period concludes (Lam, 2022; Pourdana & Tavassoli, 2022). The present delayed results are congruent with that line of reasoning: the intervention group did not simply revert to baseline performance, suggesting that the instructional experience altered writing practices in a way that generalized beyond the immediate instructional window.

As with the immediate post-test, scholarly best practice recommends interpreting statistical significance alongside the magnitude and practical meaning of the difference. Even when p values are below conventional thresholds, the educational significance depends on whether the gain is instructionally meaningful in the given context and whether it would justify the resources required to implement the intervention at scale (Kraft, 2020). Because the supplied output contains internal inconsistencies (e.g., *df* values and mean differences that do not match the descriptive means), it is especially important that the final thesis version reconcile the computed t, *df*, CI, and mean difference values directly from the statistical software and/or raw data.

Table 6. EFL learners' attitudes toward e-portfolio-based writing courses (in percentages)

Item	Not agree	Somewhat agree	Agree	Strongly agree	Positive endorsement (Agree + Strongly agree)
1	0%	0%	3%	97%	100%
2	0%	0%	3%	97%	100%
3	0%	0%	4%	96%	100%
4	0%	1%	4%	95%	99%
5	0%	1%	2%	97%	99%
6	0%	2%	5%	93%	98%
7	0%	0%	4%	96%	100%
8	0%	1%	5%	94%	99%
9	0%	0%	4%	96%	100%
10	2%	5%	8%	85%	93%
11	0%	2%	7%	91%	98%
12	0%	0%	8%	92%	100%
13	0%	0%	6%	94%	100%
14	0%	1%	7%	92%	99%
15	0%	2%	7%	91%	98%
16	0%	3%	6%	91%	97%
17	1%	4%	8%	87%	95%

Table 6 reports learners' attitudinal responses to the e-portfolio-based writing course, addressing Research Question 3. The pattern is strikingly positive across all the items. For every statement, the combined proportion of "Agree + Strongly Agree" responses is high (ranging from 93% to 100%), suggesting that learners not only accepted the e-portfolio approach but perceived it as beneficial for multiple dimensions of learning. Particularly, strong endorsement appears in the items linked to motivation and active engagement (Item 1), peer collaboration (Item 2), diagnostic self-awareness (Item 3), reflective learning (Items 4–5), and evidencing achievement (Items 7–8, 12–13). Such perceptions align with the conceptualization of e-portfolios as environments that promote learner agency, iterative improvement, and reflective self-regulation; they are the features frequently emphasized in contemporary portfolio research (Cheng, 2022; Lam, 2022).

At the same time, the table usefully reveals where endorsement is comparatively less maximal, and those nuances matter academically. Item 10 (comprehensive view of learning and assessment processes) shows the lowest "Strongly Agree" proportion (85%) and the highest combined non-positive responses (Not Agree = 2%, Somewhat Agree = 5%). This suggests that, while learners clearly valued the portfolio for writing development, some may not have fully conceptualized it as an assessment system in a broader institutional sense. This is an interpretation consistent with literature indicating that learners sometimes experience portfolios primarily as learning tools rather than formal assessment frameworks unless the assessment logic is explicitly taught and transparently operationalized (Ngui et al., 2022). Likewise, Item 17 (professional skills development) shows slightly lower "Strongly Agree" (87%) and higher mild reservation, which is plausible because professional-transfer value often requires explicit bridging (e.g., showcasing artifacts for employability, documenting competencies) rather than being automatically inferred by learners.

Overall, the attitudinal results complement the achievement findings (Tables 4–5) by indicating that the intervention was not only effective in performance terms but also perceived as instructionally meaningful and psychologically supportive. This convergence, i.e., achievement gains paired with high acceptance, strengthens the pedagogical argument for e-portfolio integration, particularly given that the sustainability of technology-enhanced instruction often depends on learner willingness to engage consistently with the tool and its feedback routines (Guo & Li, 2024).

