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Modelling the relationships among feedback engagement, writing self-efficacy, and assessment performance among EFL learners: A structural equation modelling approach

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ABSTRACT

This study explored the relationships between feedback engagement, writing self-efficacy, and perceived assessment performance among Saudi EFL university students. Based on the Feedback Engagement Framework and Self-Regulated Learning theory, the research aimed to explain how students' engagement with feedback influences their confidence in writing and perceived achievement. A total of 725 undergraduates completed a validated questionnaire, and the proposed model was tested using structural equation modelling following exploratory and confirmatory factor analyses. The results showed that feedback engagement positively predicted both writing self-efficacy ($\beta = 0.54$, $p < 0.001$) and perceived assessment performance ($\beta = 0.28$, $p = 0.002$). Writing self-efficacy also positively affected assessment performance ($\beta = 0.42$, $p < 0.001$) and partially mediated the relationship between engagement and performance ($\beta = 0.23$, $p < 0.001$). These findings suggest that students who actively engage with feedback develop stronger confidence in their writing abilities, leading to higher perceived performance. The study enhances theoretical understanding of feedback as a motivational and self-regulatory process and offers practical recommendations for fostering learner autonomy, reflection, and improvement through formative assessment practices in Saudi higher education.

Keywords: Feedback engagement, writing self-efficacy, assessment performance, Saudi EFL learners, structural equation modelling

1. Introduction

Writing is central to second language education as a demanding skill that combines linguistic accuracy, rhetorical organisation, and self-regulation. It is through writing that learners show their command of grammatical structures, vocabulary, and discourse competence (Saeed & Alharbi, 2023). In English as a Foreign Language (EFL) settings, writing remains a persistent challenge: many learners can recognise linguistic forms but struggle to create coherent and purposeful texts (Atasoy, 2021). In such contexts, feedback plays a vital pedagogical role in supporting ongoing improvement because it helps learners

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identify weaknesses and develop strategies for revision. Nonetheless, both classroom experience and research show that feedback is effective only when students actively engage with it (Vattøy et al., 2021).

The idea of feedback engagement has gained more attention recently. It describes the process by which learners cognitively interpret, behaviorally apply, and emotionally respond to feedback (Gan et al., 2023). Each aspect plays a distinct role in determining whether feedback leads to learning. Cognitive engagement involves understanding the meaning and purpose of comments. Behavioural engagement refers to the effort shown in revising and applying suggestions. Affective engagement encompasses the emotional responses that affect openness to teacher input (Zhang & Hyland, 2022). In many EFL settings, including Saudi universities, students often approach feedback passively, seeing it as an evaluation rather than an opportunity for development (Saeed & Alharbi, 2023). This limited engagement often results in recurring writing issues and minimal progress in performance (Alsahil et al., 2024).

A second key concept in writing development is writing self-efficacy, defined as an individual's belief in their ability to manage all stages of writing from idea generation to final revision (Bruning et al., 2013). Self-efficacy influences learners' persistence, motivation, and willingness to take risks when improving their work. Students with higher self-belief tend to approach feedback with curiosity and sustained effort, while those with lower confidence may ignore or misinterpret teacher comments (Teng & Wang, 2023). Evidence consistently shows that self-efficacy predicts writing quality, strategy use, and ongoing engagement in revision (Mitchell et al., 2023). Recent research also suggests that supportive digital environments can enhance self-efficacy by providing immediate and adaptive feedback, which alleviates anxiety and encourages reflection (Pellas, 2023). Despite this expanding body of research, empirical models that combine feedback engagement and self-efficacy to explain writing achievement remain limited (Lu et al., 2024).

Within Saudi higher education, significant investment has been made to enhance English writing instruction through communicative curricula and formative assessment. However, many students still make limited progress despite regular feedback. This pattern indicates that the core issue is less about providing feedback and more about how learners internalise and respond to it. Understanding the relationship between feedback engagement and writing self-efficacy can thus offer valuable insights into the psychological and behavioural factors influencing writing performance.

This study explores the issue using a structural equation modelling (SEM) approach to examine the links between feedback engagement, writing self-efficacy, and perceived assessment performance. It seeks to explain how engagement functions as a motivational and cognitive process that affects learners' confidence and, consequently, their writing results. The research adds to the understanding of writing development in EFL contexts by presenting a validated model based on Saudi university settings, where feedback practices and learner beliefs continue to develop alongside ongoing educational reforms.

2. Literature Review

2.1 Feedback Engagement in Second Language Writing

Feedback is a key pedagogical element in second-language writing because it offers learners evaluative input that can guide revisions and promote improvement. Hyland and Hyland (2019) describe feedback as a communicative act that connects instruction with learner responses, where progress relies on how students interpret and apply commentary rather than on its quantity or format. When feedback is seen as an interactive and developmental process, writing becomes an iterative activity that encourages reflection and refinement.

The concept of feedback engagement provides a clear framework for understanding how learners participate in this process. Pearson (2024) describes engagement as having three connected parts: cognitive, behavioural, and affective. The cognitive part involves analysing the meaning of feedback and connecting it to linguistic or rhetorical knowledge already held by the learner. Behavioural

engagement refers to visible responses, such as revising drafts, experimenting with different language choices, or seeking clarification (Liu & Storch, 2023). The affective part involves emotional reactions, including curiosity, confidence, or frustration, that impact how feedback is received and whether it is used effectively (Fan & Xu, 2020). Earlier research by Zhang and Hyland (2018) similarly observed that student engagement varies depending on how clear and helpful they find the teacher's and automated feedback. Together, these dimensions explain why some learners turn feedback into growth, while others lose interest soon after receiving it.

Empirical research consistently shows that engagement varies among learners, tasks, and feedback sources. Ranalli (2021) found that students often pay selective attention to automated comments, focusing on surface corrections rather than meaning-related issues. Zhang and Gao (2024) observed a similar pattern in peer-feedback settings, where cultural norms and social sensitivity influence learners' willingness to respond critically. Zhang et al. (2023) further demonstrated that engagement in giving peer feedback gradually develops over time, suggesting that feedback participation is a learnable skill rather than a fixed trait. In contrast, Fu and Huang (2025) documented that sustained engagement, characterised by repeated revision and reflection, leads to measurable improvements in writing quality. These studies indicate that engagement is affected by learners' perceptions of feedback relevance and trustworthiness.

Contextual and cultural factors also have a decisive influence. Tian and Zhou (2020) reported that students in online EFL courses interact differently with teacher, peer, and automated feedback depending on institutional culture and assessment expectations. In Arab EFL classrooms, teacher authority often limits open dialogue, causing students to accept feedback passively instead of negotiating its meaning (Saeed & Alharbi, 2023). Institutional pressures such as large class sizes and limited conferencing time further reduce opportunities for ongoing interaction, making engagement a socially situated rather than solely individual practice. Tran and Qing (2024) found that training learners in peer feedback through self-regulated learning principles can improve engagement by encouraging goal setting and reflective awareness.

Technological forms of feedback have expanded the ways learners interact with written commentary. Lee (2020) found that automated content-feedback systems can boost cognitive engagement when perceived as reliable and constructive. Zhang and Hyland (2025) subsequently showed that students' digital literacy mediates the depth of their interaction with automated writing evaluation, affecting both engagement and writing outcomes. However, concerns about the credibility of automated feedback continue in contexts where teacher authority remains dominant (Ranalli, 2021).

Closely connected to engagement is the concept of feedback literacy, which explains why learners vary in their ability to interpret and utilise feedback. Zhang and Hyland (2022) describe literacy as the knowledge, attitudes, and strategies that enable productive use of evaluative input, while Mao and Lee (2024) argue that engagement is the visible result of such literacy. Learners with stronger literacy tend to maintain engagement and revise purposefully, whereas those with weaker literacy depend heavily on teacher guidance.

2.2 Writing Self-Efficacy and Its Role in Second-Language Writing Development

Writing self-efficacy plays a key role in explaining how learners approach second-language writing. Bandura's social-cognitive theory refers to the belief in one's ability to organise and perform the actions necessary for effective writing (Pajares, 2003). In language education, these beliefs influence motivation, persistence, and willingness to engage with feedback. Learners who see themselves as capable writers tend to view writing as a challenge they can handle, while those with weaker beliefs often avoid it and experience anxiety (Pajares & Valiante, 1997).

Self-efficacy plays both motivational and behavioural roles. Firm beliefs in one's ability encourage goal setting and persistence during complex writing tasks, leading to adaptive coping when challenges arise

(Pajares et al., 2007). Conversely, limited efficacy restricts self-regulation, leading to minimal revisions or superficial corrections. Research consistently demonstrates a positive relationship between writing self-efficacy and writing achievement across various proficiency levels (Goetze & Driver, 2022). Learners with higher confidence tend to produce more coherent, accurate, and rhetorically effective texts (Golparvar & Khafi, 2021).

Writing self-efficacy is multidimensional, covering ideation, conventions, and self-regulation. Bruning et al. (2013) described these dimensions as interconnected factors that together predict both writing quality and perceived competence. Ideation involves creating and organising ideas; conventions relate to grammatical and lexical control; and self-regulation pertains to managing planning, drafting, and revising activities. Varier et al. (2021) demonstrated that learners with higher self-regulatory efficacy tend to be more accurate in self-assessing their argumentative writing. Camacho et al. (2021) also confirmed that motivational and behavioural factors jointly explain variation in writing performance, highlighting the multifaceted nature of efficacy beliefs.

Empirical evidence from L2 contexts supports the role of self-efficacy as a mediator between instructional experience and writing outcomes. Tsao (2021) reported that EFL learners with higher efficacy engage more constructively with written corrective feedback. Cui et al. (2021) found that both teacher and peer feedback improved learners' self-efficacy and internalised motivation, leading to improved writing performance. Similarly, Grenner et al. (2021) observed that intervention programmes designed to strengthen efficacy beliefs result in better narrative text quality among younger learners. These findings confirm that self-efficacy regulates learners' emotional and behavioural responses to evaluative input.

