

Paving the Road to Writing Success: Self-efficacy, Metacognition, a Growth Mindset, and Academic Writing Performance among Indonesian EFL Students

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Article information

Abstract

Current research on the academic writing performance of EFL students has identified a number of robust factors. These factors include self-efficacy, metacognition, and a growth mindset. In the area of academic writing performance, however, there is a paucity of research combining these factors into a single study. In light of this, the purpose of this research was to conduct a structural model evaluation to investigate the relationships between self-efficacy, metacognition, a growth mindset, and academic writing performance. In this research, academic writing performance was situated within the context of EFL undergraduate thesis writing. The respondents of this study were 464 Indonesian students majoring in EFL education and literature from Central Java and Papua, Indonesia. In the data collection, an online questionnaire gauging the four variables was distributed. PLS-SEM 23 was used for data analysis. The findings of the structural model evaluation demonstrated that all assumptions established were accepted.

	The findings also revealed the statistically positive and significant associations among the predicted variables, namely self-efficacy, metacognition, a growth mindset, and academic writing performance. It is recommended that future studies construct a structural model of academic writing components by including other significant variables that may lead to learning differences.
Keywords	academic writing performance, growth mindset, metacognition, self-efficacy, EFL students
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1. Introduction

Academic writing is defined as a sort of two-way communication in which writers explore a subject in-depth and scientifically provide accurate information to readers (Çandarlı et al., 2015). In general, academic writing is seen as a type of writing that can be broken down into three parts: introduction, body, and conclusion. Writing an academic paper requires the writers to engage in logical and intellectual activities to comprehend and communicate the materials effectively. Academic writing takes on a more intricate and challenging nature because of the sequential processes that go into conceptualizing, making an outline, creating a draft, editing, and reworking the composition. It is necessary that all of these steps occur in order (Kiriakos & Tienari, 2018).

Among undergraduates, academic writing is most often associated with research or theses as the last requirement for a bachelor's degree (Weaver et al., 2016). When writing theses, undergraduate students should adhere to six key steps. These steps are deciding on the research direction by involving supervisors to determine the study's topic, deciding on the study participants, reviewing

related literature, conducting the study, creating drafts of the thesis, and revising and finishing the thesis before defending the thesis (Wu et al., 2017). Academic writing that is based on research is complex at every stage for its own unique reason (Huerta et al., 2017). Students often run into difficulties owing to a lack of awareness about academic writing rhetorical styles and inefficient compositions in the areas of both conceptual organization and linguistic construction. These issues might cause students to have a difficult time achieving their academic goals (Zaki & Yunus, 2015). In addition, the processes of data presentation and conversations can lead to students engaging in unnecessary rumination. According to Altınmakas and Bayyurt (2019), it is vital for students to retain long-term and active participation throughout each step of academic writing, along with the whole contents of these phases.

As a result of reviewing the findings of previous studies, it has been determined that the interventions of supervisors are among several external factors that catalyze the development of students' academic writing skills. The importance of supervisors' roles in guiding students while they compose academic papers was shown in Adamson's et al. (2019) research. In particular, they found that the roles of supervisors, including scaffolding students, engaging in ongoing discussions with students to assist with English and non-English resources, offering direct corrective and metalinguistic feedback, and helping students map their concepts, were all important in ensuring students' success in academic writing. The findings of the study that was carried out by Kuiken and Vedder (2021) demonstrated that it is beneficial to the improvement of students' academic writing abilities to offer a remedial program that is designed to extensively educate students whose academic writing competence has not met the ideal criteria. Miller and Pessoa (2016) propose that students receive direct instructions on how to organize their ideas for writing. They recommend that this instruction take place in the classroom. Following that, Suen's (2021) study showed that students' academic writing abilities improved as a result of their participation in a research-based academic writing workshop.

In addition to environmental factors, strong internal elements, including self-efficacy, metacognition, and a growth mindset, are required for academic writing's complex structure, which demands careful and analytical exercises of thought and language (Bai & Wang, 2023; Vincent et al., 2023). In this regard, a growth mindset is the conviction that one's innate intellect is malleable and can be enhanced via focused efforts (Blackwell et al., 2007). According to Truax (2018), an increase in students' desire to write can be attributed to the incorporation of a growth mindset into the feedback provided by teachers, in conjunction with truth-based compliments. Subsequently, a person's self-efficacy can be thought of as the degree to which he or she believes in his or her own ability to achieve the desired results through sustained efforts. People who have high levels of self-efficacy believe in themselves and their abilities to get desirable results. Hence, improving one's writing performance requires making an effort to build up one's self-efficacy and confidence in one's abilities to write in a given set of conditions (Huerta et al., 2017). In turn, the ability to reflect on one's own learning and the methods for efficiently regulating one's own cognitive or thinking activity in order to successfully accomplish the necessary academic tasks is referred to as metacognition (Chen & Hapgood, 2021). Given that it directs students how to build specialized procedures for addressing each component of writing, metacognition as a higher-order cognitive function has a major influence on writing outcomes. As the foregoing, metacognition encourages students to create specific approaches to their learning (Al Moqbali et al., 2020).

Over the last five years, several studies have emphasized the relationships between self-efficacy, metacognition, a growth mindset, and academic writing performance (e.g., Chakma et al., 2021; Grenner et al., 2021; Puryanto et al., 2021; Zhang & Zhang, 2024). Indeed, such studies have been very helpful in expanding our understanding of the significance of the four factors in writing. However, these variables were treated separately in each study or only partially integrated and no previous studies have focused on performing an exploratory investigation into the interactions between self-efficacy, metacognition, a growth mindset, and

academic writing performance as a whole in a single study. This is something that the researchers believe should be done. In addition, among the publications of Indonesian academics to this day, there has not been a single study that has had the aforementioned objective. Hence, the purpose of the present study was to conduct an exploratory analysis of the interactions between self-efficacy, metacognition, a growth mindset, and academic writing performance among English as a foreign language (EFL) undergraduate students within the Indonesian context who are accomplishing their thesis. As EFL lecturers in Indonesia, the researchers have deliberately decided to integrate the context of EFL undergraduate students into this research.

