Electronic Journal of Foreign Language Teaching

Journal DOI: 10.56040/e-flt
Issue DOI: 10.56040/e-flt.182
Article DOI: 10.56040/wpmd1822

ISSN 0219 9874
Vo. 18 No. 2, pp. 140–155

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Modeling the determinants of English writing performance: Directions to interdisciplinary writing instruction

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Abstract

This cross-sectional study examines the impact of five learner-factor groups – intellectual, learning, social, environmental, and mental domains, on writing performance using confirmatory factor analysis and multiple-group structural equation modeling, and qualitative analysis of response scripts. Triangulated data was collected from the persuasive-writing task scores and the Likert-scale and interview-based questionnaire responses of 499 first-year Thai undergraduates from 11 faculties at a university in central Thailand. The results showed the global fits between the hypothesized model and the empirical data (Chi-Square = 330, df = 169, p-value < .001, CFI = 0.96, TLI = 0.95, RMSEA = 0.04). The intellectual appeared to be the most powerful factor affecting participant writing performance. The learning factors which impacted the writing performance of the Science and Technology group (β = -.24, t = -2.60) with the highest degree of significance was out-of-class activity (β = .81, t = 42.12, $p \leq .05$). Intellectual factors were shown to affect female student writing performance (β = .62, t = 9.42) more so than males (β = .44, t = 6.14, $p \leq .05$). Participants viewed instrumental motivation as affecting their writing performance (mean = 2.98, SD = .93, p = .04). Qualitative data from gender non-conforming participants' responses also uncovered underlying factors: remote student-teacher relationships and unwillingness to communicate, impairing their English learning and writing performance. Insights gleaned from the responses of gender non-conforming participants have led to suggestions for further research regarding writing instruction.

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Peungpipattrakul, W. (2021). Modeling the determinants of English writing performance: Directions to interdisciplinary writing instruction. *Electronic Journal of Foreign Language Teaching [e-FLT], 18*(2), 140–155. https://doi.org/10.56040/wpmd1822

1 Introduction

Out of the 17 United Nations Sustainable Development Goals (SDGs), the agenda for quality education is to ensure "inclusive and equitable quality education and promote lifelong learning opportunities for all" (https://sdgs.un.org/goals). The quality of educational outcomes, in terms of educational achievement, literacy skills, and English proficiency, is typically measured through tests and examinations (e.g. https://www.oecd.org/pisa/). Global literacy and proficiency in English, as defined by Thailand's 2002 Educational Reform Act, are the ability to comprehend and produce written English. Writing is considered the most difficult skill (https://ted-ielts.com/is-ielts-fair/). To illustrate, IELTS test takers obtained their lowest average score on the writing section (7.0) while having the scores on the listening, reading, and speaking sections of 9.0, 9.0, and 8.0 respectively

out of 9.0 (Wills, 2018). Thai learners' unsatisfactory English-language proficiency suggests there are problems relating to Thai learners' literacy at basic and higher education levels (The Nation, 2019). According to the EF English proficiency index, Thai students' English proficiency was ranked as being 'low proficiency', in 2017, which was 15th of 20 countries in Asia and 53rd out of 80 countries globally (https://www.ef.co.uk/epi/regions/asia/ thailand/). Thai adult learners' disappointing English-language proficiency was observed in 2019 in academic (e.g. TOEFL-iBT average scores) and professional settings (e.g. TOEIC scores). In 2019, Thai learners' TOEFL-iBT average score was 80, while learners from other Asian countries like Korea and Malaysia obtained 84 and 91 respectively out of 120 (ETS, 2019: 22). Similarly, Thai test takers' TOEIC average writing score was 140 out of 200, while that of Taiwanese and of Filipinos test takers were 155, and 170, respectively (ETS, 2020: 31).

The 2016 national education reform was implemented via outcome-based education to improve the quality of education. The focal point of outcome-oriented learning requirements is primarily English language syllabi and practice in tertiary education (Nitungkorn, 2001; Wiriyachitra, 2002). Despite receiving outcome-based education, most university undergraduate students in Thailand struggle with English language writing (Sripicharn, 2002). A challenge for Thai teachers of English is to find effective teaching and learning practices to assist students in mastering the skills of English and developing English literacy and proficiency (Jones and Saville, 2016: 79). In this study, the theoretical underpinning of the research framework employed is the attributes of good language learners (GLLs), which are associated with successful language learning and variables of learners (e.g. motivation and gender) and of learning (e.g. teaching practices in learning writing skills) (Griffiths, 2008).

2 Individual variations in learners and language learning

The principle of individual differences assumes everyone is unique. Second language acquisition (SLA) explains the diversity of learners and learning based on three inter-connected frameworks: psychological, linguistic, and social (Saville-Troike, 2007, p. 24). Learner differences are categorized by psychological dimensions, which include affective factors (e.g. attitudes, motivation, and anxiety), biological differences (e.g. age and gender), and teaching-learning processes (e.g. teaching strategies, learning involvement and activities). As for linguistic and social dimensions, "learning comes through writing" (Murray, 2017, p. 17); both are inter-related. Additionally, writing is a process through which meanings are socially exchanged (Vygotsky, 1978).