Self-efficacy develops through four primary sources outlined in Bandura's framework. Mastery experience remains the most influential, as successful performance boosts perceived competence (Pajares, 2003). Vicarious experience, observing capable peers, also shapes belief formation (Pajares & Valiante, 1997). Verbal persuasion, such as teacher affirmation, supports efficacy only when aligned with tangible progress (Pajares et al., 2007). Emotional states can affect cognitive functioning during writing; anxiety or fatigue often decreases perceived control and quality of performance (Harris, 2023). Recent studies extend this framework to contemporary L2 writing environments. Mendoza et al. (2022) linked university students' reflective journals to the development of academic writing self-concepts, showing that self-efficacy evolves through self-awareness. Bai et al. (2021) demonstrated that efficacy interacts with task values and growth mindset to predict writing competence within Confucian educational settings. Sun et al. (2025) profiled approaches to writing and found that high-efficacy learners reported greater openness to integrating feedback from large language models. Teng (2024) confirmed that self-regulated learning strategies mediate the relationship between motivational beliefs and writing performance, emphasising the close connection between self-efficacy and self-regulation. Zhang and Zhang (2025) similarly identified distinct profiles of L2 writers whose self-regulatory behaviours correspond with their efficacy levels.

Within Saudi EFL contexts, fostering strong writing self-efficacy remains a persistent instructional challenge (Saeed & Alharbi, 2023). Many learners are accustomed to assessments that focus on accuracy and have limited opportunities for genuine writing practice (Alsahil et al., 2024; Lu & Mustafa, 2021). Feedback that primarily targets error correction can diminish confidence and discourage experimentation with language (Mao & Lee, 2024; Lu et al., 2024). Muhammad (2024) found that differences in self-efficacy between Arabic and English significantly impact the English writing achievements of Saudi students, illustrating how cross-linguistic perceptions influence performance. Al-Khresheh (2024) identified gender-based differences in English self-efficacy among Saudi learners, indicating that confidence levels vary across language skills and lead to different learning outcomes. These findings suggest that emotional and contextual factors significantly influence efficacy beliefs in Saudi classrooms (De Vleeschauwer, 2023; Meccawy et al., 2023). Teaching methods that incorporate formative assessment, clear goal setting, and supportive teacher–learner communication can reinforce a sense of progress and control, resulting in more confident and reflective writing behaviour (Ismail et al., 2023; Xu et al., 2024). Writing self-efficacy, therefore, functions as the

psychological link between engaging with feedback and attaining measurable writing results (Golparvar & Khafi, 2021; Teng & Wang, 2023). It mediates the transition from external assessment to internal competence, shaping how learners interpret, manage, and respond to feedback (Camacho et al., 2021). Recognising its role is essential for developing a comprehensive model of second-language writing that integrates cognitive, motivational, and emotional factors.

2.3 Assessment Performance and Its Relationship with Engagement and Self-Efficacy

Assessment performance in second-language writing clearly displays linguistic growth and the integration of different writing skills. According to Fathi et al. (2021), assessment results illustrate how effectively learners combine linguistic accuracy, organisation, and rhetorical clarity to produce coherent texts. Writing assessment goes beyond simply measuring grammatical correctness or idea fulfilment; it reflects how learners internalise instruction and transform evaluative feedback into improved writing (Chung et al., 2021). In EFL contexts, assessment serves both summative and formative purposes; however, its developmental value primarily depends on learners' engagement with feedback and their confidence in managing the demands of writing (Teng & Wang, 2023).

Learners' interpretations of assessment outcomes significantly influence their motivation and persistence. When students view performance results as opportunities for improvement, assessment catalyses ongoing effort and self-regulation. Ismail et al. (2023) noted that authentic assessment tasks encourage greater autonomy and lasting motivation for learning. Conversely, when learners regard assessment as a final goal, its formative purpose is lost. Evidence from Sökmen (2021) shows that in grade-focused environments, perceptions of assessment often determine whether students internalise or ignore feedback once grades are given.

Writing self-efficacy acts as a psychological link connecting assessment and behavioural response. Students with high efficacy beliefs interpret feedback and scores as diagnostic tools that can guide improvement (Golparvar & Khafi, 2021). Conversely, those with weaker efficacy tend to personalise poor results, which can discourage revision and re-engagement. Research indicates that efficacy beliefs influence how learners attribute causes of success and failure: confident writers attribute setbacks to the use of strategy or effort (Zhao & Cao, 2023), while low-efficacy writers associate them with innate ability. In this way, self-efficacy mediates the connection between past achievement and future performance (Hao & Lu, 2024). Structural modelling carried out by Xu et al. (2024) similarly showed that efficacy and self-regulated learning strategies together predict sustained engagement in EFL contexts.

Feedback engagement provides the behavioural mechanism that links assessment with performance development. According to Lu and Mustafa (2021), cognitive engagement enables learners to connect comments to task objectives, behavioural engagement turns this understanding into revision, and affective engagement sustains the emotional investment needed for improvement. When these elements work together, students show deeper revision and higher quality in subsequent tasks. Evidence from López-Crespo et al. (2022) supports this, indicating that students who actively engage with written feedback through iterative e-portfolio tasks achieve better writing results. Similarly, Zhou et al. (2025) found that self-efficacy mediates the impact of teacher emotional support on interactional engagement, confirming that positive affect helps maintain performance.

The relationship among engagement, self-efficacy, and assessment performance creates a continuous developmental cycle. Effective engagement boosts performance, which in turn enhances self-efficacy, and increased self-efficacy fosters deeper future engagement (Huang, 2022). Ismail et al. (2023) found that authentic assessment methods support this cycle by encouraging reflection and self-assessment. Additional evidence from Meccawy et al. (2023) showed that game-based writing assessments boost motivation and perceived competence by linking enjoyment with observable progress. Overall, these studies indicate that engagement and efficacy strengthen each other through successive assessment experiences.

In Saudi EFL universities, assessment practices remain chiefly product-oriented, with limited opportunities for formative dialogue. De Vleeschauwer (2023) reported that such grading practices restrict learners' engagement and narrow the pedagogical purpose of assessment. When numerical grades overshadow developmental feedback, students prioritise correctness over comprehension and experimentation. Research within the Saudi context supports these concerns. Muhammad (2024) found that writing self-efficacy in Arabic and English significantly influences the English-writing achievement of Saudi students, demonstrating how confidence across languages impacts assessment outcomes. Similarly, Al-Khresheh (2024) identified gender-based differences in English self-efficacy among Saudi EFL learners, revealing that variations in confidence lead to different performance patterns. Promoting formative assessment that incorporates reflection and multiple drafting opportunities, as Lu and Mustafa (2021) suggest, could transform assessment from mere evaluation to an ongoing learning process. Such reforms are especially relevant in Saudi universities, where strengthening formative assessment can enhance writing self-efficacy and encourage deeper engagement with feedback.

2.4 Conceptual Framework and Hypothesis Development

Previous studies have shown that both feedback engagement and writing self-efficacy are vital factors in the progress of second-language writing. Feedback engagement enables learners to interpret and act on evaluative information through cognitive, behavioural, and emotional aspects (Zhang & Hyland, 2022; Pearson, 2024). When students analyse feedback critically, use it constructively, and manage their emotional responses, they turn teacher comments into real improvement. Writing self-efficacy, defined as learners' confidence in their ability to handle the steps involved in effective composition (Bruning et al., 2013; Pajares, 2003), influences persistence, motivation, and strategic effort during the writing process. Those with stronger self-beliefs tend to engage more actively with feedback and show greater resilience when revising their work (Teng & Wang, 2023).

According to social-cognitive theory (Bandura, 1997), these constructs interact reciprocally through personal, behavioural, and environmental influences. Engagement reflects a behavioural outcome of learners' perceptions of feedback value, while self-efficacy governs the persistence needed to benefit from it (Pajares et al., 2007; Harris, 2023). Repeated engagement provides mastery experiences that strengthen efficacy, which in turn sustains further engagement and leads to improved performance (Camacho et al., 2021; Cui et al., 2021).

Empirical research supports parts of this framework but rarely examines the three variables together. Feedback engagement has been shown to predict revision quality and progress (Vattøy et al., 2021; Zhang & Hyland, 2025), while self-efficacy consistently correlates with writing achievement (Golparvar & Khafi, 2021; Bai et al., 2021). There is limited evidence that integrates engagement, self-efficacy, and assessment performance within a single structural model. Lu et al. (2024) noted that feedback literacy influences performance indirectly through engagement, and Hao and Lu (2024) showed that self-efficacy mediates the relationship between prior and final writing achievement. Despite these developments, a comprehensive model linking these constructs remains absent, mainly from EFL higher education contexts.

This gap is particularly evident in Saudi universities, where many learners show low engagement with feedback and limited confidence in their writing despite ongoing curricular reform (Saeed & Alharbi, 2023; Alsahil et al., 2024). Muhammad (2024) found that differences in Arabic and English self-efficacy significantly influence Saudi students' English writing achievement, while Al-Khresheh (2024) reported gender-based variations affecting writing outcomes. These studies confirm the importance of affective and contextual factors but do not model how feedback engagement and self-efficacy jointly predict assessment performance. Addressing this empirical gap is essential for understanding the mechanisms that shape writing development in the Saudi EFL context.

Consequently, this study aims to explore the relationships between feedback engagement, writing self-efficacy, and assessment performance using an SEM approach. This study aims to investigate how feedback engagement influences the writing self-efficacy and assessment performance of Saudi EFL learners, and whether writing self-efficacy mediates the relationship between feedback engagement and assessment performance. To achieve this, the following hypotheses were developed from the literature and proposed for testing.

- **H1:** Feedback engagement positively predicts writing self-efficacy among Saudi EFL learners.
- **H2:** Feedback engagement positively predicts assessment performance among Saudi EFL learners.
- **H3:** Writing self-efficacy positively predicts assessment performance among Saudi EFL learners.
- **H4:** Writing self-efficacy mediates the relationship between feedback engagement and assessment performance.

Based on the literature review and formulated hypotheses, the conceptual model presented in Figure 1 illustrates the proposed relationships among the study variables.

