Predicting factors impacting EFL students' writing competence: Examining the moderating effects of personal characteristics

Phe Quang Chu[1*], Trang Nguyen Hoang[1], Dao Thi Anh Vo[1]

[1]University of Finance - Marketing, Ho Chi Minh City, Vietnam
[*]Corresponding author: cq.phe@ufm.edu.vn

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ABSTRACT

This paper quantitatively predicts the factors that impact English as a Foreign Language (EFL) students' Writing Competence (WC), examining the multiple-level effects of three independent constructs (Environmental Factors [EF], Personal Beliefs [BL], Behavioral Factors [BF]) and three moderating variables (gender, academic performance, and self-study time) on EFL students' WC. The questionnaire was delivered to 85 EFL students at a university in Vietnam, and the findings show that the SRMR[1] index of the estimated model is .46, meaning a good fit. Hypothesis testing validated the positive causality between the exogenous constructs and their corresponding endogenous ones. In the direct relations, EF affects BL the most (75.1%), BF impacts WC (69.3%), and finally, BL influences BF the least (38.4%). In the indirect relations, EF affects WC the most (55.1%), then EF influences BF (28.9%) and finally, BL impacts WC the least (26.6%). The analytical result also revealed the moderating effect of gender on the relation between BF and WC. Still, the moderation of academic performance and self-study time on the relation between BF and WC was rejected. Finally, the authors discuss some major administrative measures to target if stakeholders wish to improve EFL students' WC.

1. Introduction

Collaborative Writing (CW) is a type of Collaborative Learning (CL) in which students work methodically in pre-arranged groups to complete an assigned task (Lin & Maarof, 2013). Storch (2011) defined CW as a collaboratively written text that results from the joint effort made by two or more students. In this sense, two or more students collaborate to write a single text, and that collaboratively written product manifests their team effort. Educationally, students' writing grows through the process in which the whole team works together to achieve a team goal or a co-authored text.

Previous research on CW was mostly based on quasi-experimental inquiry. The earlier findings indicate that experimental group students outperformed the control group (Anshu & Yesuf, 2020) or students collaboratively write better than those who work individually (Anshu & Yesuf, 2020; Pham, 2021). Particularly, CW was reported to enhance students' scores (Huynh, 2022), overall performance (Li, 2023; Nguyen & Phuong, 2021), writing skills (Alawaji, 2020;

[1]The Standardized Root Mean Square Residual

Helaluddin et al., 2023), accuracy (Phan & Dao, 2023), or fluency (Pham, 2021). In terms of text quality, CW was proven to improve students' content, organization, grammar, vocabulary, and mechanics (Khatib & Meihami, 2015), and Pham (2021) also pointed out that collaboratively written texts were shorter but more grammatically and lexically complex than individually written ones. In those studies, the improved learning results were traced to the efficacy of CW; therefore, most researchers praised CW as a new good approach to teaching English writing.

Earlier findings also show that those who are exposed to CW favor it. Pham (2021) reported that CW offers a motivating learning experience to learners and helps promote the student-centered approach, and Martín et al. (2020) claimed that CW is effective in writing learning in the dimensions of rich feedback, motivation, collaboration, satisfaction, and writing. Moreover, CW helps generate ideas, plan what to write, and provide peer feedback, which helps improve students' writing performance (Pham, 2021) and can be incorporated into a range of learning forms as an active process for learners (Helaluddin et al., 2023; Thai & Nguyen, 2022). Overall, the empirical evidence showcases that students hold positive attitudes toward CW (Alawaji, 2020; Huynh, 2022; Nguyen & Phuong, 2021) and actively respond to it whenever it is administered in class (Helaluddin et al., 2023).

CW studies conducted to understand the effects of CW on students' writing in terms of their improved learning relied on Vygotsky's social-cultural theory as the foundational theory (i.e., Pham, 2021; Thai & Nguyen, 2022). Moreover, although studies on the effects of CW on students' learning results have been done quite a lot, both in Vietnam and in foreign countries, little has been researched to explore the CW factors that affect EFL students' WC. In addition, a survey supported by Bandura's Social Cognitive Learning Theory (SCLT) (1989) to determine the CW factors that hierarchically impact EFL students' WC was completely absent in the CW literature. In response, the authors of this study decided to adopt Bandura's Triadic Reciprocality Determinism (TRD) (1989) as the framework to investigate the CW factors that impact EFL students' WC.