The complex issue of individual student variations has been perceived in the field of English language learning and instruction as a learning variable that results in either positive or negative outcomes and skill achievement. Studies have revealed the characteristics of GLLs can be influenced by learner factors (Richards and Renandya, 2002; Renandya, 2020). Gender (Nyikos, 2008), learning strategies (Yulianti, 2018), beliefs (White, 2008), motivation (Dörnyei, 2002; Chong, Renandya and Rong, 2019), and autonomy (Cotterall, 2008) are all regarded as learner factors or individual variations relating to successful language learning. In addition, Griffiths (2008) also points out certain learning variables are considered factors related to leaners' successful learning of a language. Those variables are language skills (Gordon, 2008; Schramm, 2008), tasks (Rubin and McCoy, 2008), and teaching/learning methods (Griffiths, 2008). Learner factors have been widely discussed regarding to how they affect language learning and achievement for more than four decades (1972 to 2020) (Brown, 2007; Dörnyei, 2002; Griffiths, 2019; Lukmani, 1972; Renandya, 2020).

Numerous studies of learner variations have shown that learners' internal and external factors were found to be correlated with motivation and language learning achievement. Internal factors included psychological factors such as learners' desire to study a target language, attitudes toward language learning, linguistic confidence, and awareness of their ability to develop language skills. External factors included teachers, classmates, and the classroom environment. To obtain helpful insights into which learner factors affect favorable and unfavorable learning outcomes or writing

performance, subtle variables related to students' learning and performance should be investigated (henceforth referred to as latent variables).

Hence, this study aims to investigate how the underlying learner factors of first-year Thai university undergraduates affect and may predict their writing performance by utilizing the method of factor analysis.

3 Research framework

The research framework of the study is provided through the parameters of the hypothesized model (in Figure 1) and their interpretations (in Table 1).

Figure 1
Multiple-group structural equation modelling (SEM) of individual learner factors' impact on writing performance

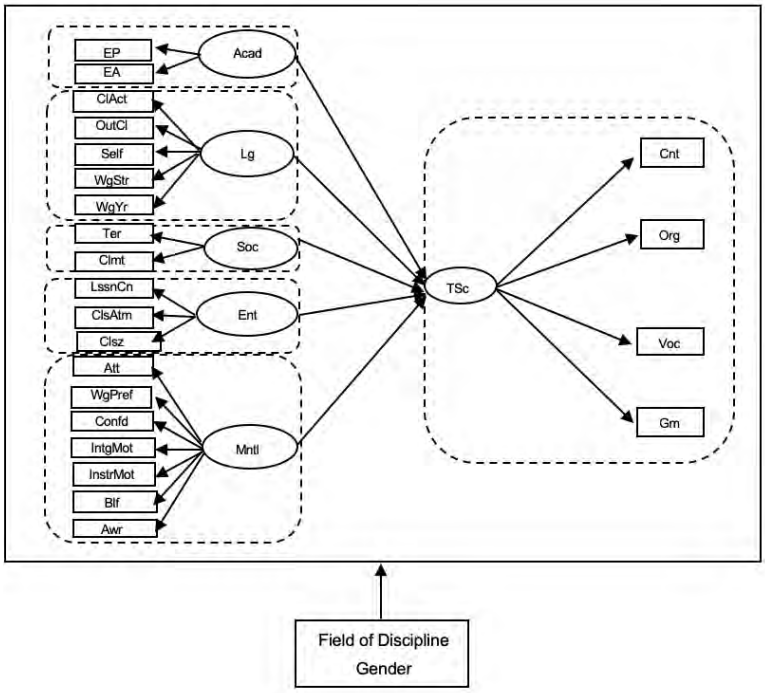


Table 1
Latent variable codes of learners and their interpretation

Latent variable	Indicator or Observed variable
1. Acad (Intellectual factors)	EP (score of English proficiency) and EA (English achievement grade)
2. Lg (Learning factors)	ClAct (in-class activity), OtCl (out-of-class activity), Sf (self-study), WgStr (writing strategy), and WgYr (length of writing experience)
3. Soc (Social factors)	Ter (instructor) and Clmt (classmates)
4. Ent (Environmental factors)	LsnCn (writing lesson content), ClAm (classroom atmosphere) and Clsz (class size)
5. Mntl (Mental factors)	Att (attitudes toward English language learning), WgPrf (writing-skill preference), Cnfd (writing confidence), IntgMot (integrative motivation), InstrMot (instrumental motivation), Blf (self-belief in own potential), and Awr (awareness of writing skills)
6. TSc (Total writing scores)	Cnt (content score), Org (organization score), Voc (vocabulary score), and Gm (grammar score)

Figure 1 and Table 1 show the proposed Structural equation modeling (SEM) of the impact of five groups of learner variations (pertaining to intellectual, learning, social, environmental, and mental factors) on writing performance. In this Figure, confirmatory factor analysis (CFA) was used to test six measurement models indicated by the dashed lines. The six latent variables of learner factors, as seen in Table 1, are measured with their observed variables or indicators.