2. Literature Review

2.1 Self-Efficacy

Self-efficacy refers to a person's conviction in his or her own potential to succeed through the hard work he or she is willing to make, and self-efficacy is also seen as a component of motivation (Bandura & Schunk, 1981; Mitchell et al., 2021). Depending on the students' levels of self-efficacy and confidence in their capacity to complete the assignments, teachers may choose to approach the written work of the students in a variety of ways (Callinan et al., 2018). The term "self-efficacy in writing" refers to the author's confidence in his or her own ability to write, regardless of the circumstances in which he or she may be called upon to do so (Mitchell et al., 2017). In their study on writing self-efficacy, ideation, convention, and self-regulation, Bruning et al. (2013) introduced three dimensions of self-efficacy. The first dimension shows how self-efficacy may be used in the process of creating the ideas, concepts, and lines of reasoning that form the backbone of any piece of writing. The second dimension demonstrates a sense of competence when it comes to developing one's language skills, like in the case of writers who are able to articulate their thoughts via the careful selection of words, the construction of appropriate grammar, and the careful structuring of their speech. The third dimension relates to the author's self-efficacy in terms of self-management and emotional control comprising evaluations of the cognitive and

linguistic components of the work created. Recent research has shown that a person's sense of self-efficacy, i.e., an emotional or motivational component, is strongly connected to the growth of his or her writing abilities (Sabti et al., 2019). A similar finding has been reported by Han and Hiver (2018). However, while the importance of self-efficacy in fostering academic writing performance is acknowledged, it is essential to further explore the influence of other factors, such as metacognition and a growth mindset. This study can offer a deeper understanding of the complex relationship between self-efficacy and the aforementioned factors.

2.2 Metacognition

Metacognition refers to the awareness of students' own thinking processes, allowing them to reflect on their knowledge alongside techniques guiding their own cognitive activities to attain the intended learning objectives (Chen & Hapgood, 2021). To some extent, metacognition reflects students' autonomous abilities to plan, monitor, regulate, assess, and reflect on the outcomes of learning assessments (Cer, 2019). When writing, students use metacognition as a problem-solving technique (Briesmaster & Etchegaray, 2017). Writing is considered to be a complex and recursive process from a cognitive perspective. This process incorporates interactive actions connected to planning, producing an outline, writing a product, and editing the written work. All of these processes, including planning, monitoring, and evaluating, as well as self-regulation, are linked to the conscious control that students have over their assignments. As it directs students to establish techniques for addressing each aspect of writing, metacognition, which has a higher-order cognitive function, has a substantial impact on writing results. This is because it encourages students to create specific approaches to their learning (Al Moqbali et al., 2020).

Students who can demonstrate a high level of metacognition in their written works will be able to construct fruitful interactions, core assertions, and rationales for their written arguments. Such skills serve as the fundamental building blocks

of written works (Teng, 2020). In addition, metacognition gives students the tools they need to independently plan, monitor, and evaluate the written works they produce. It plays a crucial role in shaping writing outcomes by guiding students to develop specific strategies for each stage of the writing process and enabling them to construct coherent arguments and effectively evaluate their works independently. Therefore, this research intended to examine how metacognition interacts with other factors to predict academic writing performance.

2.3 Growth Mindset

The so-called fixed mindset is one of the factors impeding students' writing skill development (Dweck, 2006). Such a mindset prevents students from realizing their potential to improve their writing skills. To cultivate the best writing potential, students need to realize that their mindset can be shaped and co-constructed and that a mentality is not static but rather something that can be built and shared. According to Dweck (2006), a mindset is malleable and can be altered and shaped as desired; as a result, students have the choice of adopting a growth mindset in a specific area to attain the degree of ideal mastery that they have set for themselves. Having such a growth mindset is a strong indicator of using a wide variety of learning strategies (Amalia et al., 2023).

The notion "growth mindset" has to do with the conviction that one's intellectual capacity can be developed further via focused efforts, and it is a strong indicator of whether general learning tactics will be put into practice (Blackwell et al., 2007). Students' growth mindset has the potential to be a motivator for their learning progress because, after examining their most recent learning results, they will feel more confident in their abilities to learn. It is particularly crucial to have a growth mindset while writing since several phases of the writing process (including brainstorming, outlining, drafting, and rewriting) may be intimidating for certain students. As a result, students will have a better understanding of the complicated writing processes as the phases of learning that they need to undertake. When students develop the ability to learn on their own and adopt a growth mindset, they

concentrate their efforts on improving their writing. To increase students' growth mindset, teachers can give motivating talks and write constructive comments (Truax, 2018). Hence, the emphasis on fostering a growth mindset among students is crucial in overcoming fixed mindset barriers in the context of writing, as it empowers students to believe in their ability to improve their writing and motivates them to engage in effective learning strategies throughout the writing process.

2.4 Academic Writing Performance

Academic writing performance refers to the ability to demonstrate analytical and critical thinking during writing. In such a way, the writers apply their abilities to reason and persuade in scientific ways, comprehend the addressed issues, and build up their arguments in written works (Hyland, 2017). The aforesaid skills of writing are necessary since academic writing is more complex and more difficult than other forms of writing (Csizér & Tankó, 2017). They include the steps of coming up with ideas, organizing those ideas into a plan, outlining the plan, producing a draft, proofreading, and revising the draft. In this way, academic writers undergo a challenging and complex endeavor as they must use academic words, collocations, phrases, and grammatical complexities correctly and fluently (Alhassan & Wood, 2015). They must also be capable of mapping references related to the addressed discourse (Cumming et al., 2016) and constructing arguments based on good and understandable idea organizations resting upon the addressed discourse (Ebadi & Rahimi, 2018).