This is a new approach to exploring the CW factors that influence EFL students' WC when BF is believed to affect WC directly; meanwhile, EF and BL indirectly influence WC under the light of Bandura's SCLT (1989). The findings of this study that provide the systems information on the CW factors that affect students' writing answer the following questions:

1. What collaborative writing factors affect EFL students' writing competence?

2. How do personal factors moderate the relation between behavioral factors and writing competence?

2. Literature review

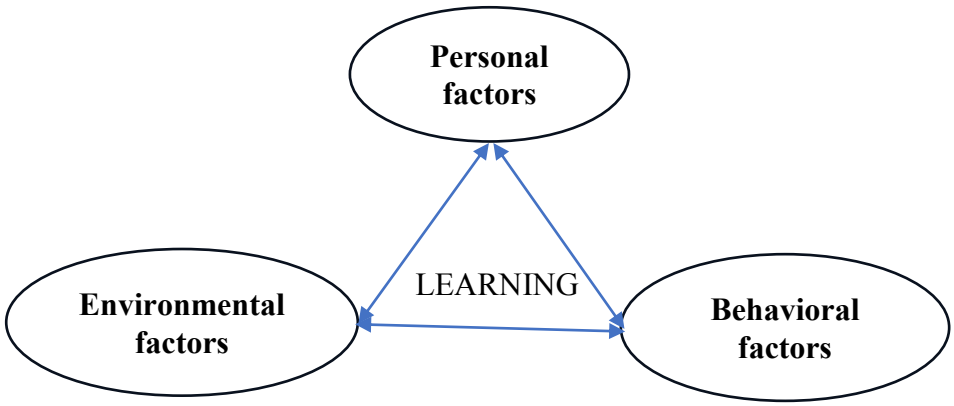
Earlier researchers reported the efficacy of CW on students' achievements and considered it a good approach to English writing. Their findings mostly focused on students' characteristics, peer influences, and teacher agencies that affect students' CW (Phan & Dao, 2023). For the CW environment, Putzeys et al. (2024) reported that besides students' attitude, ability, and task approach, CW is influenced by students' familiarity and prior collaboration with peers. Nevertheless, extant literature exhibits that the CW factors influencing EFL students' WC, especially in the EFL context of Vietnam, are under-researched. In response, the authors of this study decided to explore the CW factors impacting students' WC in light of the TRD (Bandura, 1989).

Bandura's SCLT (1989, 2002, 2009) posited that learning is vicarious, cognitive, self-reflective, and self-regulatory. Moreover, his TRD (1989) explained that people's learning is

reciprocally influenced by the bidirectional interactions of personal, behavioral, and environmental factors as diagrammed in Figure 1.

Figure 1

Bandura's Triadic Reciprocality Determinism (1989)

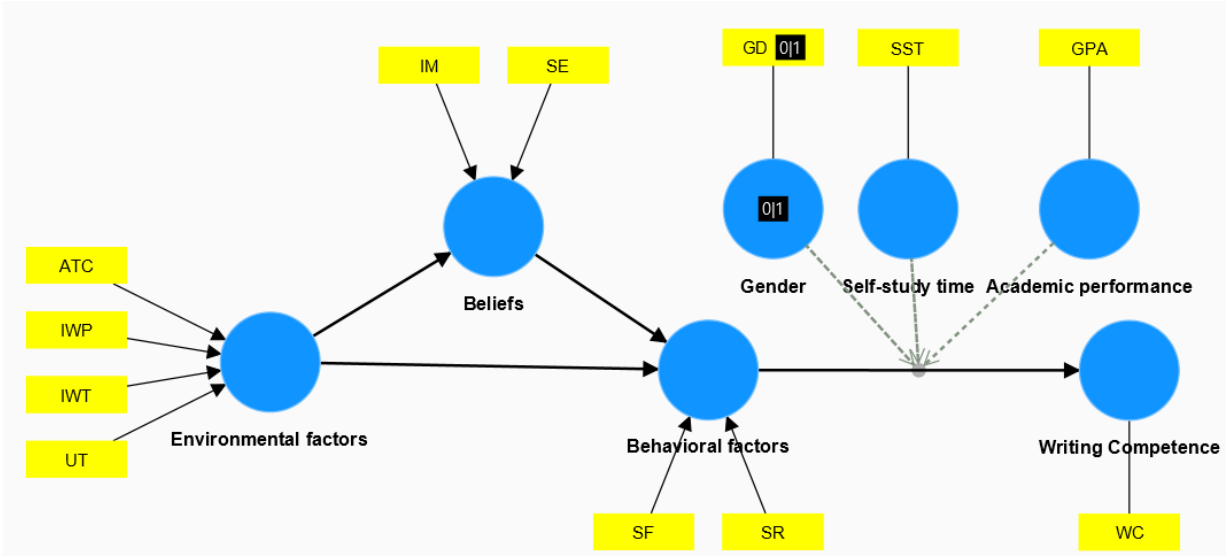


Source. The data are from "Social cognitive theory" by A. Bandura, 1989, *Annals of Child Development*, pp.1-60

In this study, the authors made a change to Bandura's TRD (1989) to explore the causal relationship between the CW factors and EFL students' WC in the sense that BF is theorized to be the direct predictor of WC, while it is affected directly by BL and indirectly by EF. In another dimension, the relation between BF and WC is hypothesized to be moderated by their personal characteristics: gender, academic performance, and self-study time. The contents of the hypothesized research model (Figure 2) are presented below.