4 Research questions and hypotheses

Research questions and hypotheses are generated to serve the four research purposes of the study:

1. Do observed variables relate to latent variables? If so, what are the relationships between observed and latent variables?
   - H_0: There is no fit between the hypothesized model and the empirical data.
   - H_1: There is a fit between the hypothesized model and the empirical data.
2. Do intellectual, learning, social, environmental, and mental factors predict participant writing performance?
   - H_0: The participants' intellectual, learning, social, environmental, and mental factors do not predict their writing performance.
   - H_1: The participants' intellectual factors (i.e. scores of English proficiency and English achievement grade) predict their writing performance.
   - H_2: The participants' learning factors (i.e. in-class activity experience, out-of-class activities, self-study, writing strategies, and length of writing experience) predict their writing performance.
   - H_3: The participants' social factors (i.e. instructor and classmates) predict their writing performance.
   - H_4: The participants' environmental factors (i.e. writing lesson content, classroom atmosphere, and class size) predict their writing performance.
   - H_5: The participants' mental factors (i.e. attitudes toward English language learning, writing-skill preference, instrumental motivation, integrative motivation, self-belief on own potential, and awareness of writing skills) predict their writing performance.
   - H_6: The participants' writing scores (i.e. content, organization, vocabulary, and grammar scores) predict their writing performance.
3. What are the most dominant factors determining participant English-writing performance?
4. What are the participants' perceptions regarding the associated factors affecting English writing performance?

5 Methods

5.1 Context and participants

This study was conducted at a university located in central Bangkok, Thailand in the second semester of the 2019 academic year (January to May 2020). The target population in this study is 4,781 first-year Thai undergraduate students, enrolling in Foundation English II, from 19 faculties enrolled in Foundation English II. Out of 4,781 students, 789 participants were selected using a multistage random sampling method through the G*Power program (Pickard, 2008: 63). All 789 students were informed of their selection and that their participation was voluntary, anonymous, and confidential. All those selected, completed, and returned consent forms issued by the University Office of the Research Ethics Review Committee for Research Involving Human Subjects in Social

Sciences, Humanities, and Fine and Applied Arts, to express their willingness to take part in this study. Table 1 shows their details in relation to field of discipline and gender.

Table 1
Total number of participants by field of discipline and gender

Field and discipline	Male *n* (%)	Female *n* (%)	Others *n* (%)	Total *n* (%)
Science & Technology	105 (21.04)	124 (24.85)	0 (0.00)	229 (45.89)
Medicine	1 (0.20)	28 (5.61)	0 (0.00)	29 (5.81)
Science	43 (8.62)	52 (10.42)	0 (0.00)	95 (19.04)
Engineering	13 (2.61)	13 (2.61)	0 (0.00)	26 (5.21)
Architecture	3 (0.60)	10 (2.00)	0 (0.00)	13 (2.61)
Allied Health Science	23 (4.61)	21 (4.21)	0 (0.00)	44 (8.82)
Agricultural Resources	22 (4.41)	0 (0.00)	0 (0.00)	22 (4.41)
Social Sciences and Humanities	31 (6.21)	88 (17.64)	10 (2.00)	129 (25.85)
Education	28 (5.61)	47 (9.42)	0 (0.00)	75 (15.3)
Political Science	0 (0.00)	21 (4.21)	8 (1.60)	29 (5.81)
Communication Arts	3 (0.60)	20 (4.01)	2 (0.40)	25 (5.01)
Business	32 (6.41)	106 (21.24)	3 (0.60)	141 (28.26)
Commerce and Accountancy	25 (5.01)	90 (18.04)	2 (0.04)	117 (23.45)
Economics	7 (1.40)	16 (3.21)	1 (0.20)	24 (4.81)
Total	168 (33.67)	318 (63.73)	13 (2.61)	499 (100.00)

5.2 Data collection

The quantitative and qualitative data for analysis were collected from 789 participants' scores on two of the 250-word persuasive writing tasks required in the Foundation English II course and responses to closed-ended, Likert-scale, and open-ended questions in the form of a questionnaire. Three parts of the 36-item questionnaire were designed to elicit the participants' demographics and English language learning background (eight closed-ended, one open-ended, and six Likert scale items) and perceptions of learner factors affecting writing performance (21 Likert scale items and one open-ended item). The collection of the participants' writing scores was completed before the outbreak of COVID-19, and only some of the questionnaire responses from some class sections were collected at the very beginning of the outbreak. It is noted that owing to the abrupt shift of instruction from face-to-face to online during the questionnaire collection period from March to May 2020, some number of completed hard-copy questionnaires were returned electronically. The change in the method of data collection affected the response rate, which was 63.24% (499 of 789 participants).

5.3 Data analysis

MPlus software (version 7) was used to perform CFA in answer to Research Question 1. SEM and multiple-group SEM analyses were used to answer Research Questions 2 and 3, while the Statistical Package for the Social Sciences (SPSS) version 22.0 to Research Question 4.

5.4 Main findings

5.4.1 The hypothesized model: A relationship between observed and latent variables

To answer Research Question 1, the structural validity of the measurement model of a set of observed and latent variables was assessed through CFA in the MPlus program (https://www.statmodel.com/verhistory.shtml) (see Figure 1). The findings suggest a significant relationship between

a set of observed and latent variables. Moreover, based on Kline's (2016) fit indices, there are global fits between the hypothesized model and the empirical data through CFA on six measurement models: intellectual-factor model (CFI = 1.00, TLI = 1.00, RMSEA = 0.00), learning-factor model (CFI = 1.00, TLI = 1.00, RMSEA = 0.01), social-factor model (CFI = 1.00, TLI = 1.00, RMSEA = 0.00), environment-factor model (CFI = 1.00, TLI = 1.00, RMSEA = 0.00), mental-factor model (CFI = 1.00, TLI = 1.00, RMSEA = 0.02), and total-writing-score model (CFI = 1.00, TLI = 0.98, RMSEA = 0.06).