Academic writing performance in the context of university students pertains to research-based writing commonly known as thesis writing, which becomes the final step they must complete before completing their undergraduate studies (Weaver et al., 2016). It requires them to go through complex writing activities, such as determining definite topics of studies, deciding on subjects, reviewing related literature and conducting research, composing drafts of theses, revising the drafts, and finishing the theses (Cahyono et al., 2024; Huerta et al., 2017). Since academic writing requires a mastery of academic language, effective

organization of ideas, and rigorous referencing which are essential for scholarly discourse and research dissemination, it demands students to exercise the psychological factors that influence the success of writing. For that reason, this study examined the interplay among self-efficacy, metacognition, a growth mindset, and academic writing performance.

2.5 Interactions of Self-Efficacy, Metacognition, a Growth Mindset, and Academic Writing Performance from a Theoretical Perspective

Previous research, regardless of academic writing discourses, has examined the relationships among self-efficacy, metacognition, and a growth mindset. Zander et al. (2018) found that students with a sufficient growth mindset tended to possess a strong sense of self-efficacy. Rhew et al. (2018) provided more evidence for the validity of the aforementioned assumption within the context of education by elucidating how students with a growth mindset saw feedback and new information as opportunities to improve their learning and move toward their desired goals. In this regard, students who adopted a growth mindset were more likely to see setbacks and challenges as opportunities to learn and progress. Hass et al. (2016) proposed the argument that proper assessment of a growth mindset as a research variable requires direct inclusion of the theoretical markers of self-efficacy. This occurs due to the correlational nature of a growth mindset and self-efficacy.

While Oyelekan et al. (2019) showcased that self-efficacy is related to metacognition, Akamatsu et al. (2019) specifically demonstrated that self-efficacy mediates the relationship between learning behavior and metacognition. To add, Bai et al. (2021) demonstrated that a growth mindset, as a motivational variable, significantly predicts self-regulated learning, which shares a theoretical dimension with metacognition. The foregoing study was accomplished by showing that having a growth mindset is highly connected with getting engaged in self-regulated learning. The implicit theory of intelligence suggests that people with a growth mindset have greater confidence in their abilities to learn and acquire better

metacognition and metacognitive strategies. Metacognition, or one's ability to think about his or her own thoughts, may be improved by anybody with a growth attitude (Yeager & Dweck, 2012).

The core of a growth mindset is essential to writing due to the complex nature of the writing processes that might lead students to give up if they find the writing tasks challenging. Students who have adopted a growth mindset are likely to view the complex processes of writing as things to try out and pass on (Truax, 2018). Theoretically, the foregoing demonstrates that a writing growth mindset influences writing performance. The term "writing self-efficacy" refers to writers' confidence in their own skills of writing, which may include the use of many different strategies, techniques, and domain-specific knowledge depending on specific writing tasks at hand (Mitchell et al., 2017). Theoretically, writing self-efficacy is related to writing performance. According to Vincent et al. (2023), increasing one's self-efficacy or confidence in one's ability to write under certain conditions is a necessary endeavor for improving one's writing performance. Because it instructs students on how to build specialized ways for dealing with each component of writing, metacognition has a substantial impact on students' writing results because it drives them to write effectively (Al Moqbali et al., 2020). Students who develop metacognition to a high level can construct effective interactions, analytical arguments, and rationales for their written arguments, which become the fundamental building blocks of writing (Teng, 2020). Hence, what has been presented so far proves the clear theoretical link between writing metacognition and writing performance.

The researchers proposed the following hypotheses, which were based on the theoretical connections among self-efficacy, metacognition, a growth mindset, and academic writing performance:

H1: A growth mindset correlates with self-efficacy.

H2: A growth mindset correlates with metacognition.

H3: A growth mindset correlates with academic writing performance.

H4: Self-efficacy is associated with metacognition.

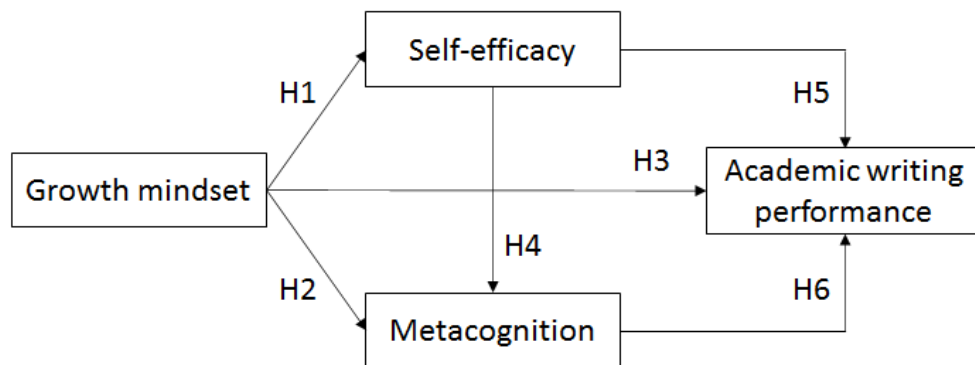
H5: Self-efficacy is associated with academic writing performance.

H6: Metacognition is associated with academic writing performance.

In the hypotheses, the researchers oriented the variable of writing performance as academic writing performance to situate this study within the context of EFL undergraduate thesis writing. The conceptual model of this study is shown in Figure 1.

Figure 1

Conceptual Model



3. Methodology

The current research aimed at carrying out an exploratory analysis of self-efficacy, metacognition, a growth mindset, and academic writing performance by testing six hypotheses prepared in advance. Figure 1 illustrates the conceptual model developed based on the formulated hypotheses.