Figure 2

Theorized Research Model



Source. The data are from "Social cognitive theory" by A. Bandura, 1989, *Annals of Child Development*, pp.1-60

Environmental Factors (EF) make the social and physical environment in which students experience their learning with multiple affordances. Bandura (2002, 2009) emphasized the social aspects of an environment such as classroom conditions, teachers, and peers. In this study, the authors relied on Bandura's SCLT (1989) to define EF from the agentic perspectives of students' interaction with their teacher, peers, use of technology, and attitude toward the course.

Personal Factors (PF) are individuals' mental characteristics and processes such as experience, cultures, expectations, beliefs, self-perceptions, goals, and intentions or their biological properties such as age, gender, race, and physical attractiveness (Bandura, 2002). In this study, the authors decided on EFL students' Personal Beliefs (BL) as independent constructs and their personal characteristics as moderators. Particularly, BL was observed through EFL students' self-efficacy and motivation.

Moreover, people's learning and development are related to their mental and physical characteristics (Bandura, 1989). In some previous research, students get higher scores when they spend more time studying (El-Omari, 2016; Limp & Alves, 2017), have more experience in studying English (Limp & Alves, 2017; Mushtaq & Khan, 2012), or engage more in the study program (Alsayed, 2003; Duwal & Khonju, 2020). This hints that people's learning is directly impacted by their own characteristics; thus, the authors focused on gender, academic performance, and self-study time as *moderating variables*.

Behavioral Factors (BF) refer to people's actual acts which are proactive, self-reflected, and self-regulated (Bandura, 2002). Bembenutty et al. (2016) also claimed that "individuals are competent and active agents whose actions can influence their development, learning, and behavior" (p. 216). In Bandura's concept of knowing and development (1989), people's learning is self-regulated and self-reflected. Therefore, BF in this study was measured through students' self-regulation and self-reflection

On the whole, the new feature of the hypothesized research model is that the causative factors of CW are arranged in a multiple-layer order under the light of Bandura's TRD (1989). Specifically, students' WC was hypothesized to be affected by their behavior which is, in another layer, influenced by their beliefs and the environment. Furthermore, three major moderating constructs were added to assess how WC was differentiated by their personal traits.

3. Theoretical model

3.1. Dependent variables

Competences describe students' desired knowledge, skills, and behaviors when completing a program or course (Kennedy et al., 2006). Oxford also defines competence as "the ability to do something well" and performance as "how well or badly you do something" (Oxford, 2019). In this sense, competence is formed through teaching and learning and is manifested in their performance.

Earlier researchers deployed the students' actual score or GPA[2] (i.e., Ramirez-Arellano et al., 2018) or progress score (i.e., Huynh, 2022) as the realization of their learning results, and a high score is normally associated with good learning results. In this study, the authors employed EFL students' progress scores as their manifested WC, which was examined through four components: *task fulfillment organization*, *vocabulary*, and *grammar*. They are the four specific writing competencies, on which VSTEP[3] raters grade test-takers English writing papers in Vietnam (MOET, 2015). Accordingly, the progress scores were categorized into five groups: 1 (below 4), 2 (4.0 to 5.4), 3 (5.5 to 6.9), 4 (7.0 to 8.4), and 5 (8.5 or higher). The score categorization was suggested by MOET (2021).

[2]grade point average
[3]Vietnam Standardized Test of English Proficiency

3.2. Independent variables

3.2.1. Attitude to the course

Researchers agree that attitude is a good predictor of behavior. Ajzen (1991) defined it as "the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (p. 188). Davis (1989) added that attitude refers to the negative or positive feelings of performing a behavior and results in behavioral intention of performing a behavior.

In this study, the authors explored the construct of attitude toward technology use suggested by Davis (1989), Callum (2011), which was replaced by Attitude to The Course (ATC) in the CW context. As ATC focuses on EFL students' emotional reactions toward the entire course, it was measured through their preference for the CW-based course, the appropriateness and fruitfulness of CW, and the interesting content.

3.2.2. Interaction with the teachers

Interaction With the Teachers (IWT) refers to the degree to which students interact with their teachers for their learning needs (Qureshi et al., 2021). Empirically, students are impressed or inspired by their teacher, which may lead to improved learning, attitude, and results (Mushtaq & Khan, 2012; Nguyen & Le, 2018). Engin and Seven (2007), Rahman et al. (2017) also affirmed that teacher attributes are the important factors impacting the quality of the teaching and learning process.

The observations in this study showed that students were interested in the content and activities the teacher offered. The interviews with the students also showcased that they were impressed by the teacher's hard work and timely assistance during the course; as a result, the authors developed a scale to measure their perception of how the teacher influenced their writing in terms of his teaching methods, care for students, encouragement and relations with his students.

3.2.3. Interaction with peers

Interaction With Peers (IWP) is the degree to which students collaborate to complete a learning task (Qureshi et al., 2021). IWP is likely to enhance CL and learning performance among students within a group (Blasco-Arcas et al., 2013) because knowledge is gained thanks to shared and exchanged information. Moreover, IWP motivates learners to discuss; thus, it is significantly associated with active CL of students (Qureshi et al., 2021).