5.4.2 The extent of individual learner variables: Predictors of writing performance and the most dominant factors influencing writing performance

The background information for the analyses of the predictors of and the most dominant factors in writing performance includes a correlation matrix of 23 observed variables and a SEM analysis based on data from the 499 study participants. Based on the proposed model, the hypotheses regarding the impact of the five learner factors on writing performance were tested using SEM and are shown in Table 2.

Table 2
Analysis of impact of individual learner factors on writing performance by Structural Equation Modeling (n = 499)

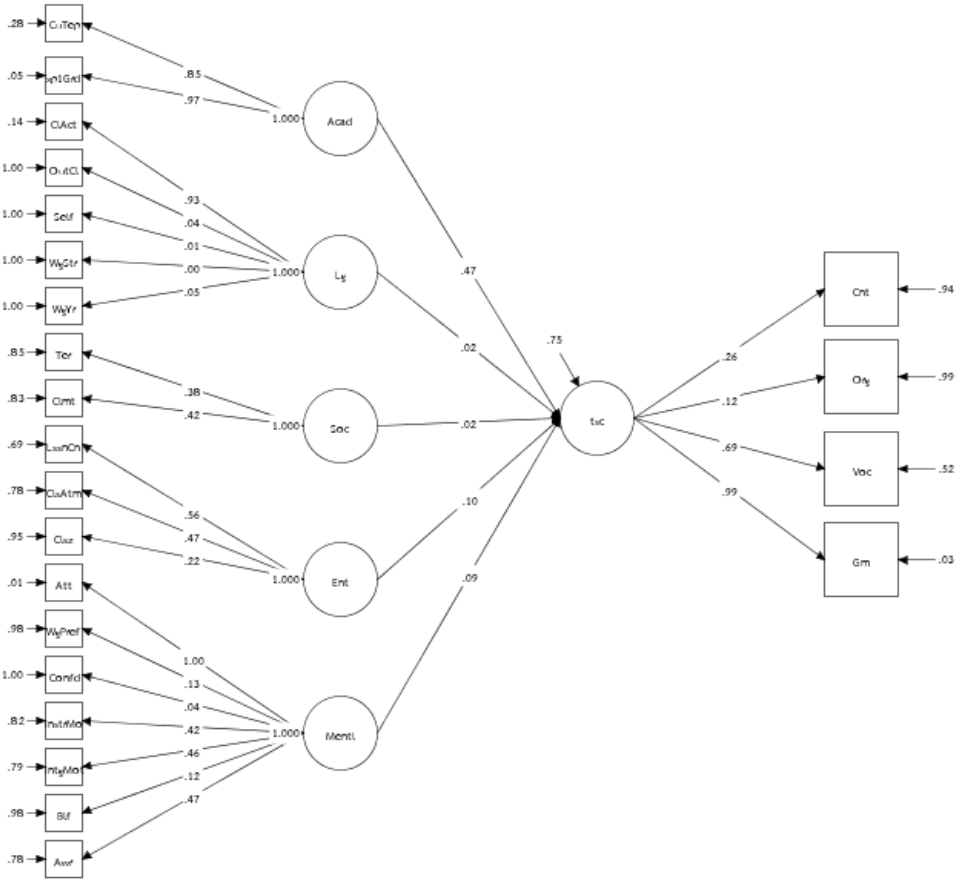
Variable	Parameter Unstandardized Score		Parameter Standardized Score		R^2
	b (SE)	t	β (SE)	t	
Measurement Model					
Acad					
EP	1.00	-	0.85 (0.02)	52.89*	0.72
EA	0.99 (0.04)	23.88*	0.97 (0.02)	42.17*	0.95
Lg					
ClAct	1.00	-	0.93 (0.03)	31.60*	0.86
OtCl	0.05 (0.06)	0.85	0.04 (0.05)	0.85	0.002
Sf	0.01 (0.04)	0.20	0.01 (0.05)	0.20	< 0.001
WgStr	0.001 (0.06)	0.02	0.001 (0.05)	0.02	< 0.001
WgYr	0.08	-	0.05 (0.002)	31.58*	0.003
Soc					
Ter	1.00	-	0.38 (0.05)	7.16*	0.15
Clmt	1.14 (0.11)	10.78*	0.42 (0.06)	7.47*	0.17
Ent					
LsnCn	1.00	-	0.56 (0.04)	12.59*	0.31
ClAm	0.86 (0.08)	10.62*	0.47 (0.04)	11.44*	0.22
Clsz	0.40 (0.07)	5.37*	0.22 (0.04)	5.34*	0.05
Mntl					
Att	1.00	-	1.00 (0.00)	5319.92*	0.99
WgPrf	0.31 (0.12)	2.57*	0.13 (0.05)	2.53*	0.02
Cnfd	0.10 (0.12)	0.78	0.04 (0.05)	0.77	0.002
InstrMot	0.91 (0.07)	12.31*	0.43 (0.03)	13.90*	0.18
IntgMot	0.82 (0.06)	13.52*	0.46 (0.03)	15.68*	0.21
Blf	0.27 (0.11)	2.49*	0.13 (0.05)	2.45*	0.02
Awr	0.89 (0.10)	9.25*	0.47 (0.05)	10.08*	0.22
Tsc					
Cnt	1.00	-	0.26 (0.04)	6.35*	0.07
Org	0.45 (0.24)	1.89	0.12 (0.07)	1.79	0.01
Voc	2.71 (0.46)	5.85*	0.69 (0.02)	29.51*	0.48
Gm	4.73 (0.78)	6.09*	0.99 (0.001)	1142.56*	0.97

Structural Model				
Acad → Tsc	0.06 (0.01)	5.43*	0.47 (0.04)	12.70*
Lg → Tsc	0.01 (0.02)	0.35	0.02 (0.05)	0.35
Soc → Tsc	0.01 (0.03)	0.38	0.02 (0.05)	0.38
Ent → Tsc	-0.04 (0.03)	-1.37	-0.10 (0.07)	-1.43
Mntl → Tsc	-0.04 (0.05)	-0.79	-0.09 (0.11)	-0.79
$\chi^2(169) = 330.00$, $p < .001$		$\chi^2/df = 1.95$	$R^2 = 0.254$	
CFI = 0.96	TLI = 0.95	RMSEA = 0.04	SRMR = 0.08	

*Statistically significant ($p < .05$).