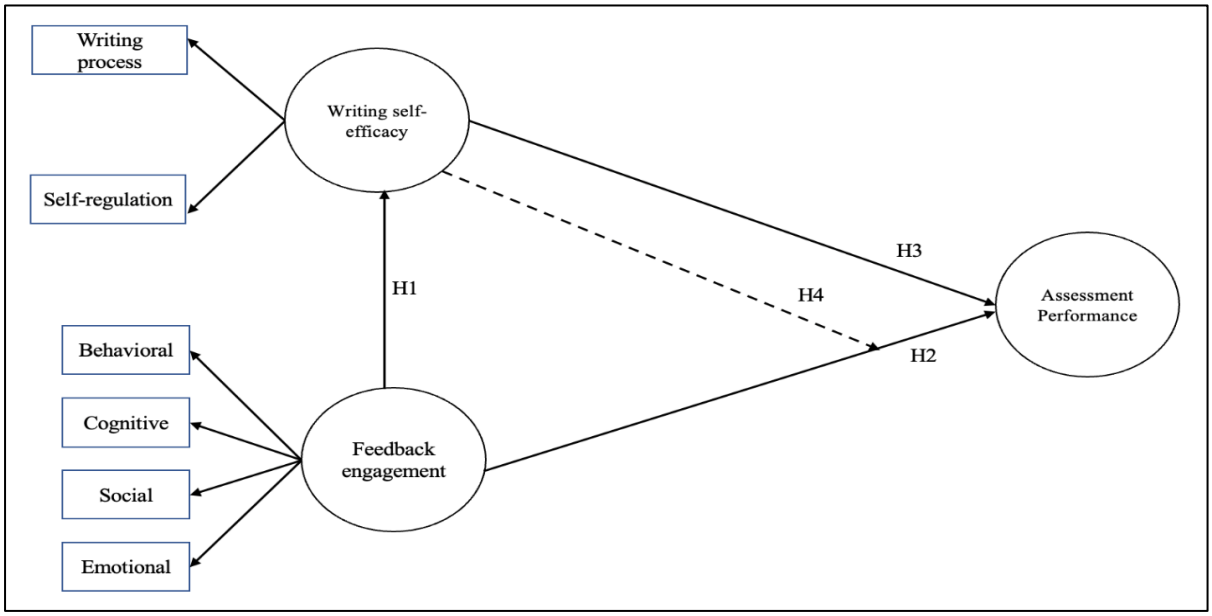

Figure 1. *Conceptual model of the hypothesised relationships among feedback engagement, writing self-efficacy, and assessment performance.*

3. Research Methods

3.1 Research Design

This study adopted a quantitative correlational design grounded in the positivist paradigm to examine the structural relationships among feedback engagement, writing self-efficacy, and perceived assessment performance among Saudi EFL learners. A validated self-report questionnaire was used to collect data from a large sample of university students, and the relationships among variables were analysed using SEM. This design enabled the simultaneous testing of direct and indirect effects, ensuring rigorous assessment of the hypothesised model and the mediating role of writing self-efficacy. Employing SEM allowed for a comprehensive evaluation of both measurement and structural components, ensuring construct validity, reliability, and theoretical coherence. The chosen design was suitable for quantifying the extent to which engagement with feedback influences students' confidence in writing and their perceived performance outcomes within the Saudi EFL higher education context.

3.2 Participants

The study included 725 Saudi EFL university students enrolled in undergraduate English language courses offered by various public and private universities. To ensure balanced representation across gender, academic level, and institution type, a stratified random sampling approach was applied. Participants ranged in age from 18 to over 25 years, with the majority belonging to the 18–21 age group. The sample comprised slightly more female students (54.1%) than male students (45.9%), reflecting the demographic distribution common in English programmes across Saudi universities. Students were drawn from all four academic levels, providing a diverse range of writing experience and exposure to feedback practices. The demographic characteristics of the participants are presented in Table 1.

Table 1. *Demographic Profile of Participants (N = 725)*

Variable	Category	N	%
Gender	Male	333	45.9
	Female	392	54.1
Academic Level	First year	182	25.1
	Second year	196	27.0
	Third year	189	26.1
	Fourth year	158	21.8
University Type	Public	489	67.4
	Private	236	32.6
Age Range (years)	18–21	402	55.4
	22–25	251	34.6
	More than 25	72	9.9

3.3 Instruments

A structured questionnaire was employed to assess three primary constructs: feedback engagement, writing self-efficacy, and perceived assessment performance. All instruments had been validated in prior studies and tailored to fit the Saudi EFL university context. Responses were recorded on a five-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Two applied linguistics experts reviewed the questionnaire to ensure clarity of concepts, linguistic accuracy, and contextual relevance before its administration.

Learners' engagement with feedback was assessed using the Feedback Engagement Scale (FES), developed by Gan et al. (2025), and based on the conceptual framework proposed by Han and Xu (2021). The FES includes four interconnected dimensions: behavioural, cognitive, social, and emotional engagement. The behavioural dimension (seven items) measures how learners respond to feedback by planning, revising, and regulating their learning (e.g., "I improve my work based on the feedback I receive"). The cognitive dimension (six items) examines how learners process, interpret, and apply feedback to identify weaknesses and improve performance (e.g., "If I cannot understand received feedback at first, I keep going over it until I do"). The social dimension (six items) reflects learners' willingness to participate in feedback exchange, such as seeking and giving feedback to peers and teachers (e.g., "I actively seek teacher feedback in learning"). The emotional dimension (four items) captures affective responses to feedback, including enjoyment, openness, or frustration (e.g., "I enjoy receiving challenging feedback on my studies"). Previous research has reported satisfactory reliability for this instrument (α = .86–.93), and slight wording adjustments were made in the current study to better suit Saudi university writing courses.

Writing self-efficacy was measured using the 'English Paragraph Writing Self-Efficacy Belief Scale' adapted from Karafil and Oğuz (2022) (WSEBS). The scale includes 33 items across two dimensions: Writing Process and Rules (17 items) and Self-Regulation (16 items). The first dimension assesses confidence in managing linguistic and structural aspects of writing (e.g., "I can use appropriate transition words to connect ideas" and "I can integrate feedback to improve my paragraph's quality"). In contrast, the second evaluates self-regulatory skills such as time management, emotional control, and

goal setting (e.g., “I can stay motivated to write even when I face difficulties” and “I can reflect on my writing performance to plan for improvement”). The original scale showed strong internal consistency ($\alpha = .94$) and construct validity, confirmed through confirmatory factor analysis. In this study, contextual adaptation was limited to wording adjustments suitable for Saudi academic writing classes, without changing the conceptual integrity of the items.

Perceived assessment performance was assessed using the Self-Efficacy for Learning and Performance Subscale from Pintrich and De Groot (1990) (PAPS), which comprises nine items evaluating students’ confidence in mastering course content and achieving strong assessment results. Items were adapted to the writing domain (e.g., “I’m sure I can do an excellent job on my English writing assignments” and “I expect to perform well in my English writing assessments”). The original version reported a Cronbach’s alpha of .89, indicating high reliability across educational contexts. The adapted version was piloted to confirm its clarity and relevance for Saudi EFL learners (See Appendix 1: Tools)

3.4 Validation

The validation of the research instrument followed a systematic, multi-stage process designed to confirm its psychometric soundness before full implementation. This process comprised expert review, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and reliability testing. Content validation was first secured through evaluation by three specialists in applied linguistics and English language education. They examined all items for precision, conceptual relevance, and consistency with the constructs of feedback engagement, writing self-efficacy, and perceived assessment performance. Based on their professional feedback, several statements were linguistically refined to ensure that each subscale accurately reflected its intended domain.

A pilot study was subsequently conducted with 346 Saudi EFL university students, who were randomly divided into two equal subsamples of 173 participants each. The first subsample was used for the EFA, employing principal component analysis with varimax rotation to uncover the latent structure of the instrument. Items with factor loadings below .40 or with high cross-loadings were removed or modified to achieve conceptual clarity and statistical precision. The revised structure was then verified through CFA using the second subsample. Multiple model-fit indices were inspected, namely, the Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardised Root Mean Square Residual (SRMR). All indices met accepted benchmarks, supporting the adequacy of the measurement model.

Internal consistency was confirmed through Cronbach’s alpha coefficients, all of which exceeded the .70 benchmark, indicating acceptable reliability across all subscales. Composite reliability (CR) values were above .80, reflecting strong construct stability, while average variance extracted (AVE) values greater than .50 demonstrated satisfactory convergent validity. Discriminant validity was also supported, as the square roots of the AVEs were higher than the corresponding inter-construct correlations. These indicators verified that the instrument was both valid and reliable for measuring feedback engagement, writing self-efficacy, and perceived assessment performance among Saudi EFL learners. The validated instrument was then used in the primary data collection phase to examine the hypothesised structural relationships among the study variables through SEM analysis.

3.5 Data Collection Procedures and Ethical Considerations

Data for this study were collected over a two-month period during the second academic term of the 2024–2025 year, via the Qualtrics survey platform. The questionnaire was distributed electronically to Saudi EFL students studying English at various universities. To ensure fair representation, a stratified random sampling method was utilised, considering gender, institution type, and academic level. Ethical approval was obtained from the Institutional Review Board at University of Ha’il prior to the commencement of data collection. Participants were informed about the study's purpose, the voluntary nature of their participation, and the measures taken to protect their privacy. They provided digital

consent through Qualtrics prior to completing the survey. No personal identifiers were collected, and participants were reminded that they could withdraw at any point without needing to provide an explanation. All responses were kept confidential and stored in password-protected files accessible only to the researcher. Several steps were implemented to minimise common method bias and safeguard data integrity. Anonymity and voluntary participation reduced social desirability bias, while each item was carefully reviewed to prevent ambiguous or leading wording. Questionnaire sections were presented in a mixed order to discourage patterned responses. After data collection, Harman's single-factor test confirmed that no single factor accounted for the majority of the variance, indicating that common method bias was not an issue.