3.1 Respondents

This study involved student respondents from eight universities in Indonesia. The respondents were selected purposively. Purposive sampling was chosen since it involves intentionally selecting participants based on specific qualities, without the need for underlying theories or a predetermined number of participants (Etikan et al., 2016). Respondents needed to be students enrolled in

an English education or English literature department, who were writing their undergraduate theses (see Table 1). A total of 464 students participated as respondents in this study.

Table 1*Demographic Information*

		<i>Number</i>	<i>%</i>
Gender	Male	83	17.9
	Female	381	82.1
Age	20 years	39	8.4
	21 years	105	22.6
	22 years	184	39.7
	>22 years	136	28.9
Academic fields	Literature	223	47.4
	Education	241	52.6
Daily social media usage duration	< 1 hour	50	10.8
	1-2 hours	71	15.3
	2-3 hours	75	16.2
	3-4 hours	89	19.2
	> 4 hours	179	38.6
Daily reading duration for books or academic research articles	< 1 hour	134	28.9
	1-2 hours	189	40.7
	2-3 hours	90	19.4
	3-4 hours	39	8.4
	> 4 hours	12	2.6
Daily notebook/laptop usage duration	< 1 hour	48	10.3
	1-2 hours	111	23.9
	2-3 hours	82	17.7
	3-4 hours	89	19.2
	> 4 hours	134	28.9

Table 1 displays demographic information about the respondents. The required sample size not only met the recommended minimum limit for path modeling, which requires ten respondents for each arrow, but also surpassed the

suggested starting point of 100-200 respondents for path modeling (Wong, 2019). This research received responses from a total of 464 students, consisting of 83 males and 381 females. They ranged in age from 20 to over 22 years old. The researchers investigated other demographic indicators, such as the amount of time spent on social media, reading books or research papers, and working on their laptops or notebooks. As seen in Table 1, the respondents spent a higher percentage of their time on social media each day compared to the time they spent reading articles or books.

3.2 Research Instruments

The online questionnaire distributed to respondents was adapted from previous studies. The questionnaire comprised items representing the variables of writing self-efficacy (Bruning et al., 2013), writing metacognition (Karlen, 2017), a growth mindset (Cooper et al., 2020), and academic writing performance (Razi, 2015). Each variable contained five questions, resulting in a total of 20 items. The content validation of the questionnaire was executed by involving two experts, namely university professors with disciplines in English language education and linguistics. Furthermore, based on the pilot testing of 60 students from one university in Central Java and one in Papua, the researchers further conducted the reliability and validity tests using the SPSS 23. Based on the measurements, the instrument was categorized as having a good degree of reliability with Cronbach's Alpha of .823, and each item was categorized as valid due to r values between .61 and .83 and the r table of .138 (Brown, 2002).

3.3 Data Collection

The data were gathered using a 5-point Likert Scale online questionnaire copied to a Google form. The questionnaire's links was distributed to students via WhatsApp groups in the first week of June 2023 with respondents typically spending approximately ten minutes to complete the survey. The online questionnaire followed ethical guidelines, including a consent form detailing the

study's purpose, data collection method, participant rights, and confidentiality. Respondents could access the questionnaire only after providing digital consent.

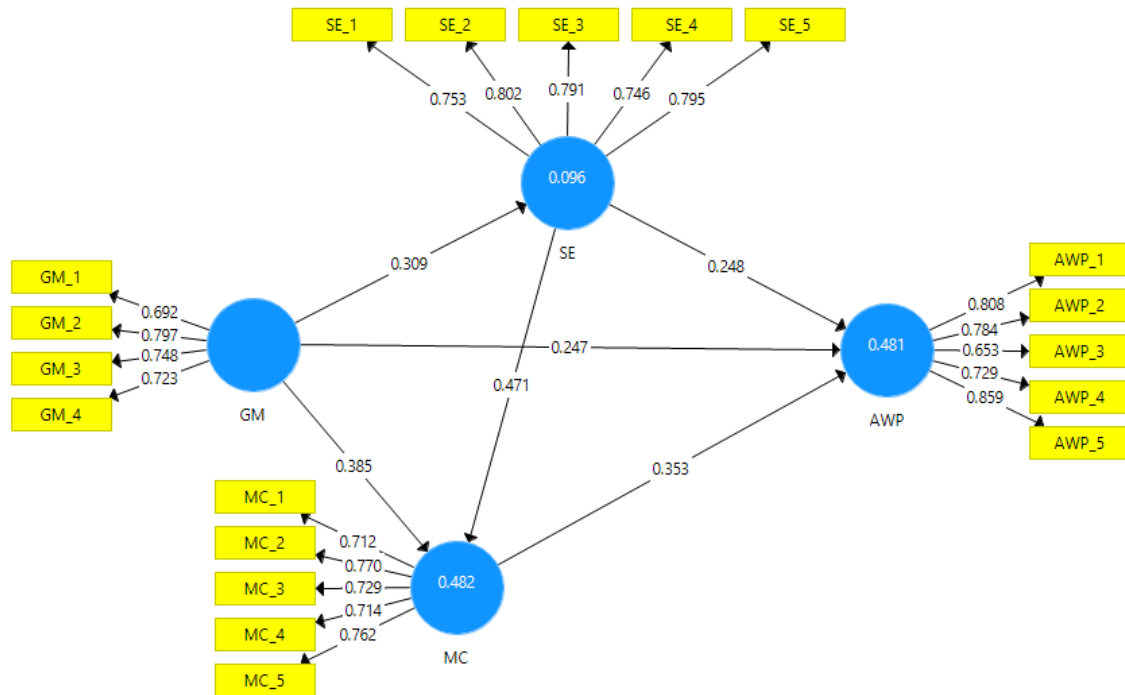
3.4 Data Analysis

This quantitative study explored the relationships among self-efficacy, metacognition, a growth mindset, and academic writing performance. Data analysis used PLS-SEM modeling with three stages, including model specification measurement, outer model, and inner model evaluation. The first stage was executed by constructing the inner and outer models (exogenous and endogenous constructs). The second stage was carried out with the composite reliability evaluation, convergent validity assessment, and discriminatory validity assessment. The final stage was coefficient analysis, cross-validated redundancy, path coefficient, and effect size.