The results in Table 2 are illustrated in Figure 2.

Figure 2
Multiple-group SEM of individual learner factors affecting writing performance.



The results, in Table 2, demonstrate the proposed SEM obtained a global fit with the experimental data (Chi-Square = 330, df = 169, p-value < .001, CFI = 0.96, TLI = 0.95, RMSEA = 0.04). Based on the proposed model, the research hypotheses appear confirmed - there are significant effects associated with 18 out of 23 indicators of writing performance. Overall, the analysis of a causal relationship between the five independent learner factors and writing performance indicated that only the intellectual indicators could predict the participants' writing scores, despite not being greater than 50% of degree of predictability of writing performance ($R^2 = .254$). Research Question

2 addresses the degree of accurate prediction of intellectual factors of writing performance which was only 25.4%. To answer what the most dominant factors influencing English-language writing performance are, it was found that the intellectual domain was the most powerful factor (β = .47, t = 12.70) at the .05 significance level (Research Question 3). Participants who had high levels of intellectual factors in terms of English proficiency and previous English achievement during Foundation English I should be able to subsequently obtain high writing scores in the aspects of content, organization, vocabulary, and grammar in Foundation English II (Table 2 and Figure 2). Noticeably, previous English achievement grades (β = .97, t = 42.17, R^2 = .95) had a higher impact on writing performance than English proficiency (β = .85, t = 52.89, R^2 = .72).

5.4.3 Multiple-group analysis of the learner-factor impact on writing performance

A summary of the multiple-group SEM analyses showing differences among the effects of five learner factors on writing performance in relation to fields of disciplines and gender is below.

5.4.3.1 Fields of disciplines

There were global fits of the SEM models on individual fields of disciplines: Science and Technology (Chi-Square = 248.85, df = 171, p-value < .001, CFI = 0.96, TLI = 0.95, RMSEA = 0.04), Social Sciences and Humanities (Chi-Square = 210.33, df = 190, p-value = .15, CFI = 0.99, TLI = 0.98, RMSEA = 0.10), and Business (Chi-Square = 220.63, df = 198, p-value = .13, CFI = 0.98, TLI = 0.98, RMSEA = 0.03). Table 3 shows the results of the SEM analyses of each field.

Table 3
SEM multi-group analyses: Three fields of disciplines

Variable	Parameter Unstandardized Score		Parameter Standardized Score	
	b (SE)	t	β (SE)	t
Structural Model: Science and Technology (n = 229)				
Acad → Tsc	-0.01 (0.01)	-1.19	-0.14 (0.08)	-1.67
Lg → Tsc	-0.33 (0.24)	-1.36	-0.24 (0.09)	-2.60*
Soc → Tsc	-0.11 (0.13)	-0.84	-0.24 (0.24)	-1.02
Ent → Tsc	0.10 (0.13)	0.76	0.32 (0.37)	0.87
Mentl → Tsc	0.02 (0.08)	0.31	0.08 (0.25)	0.32
$\chi^2(171) = 248.85$, $p < .001$	$\chi^2/df = 1.46$		$R^2 = 0.101$	
CFI = 0.96	TLI = 0.95	RMSEA = 0.04	SRMR = 0.10	
Structural Model: Social Sciences and Humanities (n = 129)				
Acad → Tsc	0.22 (0.18)	1.19	0.57 (0.47)	1.20
Lg → Tsc	-0.19 (4.29)	-0.04	-0.03 (0.63)	-0.04
Soc → Tsc	-0.04 (0.74)	-0.05	-0.02 (0.34)	-0.05
Ent → Tsc	0.35 (0.60)	0.58	0.28 (0.48)	0.59
Mentl → Tsc	-0.44 (1.52)	-0.29	-0.29 (0.99)	-0.29
$\chi^2(190) = 210.33$, $p = .15$				
CFI = 0.99	TLI = 0.98	RMSEA = 0.03	SRMR = 0.10	
Structural Model: Business (n = 141)				
Acad → Tsc	0.04 (0.05)	0.88	0.14 (0.16)	0.89
Lg → Tsc	0.49 (0.48)	1.01	0.13 (0.13)	1.02
Soc → Tsc	0.36 (0.42)	0.86	0.24 (0.28)	0.87
Ent → Tsc	-0.14 (0.14)	-0.98	-0.17 (0.16)	-1.07
Mentl → Tsc	-0.26 (0.30)	-0.86	0.28 (0.32)	-0.87
$\chi^2(198) = 220.63$, $p = .13$				
CFI = 0.98	TLI = 0.98	RMSEA = 0.03	SRMR = 0.07	

*Statistically significant ($p < .05$).