3.6 Data Analysis

Data analysis followed a structured process to verify the validity of the measurement model and to examine the hypothesised relationships among variables. Preliminary screening confirmed data completeness and normality, with minimal missing values (<2%), which were removed through listwise deletion. The validated instrument was administered to 346 participants during the primary phase. EFA was conducted using SPSS v28 to assess construct dimensionality, followed by CFA in AMOS v28 to evaluate the measurement model. Sampling adequacy was confirmed by the Kaiser–Meyer–Olkin measure and Bartlett's Test of Sphericity. Model fit was evaluated using standard indices, including χ^2/df, CFI, TLI, and RMSEA, all of which indicated an acceptable fit. Internal consistency and validity were determined using Cronbach's alpha, CR, and AVE. After confirming the measurement model, SEM was utilised to test the hypothesised direct and indirect relationships among feedback engagement, writing self-efficacy, and perceived assessment performance. An exploratory multi-group analysis was also conducted to identify potential differences across gender and academic level. The final structural model demonstrated adequate fit and theoretical coherence, supporting the study's conceptual framework.

4. Findings

This section reports the primary statistical analyses performed with data from 346 Saudi EFL learners using SPSS v28 and AMOS v28. The results are presented in four stages: EFA to explore factor structures, CFA to confirm measurement validity, descriptive statistics to check distributional assumptions, and SEM to test the hypothesised model.

4.1 Exploratory Factor Analysis

Preliminary diagnostics confirmed the suitability of the data for factor analysis, with all KMO values exceeding .90 and Bartlett's Test of Sphericity significant at $p < .001$, indicating adequate sampling and inter-item correlations (Table 2).

Table 2. *KMO and Bartlett's Test Results*

Scale	KMO	χ^2	df	p	Factors Retained	% Variance Explained
FES	.93	3210.47	253	< .001	4	66.49 %
WSES	.96	6145.28	528	< .001	2	59.70 %
PAPS	.91	985.42	36	< .001	1	64.00 %

The FES identified four interpretable dimensions: behavioural, cognitive, social, and emotional engagement, accounting for 66.49% of the total variance after removing three weak items (BE6, CE2, SE5). The WSES produced two distinct components, Writing Process and Rules, and Self-Regulation, explaining 59.70% of the variance, with low-loading items excluded. The PAPS demonstrated a unidimensional structure, accounting for 64.00% of the variance, which confirms its coherence as a single-factor measure. These results support the dimensional validity of all three instruments. Detailed rotated matrices and scree plots are provided in Appendix 2.

4.2 Confirmatory Factor Analysis

The CFA verified the factor structures identified through EFA and confirmed the psychometric adequacy of all constructs. Each measurement model achieved an acceptable to excellent fit, as shown in Table 3.

Table 3. *Summary of CFA Results and Model Fit*

Scale	AVE	CR	α	χ^2/df	CFI	TLI	RMSEA	SRMR
FES	.58–.68	.78–.81	.86–.93	2.10	.954	.942	.054	.048
WSES	.58–.76	.82–.87	.91–.94	1.84	.972	.967	.046	.041
PAPS	.67	.92	.87	2.37	.958	.950	.050	.045

All standardised factor loadings exceeded .60, confirming that each observed indicator contributed meaningfully to its latent construct. The FES exhibited AVE values ranging from .58 to .68 and CR values between .83 and .88. At the same time, the WSES showed AVEs from .58 to .76 and CRs between .89 and .96. The single-factor PAPS scale demonstrated strong internal consistency (AVE = .67, CR = .92). Cronbach's α coefficients across all subscales ranged from .78 to .94, indicating excellent reliability. The inter-factor correlations were moderate—ranging from .39 to .54 among FES dimensions and .55 between the two WSES components—remaining below the square roots of their respective AVEs, thereby supporting discriminant validity. Collectively, these indices confirm robust convergent and discriminant validity across all three instruments. The CFA path models (Figures 4 and 5) further visualise the adequacy of the measurement structures, showing that all observed variables loaded substantially on their intended latent factors.