4. Results/Findings

4.1 Model Specification

Model specification with confirmatory factor analysis constituted the initial stage of analysis (see Figure 2). In the designed model, the exogenous construct was a growth mindset (GM); the exogenous constructs, which at the same time also became endogenous constructs, referred to self-efficacy (SE) and metacognition (MC); and the endogenous construct was academic writing performance (AWP). The model specification had four inner models with 19 outer models. The model was categorized as a reflective model.

Figure 2*Confirmatory Factor Analysis of Reflective Model***4.2 Outer Model Evaluation**

The external model evaluation, which assessed indicators of reliability and internal consistency reliability, constituted the second phase. To evaluate the reliability indicator, the item loadings were calculated (see Figure 2) using a minimum threshold of 0.5 as suggested by Hair et al. (2016). Based on the assessment, dropping was carried out on the item loading of GM_5 because it had a value of .48. Furthermore, the remaining item loadings were categorized as feasible with values ranging from .692 to .859, so that the reliability indicator was established.

The internal consistency reliability of the instrument was then assessed in order to obtain the composite reliability values. A composite reliability value between .70 and .90 is considered acceptable. The analysis revealed that the composite reliability values ranged from 0.829 to 0.884, indicating good reliability. Details of these values are shown in Table 2.

Table 2*Composite Reliability and Average Variance Extracted (AVE)*

	Composite Reliability	AVE
AWP	0.878	0.592
GM	0.829	0.549
MC	0.857	0.545
SE	0.884	0.605

To ensure the model's validity, the assessments of convergent validity and discriminant validity were carried out. Convergent validity was utilized to determine the value of Average Variance Extracted (AVE), with a recommended threshold of greater than .50 (Kline, 2016). According to Table 2, the AVE values obtained ranged from .545 to .605. Thus, convergent validity was achieved. The final part of the second phase was to examine discriminant validity by looking at the modeling Ratio (HTMT) acquisition rate. The minimum necessary threshold was .85 (Henseler et al., 2015). In Table 3, the obtained values were in the range of .363 to .775. Thus, the discriminant validity had been achieved.

Table 3*Modeling Ratio (HTMT)*

	AWP	GM	MC	SE
AWP				
GM	0.633			
MC	0.775	0.663		
SE	0.636	0.363	0.712	

4.3 Inner Model Evaluation

In the third step, called the inner model assessment, the structural model that represented the connections between variables was evaluated, and the hypotheses included in the inner model were put to the test. To get the Variance Inflation Factor (VIF) value, the first part of the inner model assessment consisted of carrying out a collinearity test. This was done to get the results of the test. The

suggested VIF cut-off should be lower than 3 (Kock, 2016). The values of VIF that were obtained (as shown in Table 4) fell within the range of 1.000 to 1.931, which was a region in which there were no problems with collinearity.

Table 4

Variance Inflation Factor (VIF)

	<i>AWP</i>	<i>GM</i>	<i>MC</i>	<i>SE</i>
AWP				
GM	1.393		1.106	1.000
MC	1.931			
SE	1.534		1.106	

The second stage of the inner model evaluation was the coefficient determination used to obtain the predictive accuracy (R²) values in the model. The predictive accuracy values (Table 5) showed that only AWP and MC had substantial categories. These values were according to the recommended categories: great, moderate, and substantial (.75, .50, and .25) (Hair et al., 2014). The third stage of the inner model evaluation was to assess the cross-validated redundancy to get predictive relevance by calculating the Q² values in the inner model. In Table 6, there were two constructs with Q² scores that fell into the medium category (AWP and MC) and one construct that fell into the small (SE) category based on the category proposed by Hair et al. (2014), which had small (0.), medium (0.25), and substantial (0.50) categories.

Table 5

R-Square (R²) Value

	<i>R Square</i>
AWP	0.481
MC	0.482
SE	0.096

Table 6*Predictive Relevance (Q2)*

	SSO	SSE	Q² (=1-SSE/SSO)
AWP	1.255.000	913.718	0.272
GM	1.004.000	1.004.000	
MC	1.255.000	937.098	0.253
SE	1.255.000	1.189.560	0.052

The fourth stage of the inner model evaluation was the path coefficients assessment used to examine the hypotheses. The researchers determined that the constructs in the model had interrelationships by referring to the numbers in the path coefficient with the category from -1 (strongly negative relationship) to +1 (strongly positive relationship) (Hair et al., 2014). Table 7 shows that, based on the acquisition of path coefficient numbers, all paths in the model had strongly positive relationship values in the range of .247 to .471.