From Table 3, the only statistically significant effect on writing performance was found in the learning factor of the Science and Technology group (n = 229; β = -.24, t = -2.60) at the .05 significance level. However, there was no significant effect in either Social Sciences and Humanities (n = 129) or Business (n = 141) group. To elaborate on the learning factor, it was found four out of five indicators were statistically significant in affecting writing performance. The degree of significant impact appeared highest in out-of-class activity (β = .81, t = 42.12), writing strategy (β = -.44, t = -6.37), length of writing experience (β = .28, t = 3.68), and in-class activity (β = .20, t = 22.06) at the .05 significance level.

5.4.3.2 Gender

SEM model fits were found for both male (Chi-Square = 216.93, df = 191, p-value = .10, CFI = 0.98, TLI = 0.98, RMSEA = 0.03) and female (Chi-Square = 266.35, df = 170, p-value < .01, CFI = 0.97, TLI = 0.95, RMSEA = 0.04) participants. A significant difference in the effect of learner factors on writing performance was found between males (n = 181) and females (n = 318) as indicated in Table 4.

Table 4
SEM multi-group analyses: Gender

Variable	Parameter Unstandardized Score		Parameter Standardized Score	
	b (SE)	t	β (SE)	t
Structural Model: Male (n = 181)				
Acad → Tsc	0.05 (0.02)	2.43*	0.44 (0.07)	6.14*
Lg → Tsc	-0.06 (0.13)	-0.47	-0.04 (0.08)	-0.48
Soc → Tsc	-0.04 (0.05)	-0.77	-0.09 (0.11)	-0.78
Ent → Tsc	-0.05 (0.05)	-0.91	-0.13 (0.14)	-0.95
Mentl → Tsc	0.07 (0.10)	0.67	0.18 (0.26)	0.69
$\chi^2(191) = 216.93$, $p = .10$				
CFI = 0.98	TLI = 0.98	RMSEA = 0.03	SRMR = 0.07	
Structural Model: Female (n = 318)				
Acad → Tsc	0.08 (0.02)	5.05*	0.62 (0.07)	9.42*
Lg → Tsc	0.56 (0.19)	2.93*	0.28 (0.09)	3.36*
Soc → Tsc	0.21 (0.12)	1.79	0.24 (0.15)	1.60
Ent → Tsc	-0.18 (0.08)	-2.29*	-0.33 (0.13)	-2.59*
Mentl → Tsc	-0.15 (0.06)	-2.58*	-0.31 (0.11)	-2.77*
$\chi^2(170) = 266.35$, $p < .001$	$\chi^2/df = 1.57$			
CFI = 0.97	TLI = 0.95	RMSEA = 0.04	SRMR = 0.07	

*Statistically significant ($p < .05$).

In the male group, the only statistically significant effect on writing performance was the intellectual factor (β = .44, t = 6.14), while in the female group, the factors of the intellectual (β = .62, t = 9.42), learning (β = .28, t = 3.36), environmental (β = -.33, t = -2.59), and mental (β = -.31, t = -2.77) domains significantly affected writing performance at the .05 level. When the latent variables of both groups were taken into consideration, it was found only intellectual variables significantly affected writing performance. In the intellectual domain, females (β = .62, t = 9.42) experienced a higher degree of impact on writing performance than males (β = .44, t = 6.14), at the .05 significance level. In terms of the intellectual indicators, which included English proficiency and previous English achievement, females who had high English proficiency (β = .89, t = 44.60) experienced a greater impact on their writing performance than that of high English-proficiency males (β = .82, t = 58.34), at the .05 significance level. However, regarding previous English achievement, the males (β = 1.00, t = 5766.96) experienced a higher effect on

writing performance than females did (β = .92, t = 32.20) at the .05 significance level. This signified the intellectual factors of females (β = .62, t = 9.42) had a significantly greater impact on writing performance than those of males (β = .44, t = 6.14) at the .05 level.

5.4.4 Perceptions of learner factors affecting English writing performance

The final part of the questionnaire was 21 Likert scale items, in which participants were asked to rank their answers from 4 "Strongly Agree" to 1 "Strongly Disagree." It was designed to elicit responses relating to participant perceptions of the factors affecting their writing performance. The frequency, mean, and standard deviation of the participants' responses to all 27 items (items number 9-35) were assessed through the SPSS program (version 22.0) (https://www.ibm.com/support/pages/spss-statistics-220-available-download). The criteria for the Likert scale interpretation of the means are as follows: 1.00-1.75 (strongly disagree), 1.76-2.50 (disagree), 2.51-3.25 (agree), and 3.26-4.00 (strongly agree). The mean scores of the participants' responses to attitudes toward learner factors affecting writing performance suggest participants 'strongly agree' with items 15 and 22; 'agree' with items 16-21, 23, 25-28, and 30-35; and 'disagree' with items 24 and 29. Participants appeared to view out-of-class activity (i.e. listening to English program(s) in item 9) (Mean = 2.18, SD = .87, p = .04) and instrumental motivation (i.e. determination to obtain the 'A' grade in the current English course in item 23) (Mean = 2.98, SD = .93, p = .04) as significant factors affecting their writing performance at the .05 level.

Qualitative analysis of the participants' open-ended responses to the last item (item 36) of the questionnaire were coded, classified, and quantified, and are presented in Table 5.