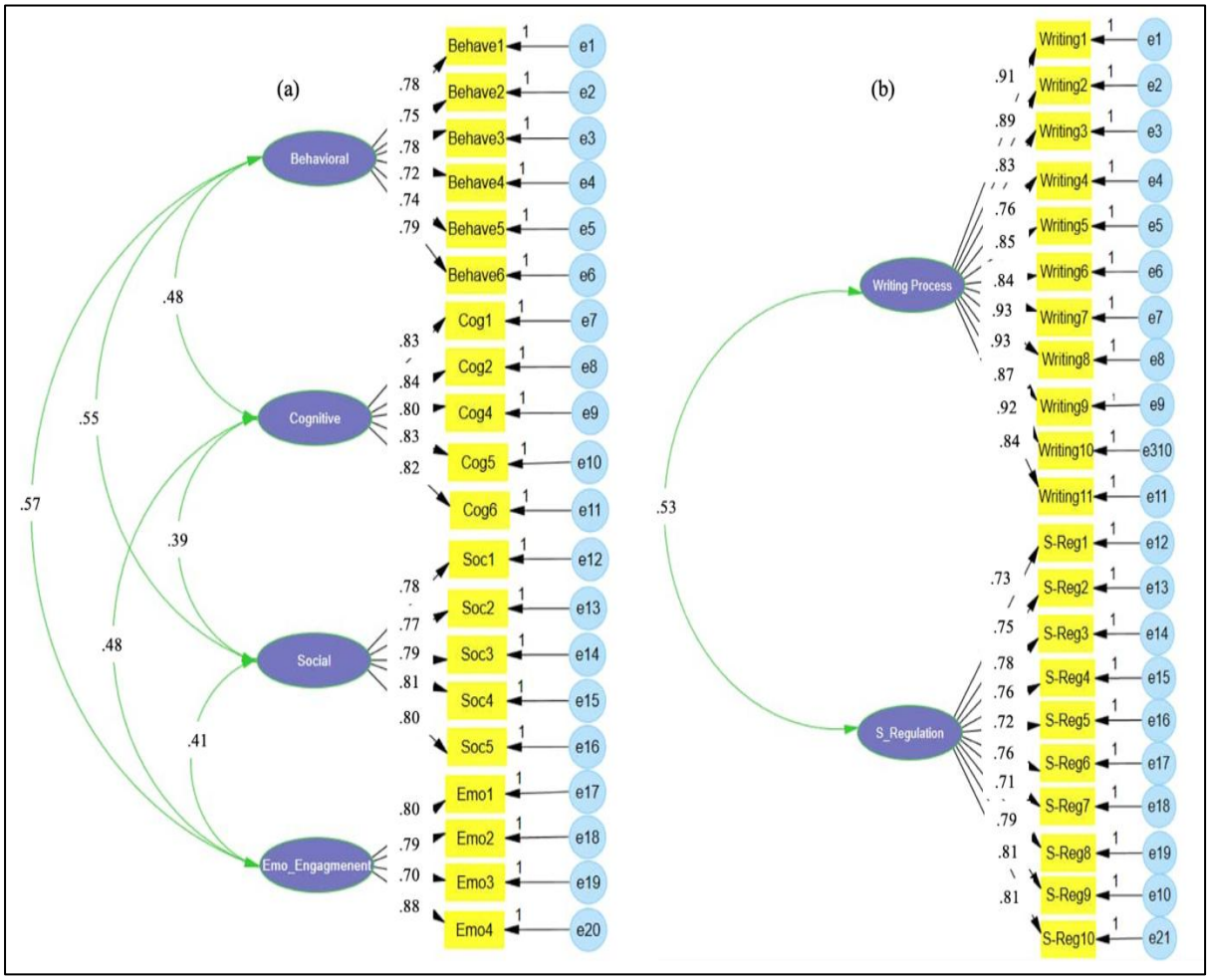

Figure 2. *CFA path models for FES and WSES.*

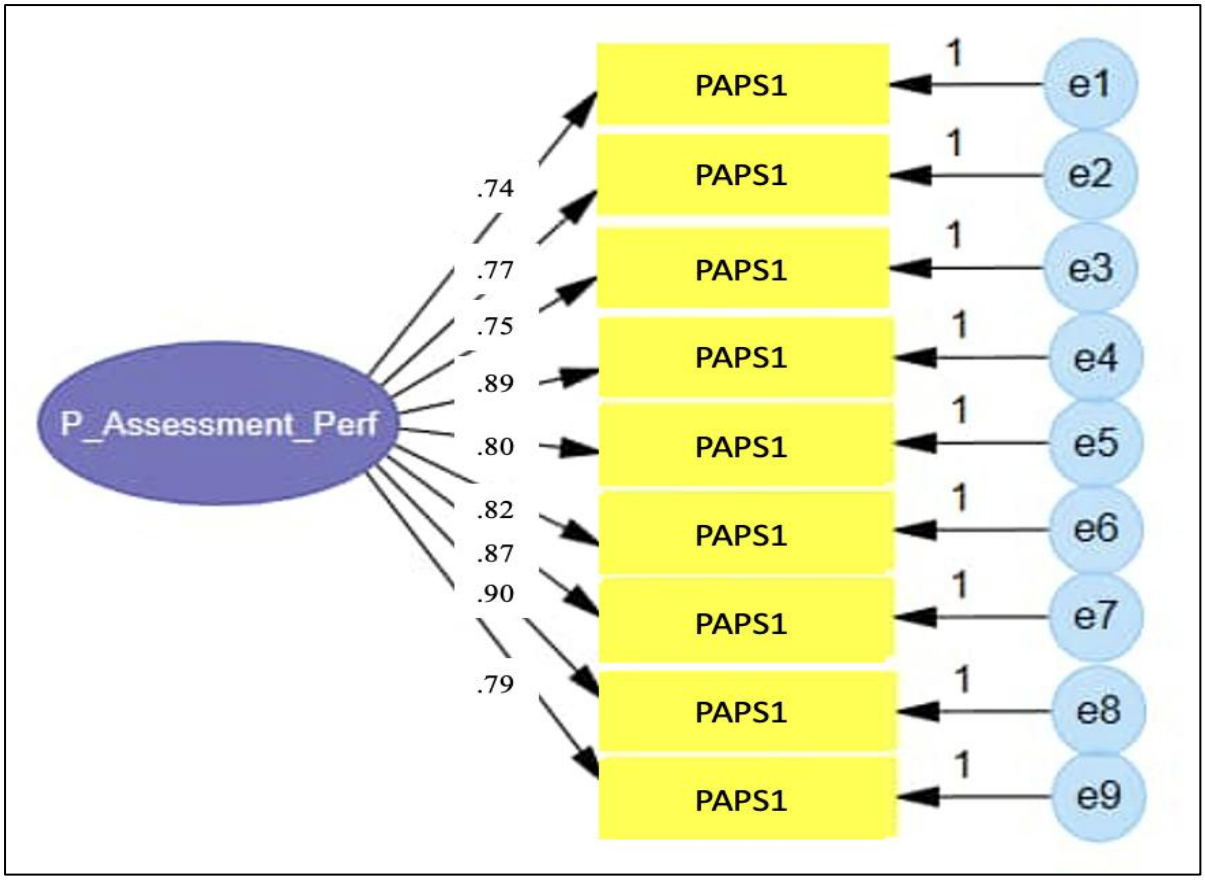

Figure 3. *CFA path model for PAPS.*

4.3 Descriptive Statistics and Normality

Descriptive analysis offered an overview of the learners' overall responses to the three study variables. As shown in Table 4, all constructs recorded mean values between 3.84 and 3.91, indicating that participants generally viewed themselves as moderately to highly engaged with feedback, confident in their writing abilities, and satisfied with their assessment performance. The relatively small standard deviations (0.56–0.61) suggest limited dispersion and consistent response patterns across the sample
.

Table 4. *Descriptive Statistics and Normality Tests*

Variable	Mean	SD	Skewness	Kurtosis
FES	3.84	0.56	–0.42	–0.31
WSES	3.91	0.59	–0.37	–0.45
PAPS	3.88	0.61	–0.28	–0.41

All skewness and kurtosis values fall within the standard ±2 threshold, indicating that none of the variables significantly deviates from normality. This confirms the appropriateness of the data for SEM estimation using maximum-likelihood methods. Consequently, the distribution profile affirms that the constructs are stable, internally consistent, and suitable for future modelling.

4.4 Structural Equation Modelling and Hypothesis Testing

SEM was performed to examine the hypothesised relationships (H1–H4) among feedback engagement, writing self-efficacy, and perceived assessment performance. The final structural model demonstrated a good fit (χ^2/df = 2.09, CFI = .957, TLI = .949, RMSEA = .053, SRMR = .047), indicating that the hypothesised paths adequately reflected the observed data. The overall structure and standardised coefficients are shown in Figure 3.

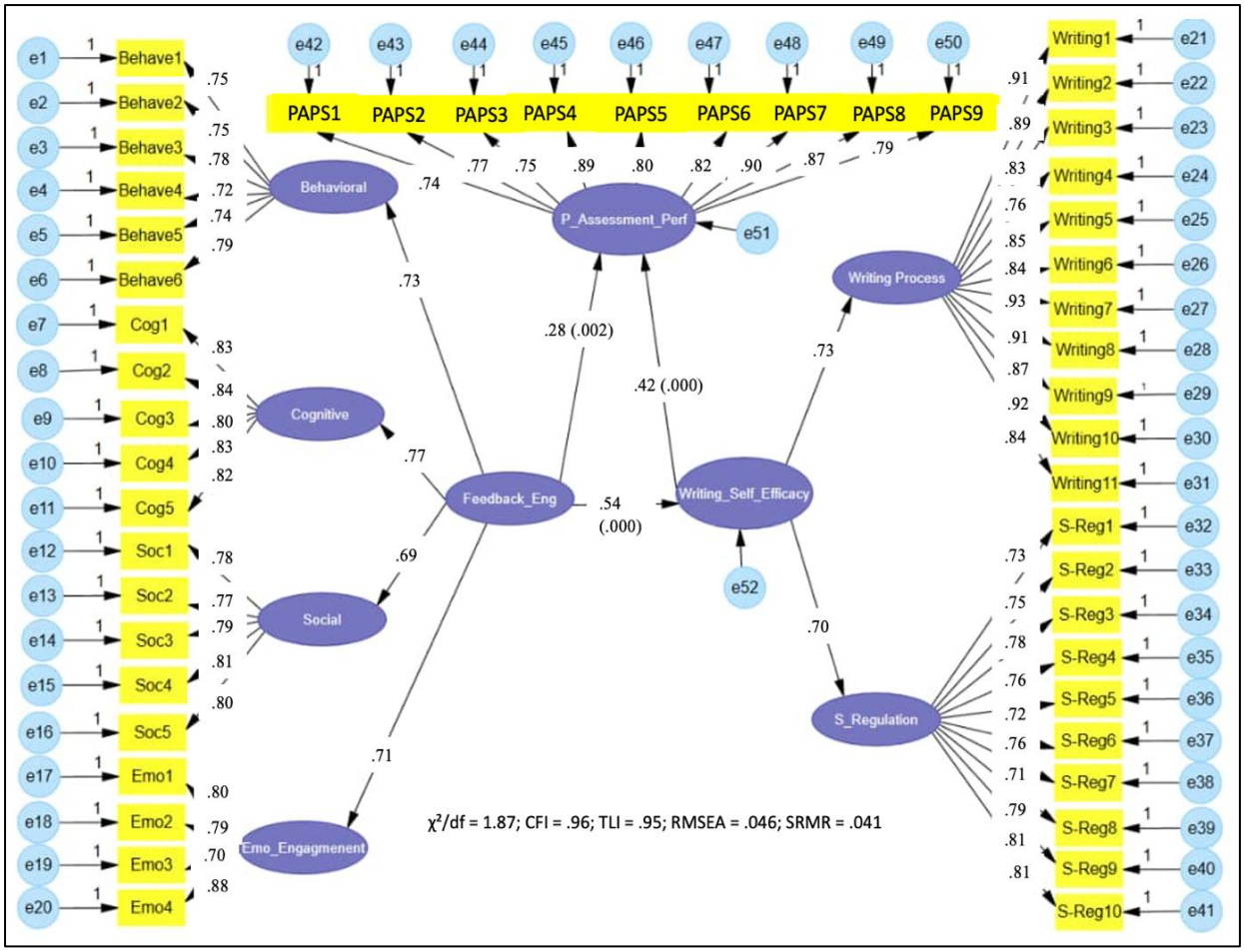

Figure 4. *Final structural model with standardised estimates*

As shown in Table 4, all hypothesised paths were statistically significant and consistent with theoretical expectations. H1 was supported, indicating that feedback engagement had a substantial, positive impact on writing self-efficacy ($\beta = .54$, $p < .001$). H2 was also confirmed, demonstrating that feedback engagement directly predicted assessment performance ($\beta = 0.28$, $p = 0.002$). H3 indicated that writing self-efficacy significantly improved assessment performance ($\beta = .42$, $p < .001$). Lastly, H4 showed a significant indirect pathway ($\beta = 0.23$, $p < 0.001$), confirming that writing self-efficacy partially mediated the relationship between feedback engagement and assessment performance.

Table 5. *Results of SEM*

Path	Std. β	S.E.	95 % CI	p	Result
Feedback Engagement → Writing Self-Efficacy	.54	0.08	[0.46, 0.78]	< .001	Supported (H1)
Feedback Engagement → Assessment Performance	.28	0.09	[0.13, 0.48]	.002	Supported (H2)
Writing Self-Efficacy → Assessment Performance	.42	0.07	[0.29, 0.63]	< .001	Supported (H3)
Feedback Engagement → Writing Self-Efficacy → Assessment Performance	.23	0.06	[0.14, 0.40]	< .001	Supported (H4)

Overall, the findings confirm that all four hypotheses were supported. Feedback engagement, both direct and indirect, influenced perceived assessment performance, with writing self-efficacy acting as a key mediating mechanism. These results support the theoretical model, showing that learners who actively engage with feedback tend to build greater confidence in their writing abilities, which, in turn, improves their perceived performance outcomes.

5. Discussion

5.1 Feedback Engagement and Writing Self-Efficacy (H1)

The analysis revealed a significant positive correlation between feedback engagement and writing self-efficacy ($\beta = .54$, $p < .001$). Learners who actively engaged with teacher feedback expressed greater confidence in their ability to plan, draft, and refine their writing. This suggests that engaging with feedback reinforces students' sense of control over learning and nurtures the belief that effortful revision results in tangible improvements in writing performance. This relationship aligns with previous evidence indicating that active feedback engagement supports motivation and self-confidence in second-language learning. Gan et al. (2023) reported that self-efficacy and perceived feedback value together predict how much learners cognitively and behaviourally engage with evaluative input. Similarly, Cui et al. (2021) found that students participating in trained feedback activities developed stronger self-efficacy and motivation to revise their work. Likewise, Lu et al. (2024) observed that feedback literacy, particularly the ability to interpret and apply comments, indirectly improves writing performance through engagement. These findings suggest that self-efficacy increases as learners learn to transform teacher input into strategies for improvement. The current results also reflect patterns in Saudi EFL contexts, where limited engagement with feedback often leads to diminished confidence and progress in writing (Saeed & Alharbi, 2023; Alsahil et al., 2024). When feedback is viewed as an opportunity for development rather than as a judgment of ability, students become more reflective and self-directed in revising their texts. Such interaction with feedback fosters mastery experiences, which are central to building efficacy beliefs. As shown in more exhaustive EFL research, strong writing self-efficacy sustains learners' perseverance and leads to measurable improvements in performance (Teng & Wang, 2023; Hao & Lu, 2024). These findings support the view that feedback engagement functions not simply as a behavioural response to comments but as a motivational process that enhances learners' belief in their own capability. In the Saudi university context, where writing instruction is gradually shifting towards formative assessment and student agency, this relationship highlights the importance of promoting active feedback use as a foundation for developing self-efficacy in academic writing.