Table 7*Structural Model Assessment*

Path	β	M	SD	t	p	Significance
GM -> SE	0.309	0.317	0.056	5.499	0.000*	Supported
GM -> MC	0.385	0.392	0.052	7.356	0.000*	Supported
GM -> AWP	0.247	0.254	0.058	4.289	0.000*	Supported
SE -> MC	0.471	0.469	0.049	9.645	0.000*	Supported
SE -> AWP	0.248	0.249	0.060	4.111	0.000*	Supported
MC -> AWP	0.353	0.348	0.071	4.970	0.000*	Supported

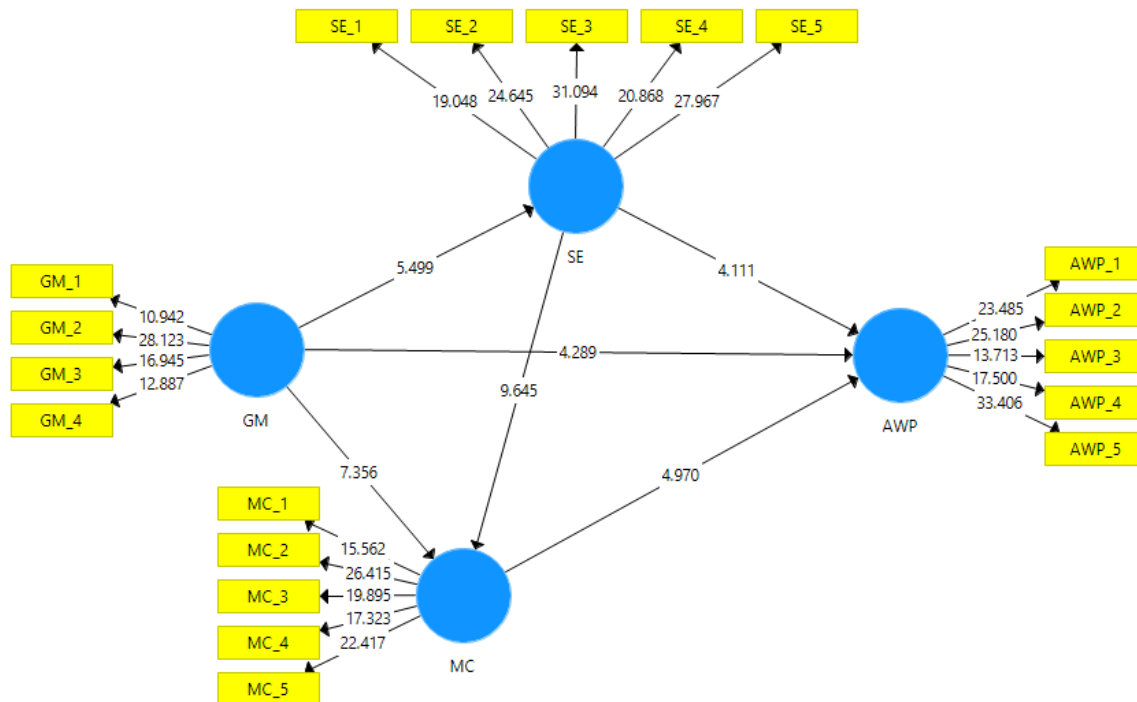
*p < 0.05

By doing bootstrapping with a significance level of 0.05 on the model, the researchers used the reference criteria for the accepted hypotheses which must have T Statistics of > 1.96 (Wong, 2013). Based on the obtained T Statistics (see Table 7 or path value in Figure 3), the researchers found that the six hypotheses were accepted. The growth mindset variable had positive, significant relationships

with self-efficacy ($p < 0.05$; $t = 5.449$; supporting H1), metacognition ($p < 0.05$; $t = 7.356$; supporting H2), and academic writing performance ($p < 0.05$; $t = 4.289$; supporting H3). Meanwhile, self-efficacy was also shown to have positive, significant relationships with metacognition ($p < 0.05$; $t = 9.645$; supporting H4) and academic writing performance ($p < 0.05$; $t = 4.111$; supporting H5). Furthermore, metacognition also had a positive, significant relationship with academic writing performance ($p < 0.05$; $t = 4.970$; supporting H6).

Figure 3

Structural Model Assessment



Finally, the effect size (f^2) of the confirmed hypotheses was evaluated as part of the internal model assessment (Table 8). The values of .02, .15, and .35 suggested minor, medium, and large effects (Hair et al., 2014), respectively, hence it was reasonable to infer that H6 had a big impact value. H2 had a medium effect value, and other hypotheses had tiny effect values. Finally, an important concept arose from the accepted hypotheses based on the data analysis. The researchers

were confident in the reliability and validity of the findings of this study because, convincingly, they deployed an error margin of 5% with a confidence level of 95%.

Table 8

Effect Size

	<i>AWP</i>	<i>GM</i>	<i>MC</i>	<i>SE</i>
AWP				
GM	0.084		0.259	0.106
MC	0.125			
SE	0.077		0.387	

5. Discussion

The first purpose of the study was to investigate the relationship between a writing growth mindset and writing self-efficacy. The analysis demonstrated that a writing growth mindset had a strong and positive relationship with writing self-efficacy ($p < 0.05$; $t = 5.449$). This indicates that the beliefs held by the students regarding the progressive improvement of their academic writing abilities through increased learning efforts and practices (Bai & Guo, 2018) significantly influence their confidence in their skills, strategies, and understanding of producing quality written works (Mitchell et al., 2017). The results of this study corroborate the strong correlation between a growth mindset and a heightened level of self-efficacy within the broader realm of education (Zander et al., 2018) and developmental psychology (Buenconsejo & Datu, 2020; Burnette et al., 2020; Derr & Morrow, 2020). The corroboration indicates that embracing a growth mindset impacts self-efficacy in both educational and developmental contexts. However, despite the shared findings, the current study offers a more distinct and targeted insight into academic writing within the realm of EFL learning and teaching.

The growth mindset regarding the enhanced academic writing skills through diligent learning and practice are of paramount importance in facing challenges and solving problems during the writing process. In the EFL context, it is evidenced

that students have encountered linguistic and rhetorical challenges in the process of composing academic works (Bram & Angelina, 2022; Mali, 2023; Santosa et al., 2024). Regarding this matter, the cultivation of a growth mindset that believes in the continuous improvement of writing skills and abilities through perseverance is pivotal to help students address the encountered challenges efficaciously. A growth mindset empowers them to confront their writing difficulties with resilience, enhancing their problem-solving skills. Consequently, they become confident in their abilities to generate new ideas, express them into writing, and exercise their self-regulatory strategies throughout the writing process (Bruning et al., 2013).