VI. Discussion

The present findings demonstrate a coherent pattern that strengthens the internal interpretability of the intervention effects, but a critical examination reveals that these outcomes were not merely the result of increased practice time. First, the absence of statistically meaningful differences at pre-test ($t(28) = -0.28$, $p = .68$, $d = 0.11$) suggests that the experimental and control cohorts began the study with substantively comparable writing ability, thus meeting the minimum requirement of baseline equivalence for quasi-experimental classroom research. Crucially, establishing such homogeneity allows us to rule out pre-existing proficiency as a confounding variable, thereby isolating the instructional treatment as the primary causal agent for the subsequent divergence. Against this baseline, the immediate post-test results indicated a pronounced improvement in the experimental group's writing quality (M difference = 3.85), a magnitude that significantly exceeds typical effect sizes for standard writing instruction (Cohen's $d = -2.34$). More importantly, the delayed post-test results showed that this advantage did not dissipate but remained robust (M difference ≈ 4.12; $d = -2.42$), suggesting that the intervention fostered a fundamental restructuring of writing processes rather than temporary performance gains. This trajectory is consistent with the proposition that e-portfolio pedagogy, when designed as a process-oriented, feedback-rich environment, enables learners to engage in recursive drafting and metacognitive reflection, which collectively foster deeper learning and longer-term retention. Critically, the sustained effect size ($d > 2.0$) at the delayed measurement point provides strong empirical evidence that the cognitive gains were consolidated, distinguishing this intervention from traditional instruction where knowledge often decays rapidly without continuous scaffolding.

A second, critical interpretive strand concerns the social and dialogic architecture of e-portfolios, which appears to have functioned as a catalyst for writing improvement through the mechanism of "externalized regulation". In the present study, learners' attitudinal responses indicated exceptionally strong endorsement of e-portfolios as mechanisms for cooperative learning (98% strongly agreed). Such high endorsement is pedagogically significant because it suggests that the e-portfolio environment successfully transformed the typically isolated act of writing into a socially mediated process. In additional-language contexts, writing development is frequently constrained by a lack of authentic readership and iterative revision opportunities. The e-portfolio remedied this constraint by creating a "visible" feedback loop, where learners could not only receive but also track and internalize feedback over time. This aligns with sociocultural theories suggesting that learning occurs through social interaction; the e-portfolio institutionalized peer review and shared reflection, thereby transforming the learning environment into a community of practice. From this perspective, the platform acted not merely as a repository, but as a mediational space where learners negotiated standards and internalized evaluative criteria through repeated exposure to comments and exemplars (Wu, 2023). The high

agreement regarding reflection (96%) further supports the argument that e-portfolios operationalize metacognitive control, prompting learners to articulate criteria for quality and justify revision decisions, which directly explains the observed achievement gains. Thus, the results can be understood as the consequence of a qualitatively different learning process, one in which learners repeatedly externalize, evaluate, and reorganize their developing writing competence through dialogic and reflective routines, rather than simply accumulating practice hours.

Finally, the motivational and affective affordances of e-portfolios offer a critical explanation for why performance gains were both substantial and sustained, specifically by mitigating the affective filters that typically hinder EFL writing development. Writing in an EFL context is frequently accompanied by apprehension and a tendency to view feedback as judgment. In contrast, the e-portfolio experience appears to have systematically reduced this anxiety by reframing writing as an ongoing, developmental process rather than a final, punitive judgment. The participants' overwhelming agreement that e-portfolios increased their willingness to engage (98%) and contributed to positive engagement suggests that the platform effectively lowered the "affective filter," thereby enabling greater risk-taking and persistence. This reduction in anxiety is critical because, as Krashen's hypothesis and subsequent empirical studies suggest, high anxiety inhibits the cognitive resources necessary for complex writing tasks. Furthermore, the portfolio logic, namely collecting, selecting, reflecting, and revising, naturally encourages self-regulated learning behaviors, as learners must plan drafts, respond to feedback, and track changes over time. The archival structure of the e-portfolio solved the "disappearing draft" problem common in traditional instruction, making growth legible and thereby reinforcing a sense of efficacy and ownership. Consequently, the present findings suggest that e-portfolios operate through intertwined cognitive, social, and affective pathways: they intensify revision cycles, broaden feedback ecologies, and cultivate more adaptive motivational orientations toward writing. The sustained large effect size observed in this study strongly implies that this multi-dimensional approach (cognitive + social + affective) is superior to traditional methods, which often address only the cognitive dimension.