Class observations in this study exhibited that students generated, shared, and exchanged ideas, provided and received feedback, and then proofread and sometimes revised the draft for one another. The interview also indicated that they were interested in CW, which could lead to improved learning results. Therefore, the authors examined EFL students' interactions with their peers in the light of exchanging ideas, improving language use, giving feedback, and developing new skills and learning abilities.

3.2.4. Use of technology

Use of Technology (UT) is the degree to which students use technology in their learning activities (Venkatesh et al., 2003). Furthermore, Sarwar et al. (2019) found that technology use motivates students' learning through which their learning results can be increased. More recently, UT was found to affect students' English learning results (Nguyen & Chu, 2021), and in an online CW course, it was reported to improve students' writing performance (Thai & Nguyen, 2022).

UT is part of a classroom nowadays, which impacts CW and WC (Chu, 2023). Moreover, Qureshi et al. (2021) examined the effects of social media use on students' learning results, reporting that UT encourages their engagement in in-class activities, which results in improved achievements. Thus, this study measured UT in terms of students' use of ICT for entries, communication, collaboration, and revision.

Theoretically, Bandura (1989) claimed that the environment consists of the facilities, the teacher, and peers; therefore, the authors grouped UT, ATC, IWP, and IWT as a higher-order construct named EF. Then, the relations between EF and its endogenous constructs are hypothesized below.

H1: EF affects BL directly

H2: EF affects BF indirectly

H3: EF affects WC indirectly

3.2.5. Self-efficacy

Self-Efficacy (SE) was defined as people's belief in their abilities to organize and execute courses of action to produce attainments (Bandura, 2002; Pajares et al., 2009). SE in English writing refers to writers' confidence to achieve specific writing skills or complete a writing task (Pajares et al., 2009); moreover, Limp and Alves (2017) added that students' confidence in their writing capabilities influences their WC.

SE was found to influence students' intentions and actions directly (Callum, 2011; Nguyen & Chu, 2021) or learning results (Chu, 2022; Nguyen & Le, 2018); nonetheless, SE in this research is estimated to affect WC indirectly. The scale of SE was validated by Callum (2011), Qureshi et al. (2021), and the authors adapted it to make it fit for the CW context. Particularly, SE is observed through students' confidence in CW and gaining the set objectives.

3.2.6. Intrinsic motivation

Intrinsic Motivation (IM) is defined as people's self-determination, competence, task involvement, curiosity, enjoyment, and interest (Callum, 2011). Brown (2000) claimed that intrinsically motivated people target certain internal rewarding results such as competence and self-determination. In Bandura's view (2009), people normally pursue activities that they find self-satisfying and that give them a sense of worth but reject those they disapprove of. Therefore, it can be inferred that IM is an important predictor of one's behavior or act.

Rahman et al. (2017) affirmed that a good inner condition could lead to good learning results. Empirically, Callum (2011) gauged IM via students' interest in the challenges of the learning task, which impact their use of social media in learning; nonetheless, the class observations and interviews showed that students were interested in English writing, CW, the enjoyment of the task and the creation of the meaning in writing.

3.2.7. Extrinsic motivation

Extrinsic Motivation (EM) refers to such mental factors as competition, evaluation, recognition, grades, and constraints (Callum, 2011). Brown (2000) added that "extrinsically motivated behaviors are carried out in anticipation of a reward from outside and beyond the self" (p. 164). Concerning social influences, Bandura (2002) also discussed that people are motivated by the successes of others. EM in earlier research was explored as a direct predictor of students' learning results, their learning attitude, or their learning engagement (Callum, 2011; Sarwar et al., 2019).

EM in this research, however, is theorized to impact EFL students' behavior directly and WC indirectly. To measure EM, the authors of this study drew on the findings of observations and interviews that students were motivated by social presence, future usefulness of the course content, and recognition of peers.

Under Bandura's SCLT (1989), the authors grouped SE, IM, and EM to form BL as a higher-order construct. Grouping those lower-order constructs was theoretically based on Hair et al.'s statistical calculation (2017). The hypotheses about BL and the other constructs in the theorized model are stated below.

H4: BL affects BF directly

H5: BL affects WC indirectly

3.2.8. Self-regulation

S*elf-Regulation* (SR) indicates that people control and direct their thoughts, emotions, motivation, and actions toward their set goals (Bandura, 2002; Brockett & Hiemstra, 1991). Nabavi (2012), Limp and Alves (2017) added that when individuals self-regulate their learning, they think and behave in response to the environment to achieve their goals. This hints that SR is present in a cognitive and behavioral process of one's learning, Brockett and Hiemstra (1991) argued that students adopt SR to improve their skills, knowledge, and expertise. In this sense, SR is a cognitively driven behavior that helps students self-regulate their learning activities.

In this study, SR was partly adapted from McCoach and Siegle's (2003) established scale. While McCoach and Siegle (2003) approached SR in light of learning strategies, accountability, and staying focused on studying and completing in-class tasks, the authors largely deployed the interview and observation of students' CW practices. The findings focused on using different resources, engaging in-class activities, reviewing teacher and peer feedback, and revising their draft.