5.2 Feedback Engagement and Assessment Performance (H2)

The structural model revealed that feedback engagement directly predicted assessment performance ($\beta = 0.28$, $p = 0.002$). Learners who consistently engaged with teacher and peer feedback achieved stronger writing results and expressed greater confidence in their assessed work. This relationship suggests that performance outcomes in second-language writing depend on how much students engage with evaluative input as a resource for improvement, rather than passively receiving comments. The finding aligns with evidence from previous research, which shows that active engagement in the feedback process supports measurable progress in assessed writing quality. Vattøy et al. (2021) found that students who reviewed, discussed, and applied feedback produced more refined texts across successive writing tasks. Lu et al. (2024) similarly reported that feedback literacy influences achievement through behavioural and cognitive engagement. Ranalli (2021) and Zhang and Hyland (2025) observed similar trends in digital feedback environments, where sustained interaction with automated comments led to improved revision outcomes. Collectively, these studies confirm that writing performance is influenced less by the amount of feedback received than by learners' willingness to analyse and act upon it.

Within Saudi EFL classrooms, this connection holds additional pedagogical importance. Learners are often used to viewing teacher feedback as a judgment of ability rather than an opportunity for growth, a perception that hampers their engagement and subsequent performance (Saeed & Alharbi, 2023). When feedback becomes a dialogue instead of a one-way evaluation, students are more likely to internalise assessment criteria and make meaningful revisions. Research in local contexts supports this view: Alsahil et al. (2024) demonstrated that explicit guidance on interpreting and applying feedback improved students' writing outcomes, while Ismail et al. (2023) showed that formative assessment tasks foster autonomy and sustained effort. This link between engagement and performance also aligns with broader evidence that achievement in EFL writing develops through active participation in assessment processes. Hao and Lu (2024) found that engagement acts as the behavioural bridge between prior

achievement and future success, reinforcing the idea that growth in performance depends on how learners process evaluative feedback. In the current study, this mechanism was precise in how engaged learners achieved higher assessment scores and expressed greater confidence in their abilities. In the Saudi university context, fostering authentic engagement with feedback is therefore crucial for advancing writing achievement. When students see evaluative input as constructive information that guides revision and goal setting, assessment shifts from a final grading act to a formative process that nurtures continuous learning and ongoing writing development.

5.3 Writing Self-Efficacy and Assessment Performance (H3)

The analysis confirmed a significant positive relationship between writing self-efficacy and assessment performance ($\beta = .42$, $p < .001$). Learners with greater confidence in their ability to plan, organise, and revise their texts performed better in their writing assessments and felt a stronger sense of achievement. This outcome supports the idea that perceived competence is not a peripheral factor in second-language writing but a crucial psychological condition that influences how learners mobilise their linguistic and strategic resources during evaluation.

Research across second-language contexts consistently recognises self-efficacy as a key predictor of writing quality. Studies such as those by Bruning et al. (2013) and Golparvar and Khafi (2021) demonstrate that high-efficacy writers exhibit greater persistence and a more deliberate approach to revision. Camacho et al. (2021) similarly observed that motivational and behavioural dimensions of self-efficacy together explain variation in writing outcomes, while Fathi et al. (2021) found that self-assessment and peer-assessment activities strengthen both self-belief and performance. In EFL university contexts, Teng and Wang (2023) reported that students' self-efficacy directly predicts writing achievement, reinforcing the present study's finding that confidence drives measurable improvement. The current result also aligns with evidence from intervention studies. Cui et al. (2021) demonstrated that structured feedback training enhances self-efficacy, which in turn leads to higher writing quality. Similarly, Grenner et al. (2021) found that gains in self-belief were accompanied by improved text organisation among younger writers. Hao and Lu (2024) identified a similar mechanism in EFL writing, where self-efficacy mediated the effect of prior achievement on later performance, confirming its regulatory role in sustaining progress.

Within Saudi EFL settings, the relationship becomes especially significant. Many learners approach writing with limited confidence, influenced by exam-focused teaching and an emphasis on accuracy over idea development (Saeed & Alharbi, 2023). As self-efficacy increases, students demonstrate greater persistence in managing complex writing tasks and show a more substantial commitment to integrating feedback. Evidence from Al-Khresheh (2024) and Muhammad (2024) indicates that self-efficacy distinguishes successful writers from those who continue to struggle, confirming its role as a key variable in the Saudi context. These findings suggest that writing self-efficacy acts as both a motivational and cognitive factor in assessed performance. Learners who believe they can handle the demands of academic writing engage more actively in feedback utilisation, self-correction, and ongoing revision. Enhancing such confidence through formative assessment, constructive feedback, and reflective writing practices remains crucial for improving measurable writing outcomes in Saudi higher education.

5.4 Mediating Role of Writing Self-Efficacy (H4)

The analysis revealed that writing self-efficacy partially mediates the effect of feedback engagement on assessment performance ($\beta = 0.23$, $p < 0.001$). This relationship suggests that engagement with feedback indirectly supports writing achievement by strengthening learners' beliefs in their ability to handle the demands of writing tasks. Students who analyse and use teacher comments develop a stronger sense of control over their learning, which, in turn, leads to increased confidence and measurable improvement in their performance.

This pattern illustrates how feedback engagement and self-efficacy work together to influence outcomes in second-language writing. Vattøy et al. (2021) observed that active participation in feedback activities enhances students' awareness of their progress, while Teng (2024) confirmed that self-regulated learning strategies based on feedback experiences sustain both motivation and persistence. The current findings are also aligned with Camacho et al. (2021), who reported that motivation and behavioural effort jointly predict writing success, suggesting that efficacy beliefs mediate the link between engagement and performance. Similarly, Golparvar and Khafi (2021) found that confident learners employ more sophisticated revision strategies, correlating efficacy with the production of higher-quality texts. Comparable results are found in studies that integrate these constructs within structural models. Cui et al. (2021) demonstrated that peer and teacher feedback increased self-efficacy and internal motivation, leading to improved writing outcomes. Lu et al. (2024) identified feedback literacy as a prerequisite for engagement and subsequent performance, while Hao and Lu (2024) confirmed that self-efficacy functions as a mediator between prior achievement and later success. Taken together, this evidence highlights self-efficacy as the psychological mechanism through which engagement fosters lasting learning gains.

In the Saudi EFL context, where writing instruction is gradually shifting from product-oriented assessment to formative and reflective methods (Saeed & Alharbi, 2023; Alsahil et al., 2024), the mediating role of self-efficacy offers valuable pedagogical insight. Engagement with feedback fosters a sense of mastery, helping learners view assessment as a developmental process rather than a punitive one. As confidence increases, students become more resilient in facing challenges and more dedicated to revising their work with purpose. These findings confirm that writing self-efficacy acts as a motivational link connecting behavioural engagement with real performance outcomes. When feedback interactions build confidence, they establish the psychological conditions necessary for sustained learning, self-regulation, and long-term improvements in writing skills.

6. Theoretical and Practical Implications

The findings make a valuable contribution to understanding how learners develop writing skills in a second-language setting. The model confirms that engagement with feedback is not just a mechanical reaction to teacher comments but a cognitive and motivational process that fosters self-belief and enhances performance. Students who thoughtfully engage with evaluative input tend to internalise it as guidance for improvement, thereby boosting their confidence in handling complex writing tasks. This relationship provides empirical support for the notion that feedback and self-efficacy interact to influence achievement. The mediating role of self-efficacy also highlights the psychological pathway through which feedback leads to progress, demonstrating that the importance of feedback lies in how it fosters a sense of control and competence, rather than merely in its presence. These findings expand existing accounts of engagement and self-regulation in L2 writing by placing self-efficacy at the core of the learning process that connects behavioural effort with observable outcomes.

The study also has clear implications for classroom practice, particularly within Saudi EFL universities, where feedback is often seen as correction rather than dialogue. Teachers need to go beyond providing comments at the end of an assignment and instead create structured opportunities for students to discuss, question, and utilise feedback. When learners are guided to see feedback as something they can work with, rather than something imposed on them, they begin to take ownership of their progress. Designing iterative writing cycles that include peer exchange and guided revision would enable students to experience success through effort, reinforcing their confidence. At the same time, professional development for instructors should focus on how to frame feedback in constructive and motivating ways that support self-efficacy. Embedding formative assessment principles into course design would make feedback an integral part of learning rather than an afterthought, helping Saudi learners build the confidence and autonomy needed to sustain improvement in their academic writing.

7. Limitations and Recommendations for Future Research

Although this study provides a clear understanding of how feedback engagement and writing self-efficacy relate to perceived assessment performance, several limitations should be acknowledged. The use of self-report questionnaires means that the findings reflect learners' perceptions of their own engagement rather than their actual behaviour in feedback situations. Future research could compare self-perceptions with teacher evaluations or samples of students' writing to gain a more accurate view of performance. Since the data were gathered at a single point in time, the results indicate associations rather than developmental changes; longitudinal or intervention studies would help determine how feedback engagement and self-efficacy develop across writing tasks or semesters. The sample, drawn from Saudi universities, offers valuable insights into that context but may not be representative of learners in other systems; therefore, similar studies across different cultures and educational levels are recommended. Additionally, the study relied on perceived rather than actual performance scores, which may differ from objective outcomes; combining both types of data would strengthen future analyses. The exclusive focus on quantitative data also limits understanding of how learners interpret and apply feedback in real classroom settings. Qualitative methods such as interviews, reflective journals, or observations could capture these aspects. Finally, factors such as teacher feedback style, language proficiency, and task complexity were not included in the model but might influence engagement and confidence; future research should investigate these to develop a more comprehensive understanding of how feedback supports writing development.

8. Conclusion

This study aimed to investigate the relationship between students' engagement with feedback and their sense of writing self-efficacy, as well as their perceptions of assessment performance, in Saudi EFL university settings. The results show that students who engage actively and thoughtfully with feedback tend to develop greater confidence in their writing abilities, which in turn influences how they perceive their own achievement. Engagement with feedback affected performance both directly and indirectly through self-efficacy, indicating that the benefits of feedback go beyond immediate revision to the development of lasting beliefs about competence. These findings contribute to a deeper understanding of feedback as a learning and self-regulation process rather than a simple evaluative exchange. They also emphasise the importance of creating classroom environments where feedback is viewed as an opportunity for growth and self-reflection. Overall, the study provides evidence that meaningful engagement with feedback can act as a bridge between external input and internal motivation, allowing learners to approach writing with greater confidence, persistence, and independence.