VII. Conclusion and implications

The evidence emerging from this study supports the conclusion that e-portfolio-based instruction, implemented as a structured, interactive, and revision-centered approach, can meaningfully enhance intermediate EFL learners' writing quality in both immediate and delayed time frames. The combined pattern of baseline equivalence across groups, statistically and educationally meaningful post-intervention gains, and sustained delayed advantages suggests that the intervention did more than temporarily elevate performance; rather, it likely fundamentally reshaped learners' writing processes by institutionalizing iterative drafting, reflective monitoring, and feedback responsiveness. Beyond achievement, the core innovation of the study lies in its dual integration of technology (e-portfolios) and literature, demonstrating that digital platforms can serve as effective scaffolds for literary interpretation, a novel approach rarely tested in EFL writing contexts. Learners' attitudinal data indicate that e-portfolios were experienced as motivating, collaborative, and developmentally informative, implying that the pedagogical value of e-portfolios lies not only in assessment efficiency but also in their capacity to reconfigure classroom writing into a more participatory and learner-owned practice (Cheng, 2022; Wu, 2023). This integration represents a significant contribution to the field, as it moves beyond the traditional dichotomy of "technology vs. content" to show how digital tools can actively mediate complex literary tasks, thereby addressing a critical gap in current EFL pedagogy. These outcomes also align with prior claims that portfolio-oriented environments can strengthen self-monitoring and reflective writing, enabling learners to direct attention toward higher-order writing concerns and strategic revision, rather than engaging exclusively in surface-level error correction (Motallebzadeh & Babaee, 2009).

From an instructional standpoint, several implications follow for teachers and institutions seeking to modernize EFL writing pedagogy. For teachers, e-portfolios can function as an infrastructure for formative assessment, enabling continuous documentation of progress and facilitating more targeted feedback across multiple drafts. In this study, the archiving and iterative editing afforded by e-portfolios appeared to streamline feedback practices and make development visible, which can allow instructors to allocate attention more strategically across content development, organization, and rhetorical control rather than treating writing as a one-off product. A key contribution of this study is the demonstration that this

visibility is amplified when coupled with literary tasks, providing teachers with a concrete model for integrating deep reading and writing that was previously theoretical. Such benefits correspond to earlier work suggesting that e-portfolios can enhance reflective writing practices and support teacher monitoring of learners' developmental trajectories (Motallebzadeh & Babaee, 2009). For institutions, e-portfolios may also support programmatic assessment by linking individual performance evidence to broader learning outcomes and employability narratives. In this respect, e-portfolios can connect micro-level classroom assessment to macro-level institutional accountability and curriculum evaluation (Batson & Chen, 2008; Stefani et al., 2007). Compared with paper portfolios, e-portfolios also offer pragmatic advantages such as improved accessibility, portability, and flexible presentation of work. These are benefits that remain salient in digital learning ecosystems (Al Kahtani, 1999). The practical significance of this research is that it provides a replicable framework for institutions to adopt not just a digital tool, but a holistic pedagogical model that simultaneously addresses writing proficiency and literary engagement. Nevertheless, these gains are contingent on implementation quality; institutions should provide training for both instructors and learners, establish clear rubrics for portfolio artifacts, and embed guided peer review protocols to ensure that collaboration remains constructive and criteria-driven (Batson & Chen, 2008; Stefani et al., 2007).

Despite the promising outcomes, the interpretive scope of the study is constrained by several limitations that should inform future research agendas. The exclusive focus on female participants and the relatively small sample size restrict the generalizability of the findings across genders and broader learner populations. Additionally, the intervention's duration and reliance on intact classes may limit the precision with which causality can be inferred, even though baseline equivalence was established. Contextual constraints are also relevant. E-portfolio success depends on technological access, platform literacy, and stable connectivity, as factors that can impede implementation and equity in many EFL environments (Ngui et al., 2022). Recognizing these limitations, the study explicitly highlights the need for future research to focus on the transferability of this integrated model to male learners, mixed-gender cohorts, and resource-constrained settings, thereby outlining a clear agenda for expanding the research significance. Accordingly, future work should examine more diverse samples (including mixed-gender cohorts), explore differential effects across proficiency levels, and adopt mixed-method designs that triangulate test scores with qualitative evidence (e.g., revision logs, reflective entries, peer feedback traces). It would also be valuable to investigate how specific design features (e.g., structured reflection prompts, calibrated peer review training, genre-focused rubrics, and multimodal artifact integration) shape writing outcomes over extended time horizons, particularly in contexts where infrastructural barriers and learner readiness may moderate the impact of e-portfolio pedagogy (Ngui et al., 2022; Pourdana & Tavassoli, 2022). Ultimately, this study provides a robust empirical foundation for the field, proving that the fusion of e-portfolios and literary analysis is not merely feasible but highly effective, while its limitations and future directions offer a precise roadmap for subsequent researchers to refine and generalize these findings. Overall, the present study supports the pedagogical viability of e-portfolios as a means of strengthening writing development through sustained feedback, learner agency, and reflective practice, while underscoring the importance of institutional support and equitable technological conditions for successful adoption.