3.2.9. Self-reflection

Self-Reflection (SF) refers to the facts that students reflect on what they have acquired at certain points of time in their learning process in terms of gained knowledge, skills, and competence (Bandura, 2002; Brockett & Hiemstra, 1991; McCoach & Siegle, 2003). Bandura (2002) explained that people are the agents of actions as well as the examiners of those actions, and Pajares et al. (2009), Limp and Alves (2017) posited that through SF, students can measure how much they have achieved compared to the set objectives.

Those arguments indicate that SF is a cognitive factor that can help students gauge their learning progress and self-direct their learning toward the set goal. Empirically, McCoach and Siegle (2003) treated SF as a significant determinant of academic achievements, while Ramirez-Arellano et al. (2018) proposed that SF indirectly affects learning outcomes via learning strategies. In this study, the authors adopted Chu and Nguyen's SF (2020) in combination with empirical evidence from the observations and interviews to measure students' thoughts about being able to study writing through CW, comprehending the benefits of CW, and finding ways to improve writing learning better with CW.

To help the statistical calculation under the light of Bandura (1989), Hair et al. (2017), SR and SF were grouped to make BF a higher-order construct. Bandura (1989) argued that BF impacts WC directly; accordingly, the relation between BF and WC is hypothesized below.

H6: BF affects WC directly

3.2.10. Gender

Gender (GD) is a qualitative variable theorized to moderate the relation between BF and WC. Empirically, Nguyen and Le (2018) asserted that GD impacts students' English learning. Furthermore, Pervaiz et al. (2018) affirmed that female students are more intrinsically motivated than male students as they want to know new things and are curious about new and better things; differently, males are more extrinsically motivated than females, which might lead to different learning results. Thus, GD was hypothesized to influence students' writing results as follows.

H7: GD moderates the effect of BF on WC

3.2.11. Academic performance

Academic Performance (AP) refers to students' English proficiency and in this study, AP is represented by EFL students' self-reported GPAs. Nguyen and Le (2018), Chu and Nguyen (2020) pointed out that students of different ability groups were affected by their determinants differently, indicating that students' writing is affected by CW differently. As a result, AP was employed as a moderator to see how it affects the relationship between BF and WC.

To serve the calculation, students' GPAs worked as a continuous scale, categorized into five groups: poor students (below 4), below average students (4 - 5.4), average students (5.5 - 6-9), good students (7 - 8.4), and distinction students (8.5 or higher). The coding of students' GPAs is based on MOET (2021), and the hypothesis about AP and the other constructs is stated below.

H8: AP moderates the effect of BF on WC

3.2.12. Self-study time

Self-Study Time (SST) refers to the amount of time students spend studying by themselves after school. In previous studies, SST was examined as a direct predictor of students' learning results. The findings show that those who spend more time on their self-study get better learning results (i.e., Nguyen & Le, 2018), or more autonomous students outperform less autonomous students (i.e., El-Omari, 2016). Nevertheless, the different point is that SST in this research would be explored as a moderator.

To make it work for the calculation, SST is divided into five groups: 1 (not at all), 2 (below four hours a week), 3 (four to below eight hours a week), 4 (eight hours to below twelve hours a week) and 5 (over twelve hours a week). The division of SST is largely based on the 2022 Syllabus on Business English Writing, which requires students to do two hours of self-study for each in-class hour. Regarding the relation between SST and the other constructs, a hypothesis is stated below:

H9: SST moderates the effect of BF on WC

4. Research methodology

4.1. Approach and procedure

This study was based on the sequential exploratory mixed methods research design, in which Creswell and Creswell (2018) posited three phases: the first phase is done qualitatively to build up the features in the second phase, which will be tested in the last phase.

At the beginning of the research, the authors explored the previously published resources on CW, Bandura's (1989, 2002) social cognitive theory, and WC to get theoretical and empirical ground for the constructs. In the second phase, they targeted a writing course in which CW was applied to teach English writing to 85 students in two classes. Finally, the questionnaire was piloted for reliability and validity before being administered officially.

In short, the qualitative data mostly informed the questionnaire survey launched in the last phase of the research project. This also means that quantitative data played a key role in helping the authors address the research questions.

4.2. Research setting and participants

The study targeted English major students' Business English Writing at a university in Vietnam in 2024. In this course, CW occurred as part of the classroom pedagogy where EFL students worked together to produce both individually and collaboratively written texts. In some activities, they worked collaboratively to write part of a letter, but in many others, they collaborated to write a complete letter.

As planned, the qualitative research focused on five students in the CW environment, and the quantitative research involved 85 students. The descriptive statistics show that 82% of the survey respondents were females, and 93% were in their second year. Before Writing 3, the sample had been familiar with CW in learning to write English essays.

4.3. Data collection and analysis

The research model consisted of ten constructs measured via 42 indicator variables. Constructing the variables was drawn partly from the previous scale (i.e., McCoach & Siegle, 2003; Qureshi et al., 2021) and partly from the fieldwork in the CW context. The authors observed five students' activities in a CW environment six times and conducted unstructured interviews with these five students to reword the indicators and make them CW-specific. While the observations focused on the CW environment and the student's behavior, the interviews deepened their beliefs and recall of what they did with peers and the teacher to handle writing tasks. The qualitative data collection was under the direction of the theorized constructs (Figure 2).