Table 5
Perceptions of learner factors affecting writing performance (interview-based)

No.	Other factors affecting my writing performance (apart from the given factors from items # 9-35)		Approx. Proportion (%)
36.	Learner factor	Student response	(n = 499)
36.1	Intellectual	Background knowledge about writing topics	28.3 (141)
36.2	Intellectual	English language knowledge (e.g. grammar and vocabulary)	24.1 (120)
36.3	Learning	Reading novels and comic books in English	2.4 (12)
36.4	Learning	Playing game with native English speakers	1 (4)
36.5	Learning	Seeing the English-speaking movies with Thai subtitles	1.2 (6)
36.6	Mental	Mental conditions (e.g. excitement and nervousness) during writing	1.6 (8)
36.7	Mental	Neither feeling free to ask questions in class nor liking studying English	1.4 (7)
36.8	Social	Distant relationship from lecturers	1.4 (7)
36.9	Social	Family pressure on achieving good grades	1 (5)
36.10	Environmental	Classroom surroundings (e.g. construction noise)	1 (4)

The analysis of the last-item responses ("*Other factors affecting my writing performance apart from the given factors from item numbers 9-35*") from Table 5 demonstrates the intellectual group (i.e. background knowledge about writing topics and English language knowledge) was the most highly rated (items 36.1 and 36.2, respectively). Some participants viewed learning factors through out-of-class English learning activities (items 36.3-36.5), mental, social, and environmental factors also as influencing their writing performance (items 36.6-36.10, respectively). Interestingly, on a willingness-to-respond basis, the qualitative data are consistent with the quantitative, in terms of all factor-type coverage and the intellectual factor group being the most highly rated.

6 Discussion, implications, and recommendations for future research

Following the analyses of triangulated data from the mixed approaches employed in this study (Edmonds and Kennedy, 2013), through quantitative lenses, the statistically significant findings reveal a relatively close connection between the participants' learner-factor indices and their attitudinal scores. That is, the significant influence of intellectual factors on the writing performance of participants (Table 2) correlates with their attitudes toward instrumental, extrinsic, or controlled motivation on writing performance (questionnaire item 23, Section 4). The importance of instrumental motivation in language learning was observed by Dörnyei (2002: 124), that "*... the process of language learning is a means to achieve other goals through the knowledge of the L2 ....*" This supports the result of the current study that the majority of participants (355 out of 499 or approximately 71%) expressed their need for succeeding in the English-language course (Mean = 2.98, SD = .93, p = .04) at the .05 significance level. A thought-provoking message is that the participants' high level of determination to be successful was expressed in the statistical significance of their instrumental motivation. Noticeably, patterns of human motivation are denoted by varying levels of needs (Dörnyei, 2002). According to Maslow's (1970) hierarchy of needs, when our basic needs are fulfilled, we are typically motivated to move to fulfill higher level needs (i.e. physiological, safety, belonging and love, esteem, and self-actualization). However, the COVID pandemic has completely transformed education systems and way of life needs. The pandemic caused Thai educational institutions to close, delaying Thai students' learning progress and causing mental health problems (Lao, 2020). Moreover, all students transitioned from physical classrooms to virtual ones, which required technological knowledge to use (Ortega, 2020). However, digital technology and technological problems are two sides of the same coin. Due to technical problems in online placement exams, a number of students were anxious about being unable to submit their answers (Gross, 2020). Similarly, the current study partly experienced the beginning of the COVID-19 pandemic, causing the university's temporary shutdown, during data collection. Some participants could not be contacted, despite having virtual classes. Others reported that they neither had paper scanners in their houses nor wanted to return the questionnaire via their mobile phones.

Next, this study showed female participants' higher English-language performance compared to males is consistent with established cross-sectional (Al-Saadi, 2020; ETS, 2007; University of Cambridge, 2006) and longitudinal (ETS, 2007; James, 2014) studies of gender. Such instances are the studies by University of Cambridge (2006) utilizing the 2004 standardized IELTS scores, ETS (2007) using the 2005-2006 average TOEFL-iBT scores, James (2014) employing a 2-year longitudinal study of Thompson Rivers University (Canada) test scores of 494 ESL participants from 47 countries, and Al-Saadi (2020) using 77 Omani EFL undergraduates' argumentative writing scores on the Oxford Placement Test as the English-performance indicator. Though these studies were conducted from either diverse or similar educational backgrounds (i.e. EFL and ESL contexts) and research components (i.e. participants and research tools), they similarly observed females achieving higher English performance than males. Additionally, research by Al-Saadi (2020) suggests female undergraduates' higher level of writing performance may be derived from their motivation to write.

Notwithstanding most participants' motivation to obtain the 'A' grade in the English course, some voiced their unwillingness to engage in the course through their interview-based questionnaire responses. 2.6% of participants indicated their openness to non-conforming gender identities (Table 1) and approximately 54% of participants who gendered themselves as 'other' reported the remote student-teacher relationship caused their unwillingness to communicate and to dislike language learning, which constrained their English learning engagement. Teachers and/or teaching methodology are additional key factors affecting students' motivation levels (Chong et al., 2019; Renandya, 2020). The participants also viewed their relationships with teachers as affecting their writing performance (items 36.7 and 36.8, Table 5). In writing composition classes, student-teacher interaction is necessary for student learning (Gibbons, 2002) and second language development (Gass, Behney

and Plonsky, 2013). According to Vygotsky (1978), interaction promotes cognitive development. Student-teacher conversation can then boost or obstruct critical thinking and writing development. Thus, the participants' unwillingness to communicate with their teachers causing their avoidance of learning engagement in the present study may be from a lack of verbal scaffolding representing "the distance between what students can do on their own and what they require assistance with" (Gass et al., 2013: 532). Furthermore, based on the result of distant relationship between students and lecturers (item 36.8, Table 5), more research into the impact of gender on teacher-student social interaction and students' English writing performance is worth considering.