With such self-efficacy, students are likely to discover coping strategies and solutions when facing the encountered setbacks, rather than succumbing to them. These strategies and solutions are transferable to their upcoming writing tasks (Bram & Angelina, 2022; Subandowo & Utomo, 2023). Indeed, students' growth mindset fosters their commitment to deliberate and continuous academic writing practices and enable them to find a greater sense of enjoyment and determination in their writing journey (Ardi et al., 2024; Cheong et al., 2023). Hence, this study underscores the alignment between a growth mindset and writing self-efficacy, reinforcing the notion that students' growth mindset significantly influences their confidence in their abilities to accomplish academic writing tasks.

The second research purpose of this study was to find out the correlation between a writing growth mindset and writing metacognition. The findings underscored a significant positive correlation between embracing a growth mindset in writing and the development of writing metacognition ($p < 0.05$; $t = 7.356$). This suggests that EFL undergraduate students, who hold the belief that their academic writing skills could improve through sustained effort (Bai & Guo, 2018), demonstrate sufficient knowledge and control over all elements of academic composition (Al Moqbali et al., 2020). The findings of this study are largely consistent with those of previous research in the area of education and

psychology, confirming the connection between a growth mindset and metacognition (Ackerman & Levontin, 2023; Bai et al., 2021; Ploran et al., 2023). This confirmation underscores that a growth mindset has consistently emerged as a significant predictor of self-regulated learning, which becomes a fundamental aspect of metacognition. In this regard, individuals with a growth mindset tend to enhance their abilities and skills through metacognitive activities, such as planning, monitoring, regulating, assessing, and reflecting on learning processes, while those with a fixed mindset are less motivated to improve their abilities due to their beliefs of incapability (Ackerman & Levontin, 2023; Yeager & Dweck, 2012).

In the context of EFL writing, a growth mindset facilitates the exercise of metacognitive practices and stimulates increased levels of metacognition throughout the writing process (Bruning et al., 2013; Zhang & Zhang, 2024). Such a proactive and adaptive mindset encourages students to consider writing challenges as opportunities for growth and improvement rather than insoluble obstacles (Rhew et al., 2018). Consequently, students are likely to engage in metacognitive processes, such as planning and goal setting, to direct their efforts towards achieving writing outcomes (Chen & Hapgood, 2021). During the drafting stage, they exercise their awareness and monitoring skills by continuously evaluating and revising their writing drafts, while also employing self-regulatory strategies to manage their time and resources, and to solve any encountered problems regarding the complexity of EFL writing (Briesmaster & Etchegaray, 2017; Bruning et al., 2013). Their growth mindset prompts them to engage in critical reflection on the writing processes and outcomes, deepening their writing strategies and informing their approach to future writing tasks.

The third aim of this study was to gauge the correlation between a writing growth mindset and academic writing performance. The findings showcased a significant and positive correlation between a writing growth mindset and academic writing performance ($p < 0.05$; $t = 4.289$). This implies that EFL undergraduate students who believe in the improvement of their academic writing

abilities through effort investment tend to perform better in academic writing. Their growth mindset plays a pivotal role in supporting their writing performances across various stages of the writing process (Huerta et al., 2017). Indeed, writing demands the cultivation of a growth mindset due to its complex nature, involving various complicated processes, such as planning, drafting, editing, and revising, which can overwhelm students and lead them to feel discouraged and tempted to give up. Students with a growth mindset perceive these complex writing processes as opportunities for learning, wherein they must engage actively and purposefully in producing academic written works (Rhew et al., 2018; Truax, 2018). When students view challenges and barriers as integral parts of their writing endeavors, opportunities for growth are likely to emerge. By recognizing that these challenges can lead to the development of their academic writing skills, students maintain their writing performance in the face of obstacles and setbacks.

Students' growth mindset undoubtedly also influences how they employ their critical and analytical thinking to build ideas in their written works. Their sense of curiosity and openness encourages them to seek out new perspectives and insights to inform their ideas. In doing so, students critically evaluate information, analyze concepts, and synthesize different sources to develop well-crafted arguments in their discursive written works (Ebadi & Rahimi, 2018; Hyland, 2017). Since they view mistakes as opportunities for improvement, students are willing to explore creative and innovative ideas in their compositions. They are also open to receive feedback and to take initiative in the feedback process (Xu et al., 2023; Zhu et al., 2024). As a result, their written works are engaging and thought-provoking. Indeed, students' growth mindset influences either the process or product of academic writing.

The fourth objective of this study was to examine the correlation between writing self-efficacy and writing metacognition. The findings underscored a positive and significant correlation between writing self-efficacy and writing metacognition ($p < 0.05$; $t = 9.645$). This implies that EFL undergraduate students'

beliefs in their skills, methods, and knowledge about producing well-written works (Mitchell et al., 2017) drive the increases in their knowledge and control over dealing with each component of academic writing (Al Moqbali et al., 2020). When it comes to writing, metacognition serves as a problem-solving strategy that helps writers navigate many complexities of writing processes (Briesmaster & Etchegaray, 2017). Hence, based on the study findings, it can be assumed that EFL students who possess a considerable degree of self-efficacy regarding the composition of their academic works would be capable of employing self-regulated strategies to surmount diverse challenges encountered throughout the writing process.

The correlation between self-efficacy and metacognition highlighted in the present study aligns with previous studies. Akamatsu et al. (2019) have demonstrated that self-efficacy acts as a mediator between learning behaviors and metacognition, while Zhang and Zhang (2024) have reported that self-efficacy predicts the self-regulation of writing. The consistency of these findings accentuates that the EFL students who believe in their writing abilities are more likely to reflect on their writing goals, monitor their progress, and evaluate the effectiveness of their writing strategies (Rhew et al., 2018; Truax, 2018). Moreover, they are inclined to self-regulate their writing behaviors, such as managing their time, setting priorities, and adapting their strategies based on feedback (Xu et al., 2023; Zhu et al., 2024). Hence, the findings of this study emphasize that both writing self-efficacy and metacognition serve as pathways to successful writing.