The questionnaire (*Appendix A* (online version)) is the major tool to address the research questions, and the students were requested to respond to it via Google Forms. A week before the course ended, the questionnaire was administered with the participation of 30 students, which helped the authors revise inappropriate questions. On the last day of the course, it was delivered again, and 85 responses were recorded. When the data was ready, the authors used Smart-PLS to handle the statistics, as Hair et al. (2017) suggested.

5. Findings and discussion

5.1. Data analysis and findings

5.1.1. Measurement model assessment

The authors assessed the measurement model first. Except for four single-item constructs (WC, GD, AP, SST) which did not have to go through this analytical stage, the statistical results showed that the other indicators superseded .40, an acceptance threshold for exploratory research (Hulland, 1999, as cited in Hair et al., 2017). Concerning the construct validity and convergent validity, EM received .539, .554, and .421 for Cronbach's Alpha, Composite reliability (rho_a), and Average Variance Extracted (AVE), respectively, which were below the acceptance threshold (Hair et al., 2017); therefore, EM was excluded.

The new measurement comprised 36 indicator variables or 12 constructs. Then, the authors computed the model again and found that the indexes of outer loadings, indicator reliability convergent validity, and discriminant validity met the thresholds suggested by Hair et al. (2017). Regarding the collinearity, Hair et al. (2017) claimed that the tolerance value (VIF) should be in the range of .20 to 5. Under this reference, all the VIFs met the threshold, and there was no or very little possibility of collinearity among the constructs.

Next, the authors grouped ATC, IWT, IWP, and UT to establish EF, IM, and SE to make BL and SR and SF to form BF. The newly formed model (Figure 3) included 04 constructs or nine indicator variables as in Table 1 below.

Table 1

Outer Loadings of the Measurement Model (HOCs)

	BF	**BL**	**EF**	**WC**
SF	0.965			
SR	0.801			
SE		0.727		
IM		0.960		
SE		0.727		
UT			0.760	
ATC			0.522	
IWP			0.937	
WC				1
Significant level		≥ .40 (Hulland, 1999, as cited in Hair et al., 2017)		

Source. Data analysis result of the research

Table 1 shows that the indicator reliability of the overall scale was met when all the outer loading indexes exceeded the threshold of 0.4 (Hulland, 1999, as cited in Hair et al., 2017). The outer loading means that the higher the index is, the larger that indicator contributes to its latent construct. For instance, BF contains SF with its outer loading of .965 and SR with .801, meaning that SF makes a larger contribution than SR.

The next step was assessing the internal consistency reliability and convergent validity. Hair et al. (2017) proposed that researchers should not assess the internal consistency reliability of the formative constructs. This indicates that EF, BL, and BF were not involved in this analytical step. However, it should be noted that BL and BF are HOCs, whose indicators were assessed earlier and met the acceptable thresholds of internal consistency reliability and convergent validity before being grouped.

Finally, the authors assessed the collinearity of the indicators. While WC, a single indicator variable, was excluded from this analytical stage, the other constructs were examined. Statistically, EF, BL, and BF received their index in the acceptable range of .20 to 5. Particularly, the lowest index belonged to ACT (1.236); in contrast, IWT bore the highest index (3.011). Though different, all the indexes indicate that there was no or very little possibility of collinearity among the indicators of the outer model.

In summary, the authors examined the measurement model and found that all the indicators show good loading indexes. However, the calculation in this step excluded EM because it failed to meet the acceptable threshold of consistency reliability, convergent validity, and discriminant validity. After EF, BL, and BF were formed as HOCs, the new model consisted of nine indicators. The statistical results reveal that the indexes of all the nine indicator variables met the requirements of calculation, and they could go further into the structural model assessment.

5.1.2. Structural model assessment and hypothesis testing

Assessing the structural model requires the authors to look at the model fit index, coefficients of determination, sizes, and significance of path coefficients and effect sizes. In this procedure, the first assessment focused on the model fit index. According to Hair et al. (2017), the model reaches a good fit from .02 to .80. The statistics show that the SRMR index of the estimated model is .046; meaning that the newly validated model is good for calculating the effects of the exogenous constructs on their corresponding endogenous ones.