Declerations

- ### Ethical Approval and Consent to Participate

Ethical clearance for the research was granted by the Institutional Review Board at University of Ha'il. Participants received a clear explanation of the study's purpose, procedures, and their rights before taking part. Written consent was secured from all respondents, and participation remained entirely voluntary. Confidentiality and anonymity were assured at every stage, with all data handled in accordance with approved ethical standards.

- ### Competing Interests

The author declares that there are no competing interests or potential conflicts of interest related to this research.

- **Funding**

No funding was received for this research.

- **Author Contributions**

The author conceived and designed the study independently, collected and analysed the data, and interpreted the results. All stages of manuscript preparation, including drafting and revision, were completed solely by the author.

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Not applicable

- **Disclosure of AI usage**

Grammarly Premium was used for language editing and proofreading.

- **Data availability statement**

The data supporting this study's findings can be obtained by contacting the corresponding author upon request.

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Appenedices
Appendix 1: Tools
Feedback Engagement Questionnaire (FES)

Behavioural Engagement with Feedback

1. I improve my work based on received feedback.
2. I use self-reflection to enhance and regulate my daily learning.
3. I read through marking criteria before taking an exam.
4. I study exemplars or teacher-recommended questions before doing my course assignments.
5. I plan and manage my studies according to teacher's guidance.
6. I resolve some problems in learning through use of online reference materials.
7. I observe how other students learn so that I may improve my learning strategies.

Cognitive Engagement with Feedback

1. If I can't understand received feedback at first, I keep going over it until I do.
2. I judge the quality of my work and figure out the extent to which it complies with requirements and whether further revision is needed.
3. I connect teacher's in-class guidance to my work and think where I did wrong.
4. When I read the feedback on my work, I can sort out the important and less important information.
5. Based on teacher's comments, I identify my areas of weaknesses in learning and figure out what to do next.
6. I analyse feedback from different sources and can recognise their value to my work.

Social Engagement with Feedback

1. I actively seek peer feedback in learning.
2. I actively seek teacher feedback in learning.
3. I participate in discussion and give feedback.
4. I am willing to share my ideas with others.
5. I value other people's feedback.
6. I provide feedback to those who are struggling in their studies.

Emotional Engagement with Feedback

1. I look forward to feedback on my coursework.
2. I enjoy receiving challenging feedback on my studies.
3. I do not feel frustrated when receiving negative feedback on my coursework.
4. I feel good when receiving teacher's feedback.

English Paragraph Writing Self-Efficacy Belief Scale (Adapted from Karafil & Oğuz, 2022)

Factor 1 – Writing Process and Rules (Items 1–17)

1. I can write an English paragraph that clearly matches a given topic.
2. I can create a topic sentence that conveys the main idea of a paragraph.
3. I can write supporting sentences that develop the topic sentence.
4. I can maintain coherence throughout a paragraph.
5. I can use appropriate transition words to connect ideas.
6. I can conclude a paragraph effectively.
7. I can use correct English punctuation marks while writing.
8. I can apply correct grammar rules in my English writing.
9. I can select vocabulary that fits the paragraph's purpose.
10. I can vary sentence structure to make my writing more fluent.
11. I can check and correct spelling errors in my writing.
12. I can plan my paragraph before beginning to write.
13. I can organise my ideas logically in the paragraph.
14. I can revise my paragraph to improve its clarity and accuracy.
15. I can evaluate whether my paragraph fits the task requirements.
16. I can combine ideas from different sources to create a cohesive paragraph.
17. I can integrate feedback to enhance my paragraph's quality.

Factor 2 – Self-Regulation (Items 18–33)

18. I can identify my strengths and weaknesses in English writing.
19. I can monitor my writing progress during a task.
20. I can set goals to improve my writing ability.
21. I can stay motivated to write even when I face difficulties.
22. I can manage my time effectively during writing tasks.
23. I can continue revising until my paragraph meets my standards.
24. I can maintain concentration while writing in English.
25. I can use strategies to overcome writing anxiety.
26. I can evaluate my writing critically before submission.
27. I can learn from feedback and apply it to future writing tasks.
28. I can maintain confidence in my writing ability after receiving criticism.
29. I can improve my writing through consistent practice.
30. I can reflect on my writing performance to plan for improvement.
31. I can monitor my emotions to stay focused while writing.
32. I can motivate myself to write even without external pressure.
33. I can recognise my progress in English paragraph writing.

Self-Efficacy for Learning and Performance Subscale (9 Items) (Adapted from Karafil & Oğuz, 2022)

1. I'm confident I can understand the most complex material presented by the teacher in this course.
2. I'm confident I can master the skills being taught in this class.
3. I'm certain I can understand the ideas taught in this course.
4. I expect to do very well in this class.
5. Compared with other students in this class, I think I'm a good student.
6. I'm sure I can do an excellent job on the assignments and tests in this class.
7. I think I will receive good grades in this class.
8. My study skills are excellent compared with others in this class.
9. I'm confident I can learn the basic concepts taught in this course.

Appendix 2: Supplementary material of Analysis

EFA for Feedback Engagement Scale

KMO and BTS for the feedback engagement scale (FES)

Test	Statistic	df	Sig. (p)
Kaiser–Meyer–Olkin (KMO) Measure	0.93	—	—
Bartlett's Test of Sphericity (χ^2)	3210.47	253	< .001

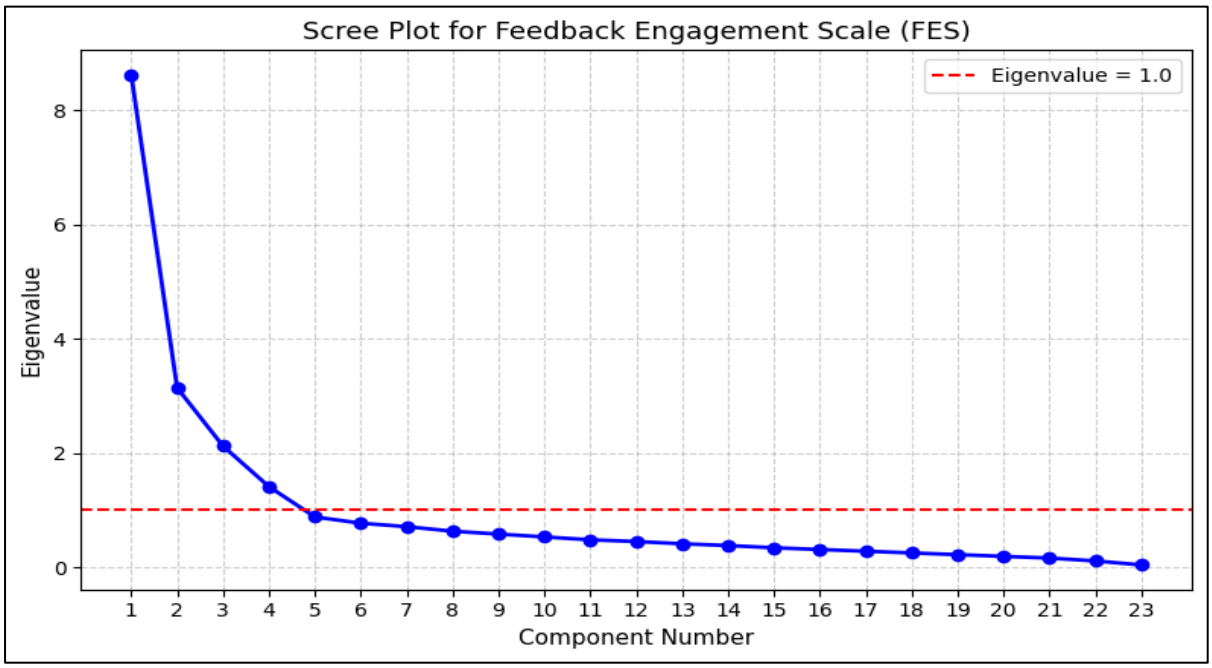
Total eigenvalue explained for FES

Component	Initial Eigenvalue	% of Variance	Cumulative %	Retained Factor
1	8.62	37.48	37.48	✓
2	3.14	13.67	51.15	✓
3	2.12	9.22	60.37	✓
4	1.41	6.12	66.49	✓
5	0.88	3.82	70.31	—
6	0.77	3.35	73.66	—
7	0.71	3.09	76.75	—
8	0.63	2.72	79.47	—
9	0.58	2.50	81.97	—
10	0.53	2.29	84.26	—
11	0.48	2.08	86.34	—
12	0.45	1.96	88.30	—
13	0.41	1.78	90.08	—
14	0.38	1.65	91.73	—
15	0.34	1.49	93.22	—
16	0.31	1.33	94.55	—
17	0.28	1.21	95.76	—
18	0.25	1.09	96.85	—
19	0.22	0.96	97.81	—
20	0.19	0.83	98.64	—
21	0.16	0.70	99.34	—
22	0.11	0.47	99.81	—
23	0.04	0.19	100.00	—

Rotated factor matrix for the FES

Items	Component			
	1	2	3	4
BE1	.78	.24	.18	.11
BE2	.72	.21	.17	.09
BE3	.69	.19	.22	.10
BE4	.74	.26	.20	.08
BE5	.67	.28	.19	.11
BE6	.33	.22	.25	.14
BE7	.71	.24	.27	.13
CE1	.19	.68	.16	.12
CE2	.22	.37	.18	.11
CE3	.17	.71	.23	.15
CE4	.16	.74	.18	.10
CE5	.20	.77	.20	.14
CE6	.23	.70	.19	.13
SE1	.19	.18	.75	.16
SE2	.21	.20	.73	.18
SE3	.22	.16	.70	.19
SE4	.20	.22	.68	.17
SE5	.15	.23	.36	.14