The fifth objective of this study was to scrutinize the relationship between writing self-efficacy and writing performance. The findings showed that writing self-efficacy had a strong relationship with academic writing performance ($p < 0.05$; $t = 4.111$). It could be interpreted that EFL undergraduate students who were confident in their writing skills, research methods, and knowledge about producing high-quality written works (Mitchell et al., 2017) tended to demonstrate desirable competencies in various aspects of writing, such as determining research topics,

deciding on the research subjects, reviewing the literature, undertaking research, writing drafts, revising the drafts, and finishing their compositions (Huerta et al., 2017). The findings of this study echo those of previous studies by Han and Hiver (2018), Sabti et al. (2019), Sun and Wang (2020), and Vincent et al. (2023), which also highlight the predictive effects of self-efficacy on EFL writing performance.

One possible explanation for the consistent findings could be the role of self-belief in shaping students' attitudes toward academic writing tasks and their engagement in the writing process. It is undeniable that students with strong beliefs in their academic writing abilities are more likely to approach and accomplish writing tasks with enthusiasm, enjoyment, and persistence (Ardi et al., 2024; Cheong et al., 2023). Such psychological factors drive students to take committed actions to improve their writing skills. As a result, students make use of effective writing strategies to regulate their behaviors throughout the writing process, such as setting goals, managing time, and seeking feedback (Briesmaster & Etchegaray, 2017; Chen & Hapgood, 2021; Zhu et al., 2024). In doing so, they are actively engaged in their writing journey. Indeed, writing self-efficacy plays a critical role in fostering writing engagement, which subsequently improves writing performance.

The last purpose of this study was to investigate the correlation between writing metacognition and writing performance. The findings proved that writing metacognition positively and significantly correlated with academic writing performance ($p < 0.05$; $t = 4.970$). This means that the extent to which the EFL undergraduate students are knowledgeable and capable of controlling their strategies for working on all academic components (Al Moqbali et al., 2020) determines their performance related to determining the research topics, deciding on the subjects for the research, reviewing the literature, undertaking research, writing and revising drafts, and finishing the written works (Huerta et al., 2017). The influential role of writing metacognition in terms of academic writing performance has also been reported by previous studies (Aliyu et al., 2016;

Escorcia & Ros, 2019; Teng, 2020). The findings of the present and previous studies confirm that students with higher levels of self-awareness and reflection are more likely to develop coherent plans for their interactions, critical arguments, and written justifications (Ebadi & Rahimi, 2018). In this regard, as students plan, monitor, assess, and reflect on their writing processes, they are aware of different features and conceptual frameworks of excellent writing and finally produce written products that meet the needs of their intended readers in terms of genre-specific objectives and text organization (Hyland, 2017).

The findings of this study have highlighted that a growth mindset serves as the essential cornerstones in the pathways to EFL writing success, thus dictating pedagogical implications. Since the development of writing skills is not solely dependent on students' innate talents but also on their willingness to continuously exercise their writing, EFL teachers can leverage this understanding in designing strategies to foster students' growth mindset. They can initiate and cultivate a growth-oriented classroom culture that views challenges as opportunities for growth. In this regard, the provision of constructive feedback on students' efforts and progress during the writing process could enhance their writing efficacy (Lu et al., 2023), while the pre-notification of writing rubrics could assist them in monitoring their writing progress and achieving the best writing products (Arindra & Ardi, 2020). Hence, students' cultivated growth mindset in the classroom enhances their writing efficacy, metacognition, and academic writing performance.

6. Limitations of the Present Study

This study has successfully examined the six formulated hypotheses and proven that each hypothesis has been accepted by showing a positive and significant correlation between the variables assigned in each hypothesis. However, there were restrictions on the scope of this research. This study was limited to undergraduate EFL students from Central Java and Papua. Exploratory relationships among self-efficacy, metacognition, a growth mindset, and academic writing performance might have demonstrated different bootstrapping if more EFL

undergraduate students from various provinces with diverse demographic details had been involved. Despite the restrictions, the researchers made significant efforts to include as many EFL students from the two provinces as possible (464 respondents) so that the researchers could collect reliable and representative data. Hence, the researchers could successfully carry out an exploratory investigation into the six hypotheses that concerned interactional relationships among self-efficacy, metacognition, a growth mindset, and academic writing performance. The current research is distinctive because it took account of several latent factors at once in a single study as well.

7. Recommendation for Future Research

Further research is called for so that a structural model with more elements that go into academic writing may be built up. Other significant factors, such as personality characteristics or those that may lead to disparities in learning, should be included in such a prospective model. Researchers or those teaching writing may help students improve their writing skills and grades by exposing them to more reliable sources of information.

8. Conclusion

This research uses a structural model analysis to test six hypotheses on the interplays among self-efficacy, metacognition, a growth mindset, and academic writing performance. EFL undergraduate thesis writing is academic writing. As can be seen from the structural model analysis findings, there was a positive and statistically significant correlation between a growth mindset and self-efficacy in students' writing abilities. A constructive and substantial link existed between a growth mindset and writing metacognition. Academic writing success was positively and significantly related to adopting a growth mindset in writing. Having confidence in one's ability to write effectively correlated positively and significantly with academic writing performance. There was a favorable and statistically significant correlation between writing self-efficacy and writing outcomes in the classroom. Finally, there was a favorable and statistically significant correlation

between writing metacognition and academic writing performance. In the context of academic writing performance, self-efficacy, metacognition, and a growth mindset has been shown to be significant predictors of writing success.

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