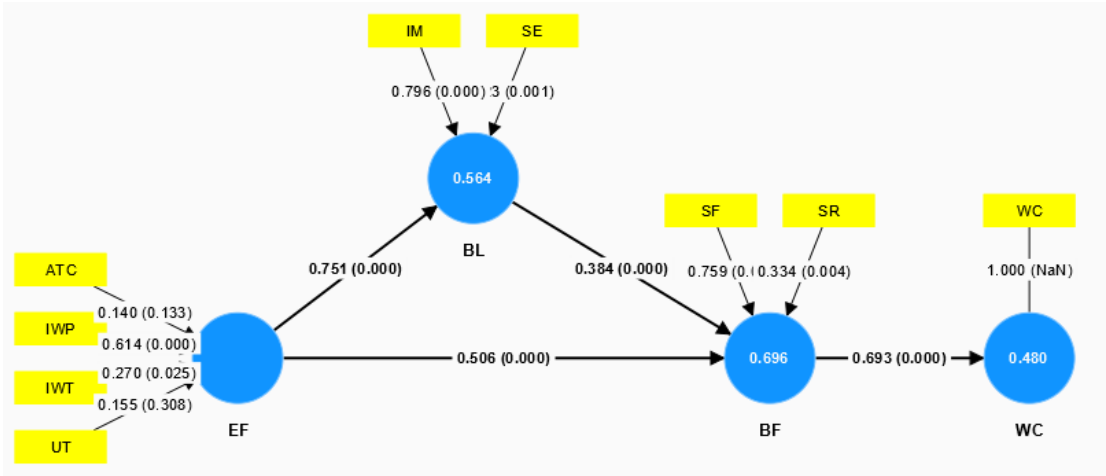
The next step is assessing the coefficients of determination (R^2). Hair et al. (2017) postulated that the R^2 values of .75, .50, and .25 for the exogenous constructs are described respectively as substantial, moderate, and weak. Figure 3 shows that EF could explain 56.4% of the variance of BL. Then, EF and BL together could explain 69.6% of the variance of BF. Finally, BF could explain 48% of the variance of WC. The statistical results indicate that EF and BL together could quite substantially explain the variance of BF, while BL and WC could be moderately explained by their immediate exogenous constructs in the model.

Then, the authors assessed the size of path coefficients. Hair et al. (2017) proposed that the value ranges from -1 to +1, and the higher the value is, the larger the impact is. The arrow-headed lines among the HOCs in Figure 3 indicate that EF generates the largest influence on BL (.751). Second is the effect of BF on WC (.693), and BF receives the impacts of EF (.506) more than BL (.384).

To check the significance of the path coefficients, the authors performed the bootstrapping technique to increase the sample to 5000. Statistically, Figure 3 shows the relationship in each pair of constructs was supported by statistically significant P-values (lower than .05). Thanks to this, the authors could determine the effects of the exogenous constructs on their corresponding endogenous ones. The systems information exhibits that if one expects the endogenous construct (i.e., WC) to increase, its exogenous construct (i.e., BF) with a significant index should be changed first.

Figure 3

Structural Model (HOCs)



Source. Data analysis result of the research

The final step is to assess the effect size (f^2) to quantify the level of influences shown in the statistically significant relations. Theoretically, Hair et al. (2017) proposed three levels of .02, .15, and .35 as small, medium, and large effects. As EF worked as an exogenous construct

only, it needed to be split up to locate the effect size of each LOCs. The statistical calculation shows that all effect sizes were positive. Particularly, with $f^2 < .02$, ACT generated a little effect on BL (.001), and the same were the influences of IWT on BF (.013) and the impact of UT on BF (.001). With f^2 being close to .02, there was a medium effect of ACT on BF (.091), IWP on BF (.137), IWT on BL (0.053), and UT on BL (.023). With f^2 being close to .15, BL generated a medium effect on BF (.224), and similar was the effect of IWP on BL (.230). It is worth noting that BF caused the greatest effect on WC (.925).

The authors added STT and AP to the newly validated model to test the hypotheses. Table 2 shows that Hypotheses H1-H6 were accepted when they met the statistically significant P-values (below .05). Directly, EF affected BL most (75.1%), then BF impacted WC (69.3%), and finally, BL influenced BF least (38.4%). Indirectly, EF affected WC the most (55.1%), then EF influenced BF (28.9%), and finally, BL impacted WP the least (26.6%). The significant relations mean the positive effects of an endogenous construct on its corresponding endogenous ones.

Table 2

Hypothesis Testing

Relations		Path coefficients	Sample mean	Standard deviation	P values	Hypotheses	Results
BF -> WC	Direct	0.693	0.691	0.073	0.000	**H6**	**Accepted**
BL -> BF		0.384	0.371	0.100	0.000	**H4**	**Accepted**
EF -> BL		0.751	0.745	0.085	0.000	**H1**	**Accepted**
BL -> WC	Indirect	0.266	0.256	0.073	0.000	**H5**	**Accepted**
EF -> BL		0.289	0.275	0.077	0.000	**H2**	**Accepted**
EF -> WC		0.551	0.551	0.094	0.000	**H3**	**Accepted**
SST*BF -> WC	Moderating	0.195	0.173	0.110	0.077	H9	Rejected
AP*BF -> WC		0.169	0.170	0.087	0.053	H8	Rejected

Source. Data analysis result of the research

Concerning the moderating effects, SST and AP are direct quantitative single-variable constructs; thus, the calculation was performed immediately. Nonetheless, the results show that although the P-values of H8 and H9 were above the acceptable level of .05, Hypotheses 8 and 9 were rejected, indicating that the effects of SST and AP on the relation between BF and WC were not validated.