SE6	.18	.19	.65	.20
EE1	.11	.16	.20	.71
EE2	.12	.17	.18	.76
EE3	.10	.19	.16	.68
EE4	.09	.20	.18	.73



Scree plot for FES

EFA for Writing Self-Efficacy Scale

KMO and BTS for the writing self-efficacy scale (WSES)

Test	Statistic	df	Sig. (p)
Kaiser–Meyer–Olkin (KMO) Measure	0.96	—	—
Bartlett's Test of Sphericity (χ^2)	6145.28	528	< .001

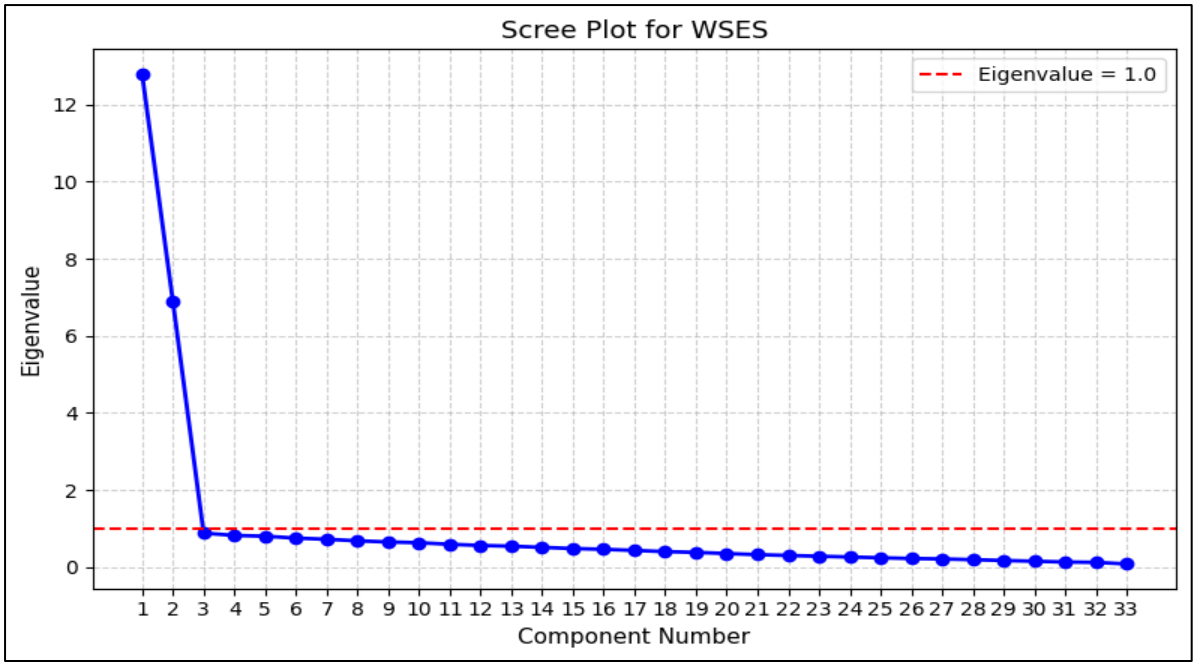
Total eigenvalue explained for WSES

Component	Initial Eigenvalue	% of Variance	Cumulative %	Retained Factor
1	12.80	38.79	38.79	✓
2	6.90	20.91	59.70	✓
3	0.88	2.67	62.37	—
4	0.82	2.48	64.85	—
5	0.80	2.42	67.27	—
6	0.75	2.27	69.54	—
7	0.72	2.18	71.72	—
8	0.68	2.06	73.78	—
9	0.65	1.97	75.75	—
10	0.63	1.90	77.65	—
11	0.59	1.79	79.44	—
12	0.56	1.70	81.14	—
13	0.54	1.64	82.78	—
14	0.51	1.55	84.33	—
15	0.48	1.45	85.78	—
16	0.46	1.39	87.17	—

17	0.43	1.30	88.47	—
18	0.40	1.21	89.68	—
19	0.38	1.15	90.83	—
20	0.35	1.06	91.89	—
21	0.32	0.97	92.86	—
22	0.30	0.91	93.77	—
23	0.28	0.85	94.62	—
24	0.26	0.79	95.41	—
25	0.24	0.73	96.14	—
26	0.22	0.67	96.81	—
27	0.21	0.64	97.45	—
28	0.19	0.58	98.03	—
29	0.17	0.52	98.55	—
30	0.15	0.45	99.00	—
31	0.13	0.39	99.39	—
32	0.12	0.36	99.75	—
33	0.08	0.24	100.00	—

Rotated factor matrix for the WSES

Item	**Component**	
	1	3
WPR1	.81	.18
WPR2	.84	.20
WPR3	.80	.22
WPR4	.77	.25
WPR5	.73	.21
WPR6	.75	.18
WPR7	.78	.19
WPR8	.83	.17
WPR9	.35	.29
WPR10	.70	.23
WPR11	.68	.26
WPR12	.38	.32
WPR13	.36	.35
WPR14	.74	.27
WPR15	.33	.38
WPR16	.39	.29
WPR17	.37	.34
SR1	.26	.77
SR2	.29	.74
SR3	.22	.78
SR4	.20	.72
SR5	.19	.70
SR6	.25	.69
SR7	.27	.38
SR8	.28	.37
SR9	.23	.75
SR10	.31	.39
SR11	.28	.36
SR12	.30	.73
SR13	.33	.38
SR14	.24	.71
SR15	.26	.35
SR16	.29	.74



Scree plot for WSES

EFA for Perceived Assessment Performance

KMO and BTS for the perceived assessment performance scale (PAPS)

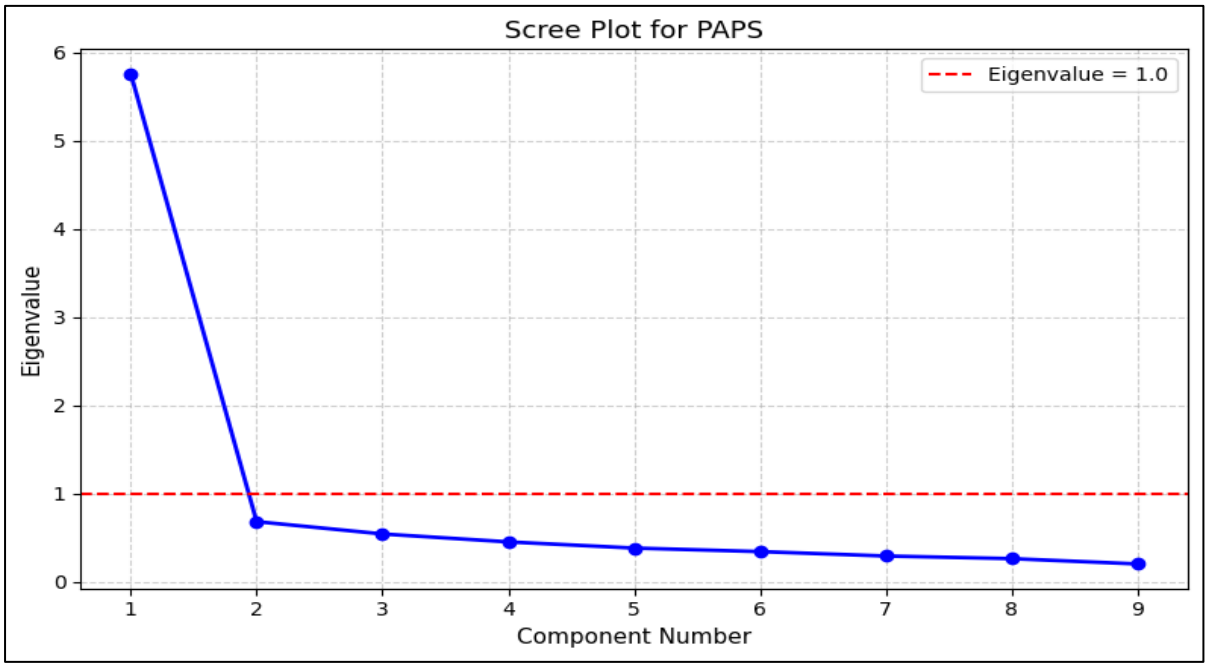
Test	Statistic	df	Sig. (p)
Kaiser–Meyer–Olkin (KMO) Measure	0.91	—	—
Bartlett's Test of Sphericity (χ^2)	985.42	36	< .001

Total eigenvalue explained for PAPS

Component	Initial Eigenvalue	% of Variance	Cumulative %	Retained Factor
1	**5.76**	**64.00**	**64.00**	✓
2	0.68	7.54	71.54	—
3	0.54	6.00	77.54	—
4	0.45	5.00	82.54	—
5	0.38	4.24	86.78	—
6	0.34	3.76	90.54	—
7	0.29	3.24	93.78	—
8	0.26	2.89	96.67	—
9	0.20	2.22	**100.00**	—

Rotated factor matrix for the PAPS

Item	Factor
PAPS1	.84
PAPS2	.87
PAPS3	.86
PAPS4	.82
PAPS5	.77
PAPS6	.88
PAPS7	.83
PAPS8	.70
PAPS9	.81



Scree plot for PAPS

Convergence and discriminant validity for FES

Constructs	AVE	α	CR	1	2	3	4
1 = Behavioral engagement	0.58	0.79	0.83	**0.76**			
2 = Cognitive engagement	0.68	0.81	0.88	0.47	**0.82**		
3 = Social engagement	0.62	0.80	0.84	0.51	0.42	**0.79**	
4 = Emotional engagement	0.63	0.78	0.81	0.54	0.45	0.39	**0.80**

Convergence and discriminant validity for WSES

Constructs	AVE	α	CR	1	2
Writing process	0.76	0.87	0.96	0.87	
Self-regulation	0.58	0.82	0.89	0.55	0.76

Convergence and discriminant validity for PAPS

Test	Value
AVE	0.67
α	0.87
CR	0.92

Descriptive Statistics and Normality Tests

Variable	Mean	SD	Skewness	Kurtosis
Feedback engagement	3.84	0.56	-0.42	-0.31
Writing self-efficacy	3.91	0.59	-0.37	-0.45
Perceived assessment performance	3.88	0.61	-0.28	-0.41