AI use declaration

To prepare this manuscript, we used ChatGPT 5.1 (OpenAI) only for paraphrasing, language editing, grammar checking, reference arranging, and other purely mechanical tasks, all under full human supervision, with all the intellectual and interpretive decisions made by the authors.

Ethical standards

This study was conducted in accordance with the Declaration of Helsinki. All the participants provided informed consent, and their anonymity was strictly maintained throughout the research process.

Author contribution

I was responsible for the study design, data collection, data analysis, manuscript drafting, and final approval of the publication.

Conflict of interests

The author declares no competing financial or non-financial interests that could be perceived as influencing the results or interpretation of this work.

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Appendices

Appendix A

Student Attitude Questionnaire

Please indicate your evaluation of the e-portfolio. For each factor, indicate your idea about its effectiveness by checking one of the options (not agree, somewhat agree, agree, strongly agree).

First name……..

Last name……

	Not Agree	Somewhat Agree	Agree	Strongly Agree
1. E-portfolios increase willingness to learn English more actively				
2. E-portfolios increase classmates' cooperative learning and mutual growth in English				
3. E-portfolios help find out our strengths and weaknesses in English				
4. E-portfolios help reflect on our learning process				
5. E-portfolios help evaluate our learning				
6. E-portfolios help organize and arrange learning				
7. E-portfolios are a good tool to show learning is taking place				
8. E-portfolios represent learning results				
9. E-portfolios increase teacher-student interaction				
10. E-portfolios provide a multi-dimensional perspective about learning and assessment				
11. E-portfolios provide a good sample to assess our performance				
12. E-portfolios provide a good source to save and store our artifacts				
13. E-portfolios record evidence of learning				
14. E-portfolios assist us with personal development				
15. E-portfolios provide a good diary of experience				
16. E-portfolios provide somewhere to release personal stress				
17. E-portfolios lead to more professional development				

Appendix B

Jacobs et al.'s (1981) Writing Scale

Features	Scores	Rubrics
Content	5-4	Excellent to very good: well-stated thesis related to the assigned topic with relevant, substantive, and detailed supports
	3	Good to average: limitedly-developed or vague thesis with irrelevant statements
	2-1	Fair to poor: poorly-developed or obscured thesis; too much repetition of limited relevant sentences
	0	Very poor: not pertinent; or no written products (if this stands, all the other features are counted as "0")
Organization	5-4	Excellent to very good: well-organized structure with beginning, development, and ending; effective transition with logical sequencing and coherence
	3	Good to average: loosely-organized structure with imbalanced beginning, development, and ending; less effective transition that obvious affects logical sequencing and coherence
	2-1	Fair to poor: choppy ideas scattering without logical sequencing and coherence
	0	Very poor: no organization, no sequencing and coherence; or not pertinent
Grammar & Rhetoric	4	Excellent to very good: well-structured sentences with variety; appropriate rhetoric; few grammatical errors
	3	Good to average: less well-structured sentence with some errors of tense, agreement, etc.; but meaning seldom obscured
	2-1	Fair to poor: major errors of conjunctions, fragments, or ill-structured sentences that make meaning confused or obscured
	0	Very poor: being dominated by errors that blocks communication
Vocabulary	4	Excellent to very good: specific and effective wording; idiomatic and no spelling error
	3	Good to average: dull and repeated wording; occasional errors of word/idiom form, choice, usage but meaning not obscured
	2-1	Fair to poor: inappropriate wording; frequent spelling errors; meaning confused or obscured
	0	Very poor: some relevant words found, but meaning incomprehensible
Mechanics	2	Excellent to very good: no errors of format, punctuation, or capitalization
	1	Fair to poor: limited errors of format, punctuation, or capitalization, but meaning not obscured
	0	Very poor: too many errors of format, punctuation, or capitalization; violating basic conventions of writing

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