The final hypothesis is about GD and WC, and the authors performed the bootstrap multigroup analysis. The result shows that the male-female difference of path coefficients was positive (.271), and the P-value was .018. These indexes indicate that the effect of GD on the relation of BF and WC was statistically significant, meaning that male students studied better in CW and gained higher WC than females.

In summary, the authors found the indirect influences of EF on BF, EF on WP, and BL on WP, which were under-researched in the literature. This contributes to understanding the effects of the CW environment on EFL students' learning behavior and WC, and the effects of students' beliefs on their results. Another contribution is that this study focused on Bandura's SCLT (1989) and successfully pointed out that BF is the most influential on students' learning results, and it is affected directly by BL and indirectly by EF at varying degrees. The final contribution resides in the moderating effect of GD on students' WC, meaning that males were more subject to the effects of BF on WC than females.

5.2. Discussion

The analytical result has shown eight statistically significant relations among the constructs. Relying on the findings above, the authors present some discussions and implications below.

Firstly, BF generates the most influential direct impact on WC; thus, if wishing to increase students' learning results, one must increase their students' learning activities first. Figure 3 shows that BF can explain 48% of the variance of WC, and Table 2 indicates that the path coefficient between BF and WC is .693, meaning that the increase of BF can entail that of WC by 69.3%. Also, in Table 1, SF and SR bear the path coefficients of .759 and .334, respectively, meaning that SF is more important than SR in their contributions to BF. This finding is somewhat different from Nguyen and Le's (2018) and Chu and Nguyen's (2022), who found SF directly affects students' success in learning English. In the case of CW, this finding implies that the teacher should deliver his lesson in a way that students will have time and freedom to think about what they are learning and how they can study better. Then, their SF can direct their learning activities to gain what they have set earlier.

Secondly, BL indirectly influences WC through BF. In earlier research, Callum (2011) found the direct effect of IM on students' behavior, Chu and Nguyen (2022) claimed that IM and SE are the direct predictors of students' learning results. This study, however, has proven a valid indirect relation between BL and WP. Table 2 indicates that the path coefficient between BL and WC is .266, meaning that the increase of BL will most likely cause a positive change of WC by 26.6%. Figure 3 also shows that IM and SE, which form BL, bear the regression weights of .796 and .323 respectively, meaning that IM makes larger contributions to BL than SE. This finding implies that students pay more attention to self-determination, competence, task involvement, curiosity, enjoyment, and interest than the belief in the capabilities to organize and execute courses of action required to produce given attainments. Therefore, besides helping students realize that they can complete the course well during the teaching and learning process, the teacher of English writing should create a class, which interests his students first. Due to the indirect effect of BL on WC, when BL in CW is increased, it will directly affect BF, which results in students' increased WC later.

Thirdly, EF indirectly impacts WC through BL and BF. Table 2 shows that the path coefficient of EF and WC is .551, indicating that the increase of EF will likely lead to a positive change of WC by 55.1%. Compared to the indirect effect of BL on WP (.241), the indirect effect of EF on WP is much larger, meaning that EF is more important than BL in affecting WC. This finding partly coincides with some earlier research in which EF, though represented by different definitions, was found to affect students' learning scores directly (Chu, 2023; Duwal & Khonju 2020; Nguyen & Le, 2018) or their learning performance indirectly (Qureshi et al., 2021); however, the effect of EF on WC on this study is indirect.

The finding about the effect of EF on WC implies that a good learning environment will likely benefit students. As EF affects WC via BL and BF, the influence of EF on WC requires the presence of BL and BF, indicating that students' beliefs and behavior positively contribute to this effect. In Table 2, EF affects BL directly by 75.1 % and BF indirectly by 28.9%. It can be inferred that EF is improved, students' beliefs and behavior are improved, and then their CW is improved too. Thus, a teacher should build up a learning environment in which students can have a positive attitude towards the learning course, practice interaction with the teacher and peers, and make good use of technology, through which students' WC will be increased.

Fourth, GD impacts the relation between BF and WC in the way that males benefit more from CW than females. This finding is a new contribution in the domain of CW because GD was

not found to generate a significant moderating influence on students' learning results (Chu & Nguyen, 2020; Duwal & Khonju 2020). The implication is that because the moderating effect of GD on the relation of BF and WC means that the more male students a CW class has, the higher WC is, the teacher of English writing should pay more attention to and care for female students in order that they can act and interact more. When students' behavior is increased, their learning results will increase too.

In conclusion, the research has contributed greatly to finding the CW factors that affect EFL students' WC. Table 2 and Figure 3 show that WC can be increased by the positive change of its independent constructs. If stakeholders wish to enhance EFL students' WC, they should change its exogenous constructs first.

6. Conclusion

The findings of this study have successfully dealt with the research questions stated earlier and have pointed out how EFL students' WC is affected in a CW environment. Besides, the newly validated model has exhibited how an exogenous construct directly and/or indirectly impacts its endogenous constructs. Nonetheless, because this is exploratory research, applying its findings requires further empirical evidence in confirmatory research done on a larger scale (Creswell & Crewell, 2018). Additionally, subsequent researchers or practitioners should consider this study's context before applying the findings to address the new issue in the new context.

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