Apart from the issue of social interaction as mentioned above, learning materials and the taught English language are worth highlighting. There are several English-language commercial and/or in-house materials presenting gender-stereotyped vocabulary and contexts (e.g. the pronouns '*s/he*' and '*businessmen*') (Flood, 2016). Thus, the careful selection and use of gender-neutral English-language in those teaching and learning materials are proposed to promote student safe spaces, leading to meaningful learning engagement and thus writing-skill mastery. Another more challenging thought would be to personalize tailor-made materials with gender-neutral English language (e.g. using the pronoun '*they*' instead of '*s/he*' and '*business people*' instead of '*businessmen*') through digital collaborative writing spaces. The data-driven analysis of commercial gender-inclusive materials or a sufficient number of the teacher-student collaborative texts is suggested and this may cater to the diverse needs of learners in the second-language context.

Based on the parallelism between the quantitative and qualitative results of the most highly-rated intellectual factor group from the Likert-scale and interview-based questionnaire parts (Tables 2 and 6, respectively), aside from the participants' aforementioned instrumental motivation, their background and English-language knowledge about writing topics were also perceived as influential factors to their writing performance. In the present study, the participants were required to choose one out of three given source texts and provide logical arguments for and against their selected texts in their writing. It has been observed that the text genre enables learners to apply their prior knowledge to extract the meaning of what is read effectively (Brown, 2004: 187). The learners also reported that their ability to interpret and comprehend writing topics depends on prior knowledge and knowledge of English. That is, their background knowledge or content schema about the writing topics and knowledge of grammar and vocabulary had contributed to the ability to produce their own ideas expressed in the form of written texts (Ferris and Hedgcock, 2014). The participants' perceived awareness of the importance of English language knowledge (i.e. grammar and vocabulary) would still necessitate form-focused instruction (Brown, 2007: 276). With the educational transformation from physical classroom instruction to digital classrooms, an investigation into the extent that form-focused instruction through digital interaction affects learners' writing performance in virtual classroom contexts would be suggested.

On different aspects of learning assessment, the formative assessment covering in-class and out-of-class learning activities is generally weighed less than summative assessments in an English-language course in the Thai higher education context. However, summative assessment through tests or exams given only within a specified time may not be sufficient to appraise learners' learning and writing outcomes. In other words, formative assessments should be considered in addition to the summative ones in justification of learners' writing performance (Irons, 2008). It is suggested the number of summative assessments be reduced, while formative assessments should promote student learning (Irons, 2008: 136). A correspondence between the main findings regarding the impact of formative assessments in the form of out-of-class activities on writing performance (Table 2 and questionnaire item 9 in Section 4) and the qualitative findings of the students' interview-based questionnaire responses (items 36.3-36.5, Table 5) has turned the attention to formative assessment. These findings highlight that further research into how teachers' digital formative feedback embedded in formative assessment encourages students' online learning and writing performance would be suggested. Additionally, how formative feedback, particularly in writing instruction, enhances

students' online writing and their independent learning through virtual classrooms should also be explored.

7 Conclusion: Directions for writing instruction

In response to raising quality human resources and education being placed on the main agendas of Thailand's National Strategic Plan (2018-2037) (https://sto.go.th/en/about/policy/20-year-strategic-plan), the United Nations' SDGs regarding quality education, and outcome-based English-language higher-education policies, the findings of this learner-factor study suggest viable alternatives in the following areas:

7.1 Quality education: English and digital literacies, knowledge sustainability and accessibility

The present study was conducted amid COVID-19, which forced us to change our ways of life. The inclusion of such human basic needs, important to motivation as another learner-factor domain affecting writing performance should then be considered. Such transformation has spread over educational ecology in the forms of disrupted learning-instruction patterns, behaviors, and styles. Under the concepts of educational quality and equality, the students from the suburbs in Thailand can virtually take courses from universities around the world in the same way as those from other countries. Ortega (2020) stated that "*everywhere in the world, historically oppressed identity groups are disproportionately affected by COVID-19*." An abrupt change from physical classroom communication to the online may cause discrepancies in education quality, particularly for those who have financial burdens and/or problems of Internet accessibility frequently found in rural areas (Lao, 2020). Through online-based platforms, students' socioeconomic domain is a variable affecting their writing performance and is worthy of future study. Additionally, with equally easy online access, students should necessarily have the abilities of both communicating in written English and using digital technology. Nonetheless, it is uncertain that completely online learning and instruction will last forever. Other cautious approaches to knowledge sustainability, either online or offline, would suggest future studies be undertaken of instructional design to enable students to engage in and experience their learning. Such studies could involve tailor-made interdisciplinary lessons, with the provision of formative assessment. Prior to the actual use of such lessons to university faculties, corpus-based language learning research on collocations in interdisciplinary lesson content should be conducted to ensure their practicalities. Such findings could serve as evidence from which to create a future English course syllabus.

7.2 Quality human resources: The learner's consciousness and identity, learning autonomy, and gender equality

Not only education systems but also traditionally fixed mindsets need to be transformed. The pandemic has surprisingly encouraged learners, inclusive of GLLs, and teachers to get out of their comfort zones. Since several questionnaire responses, in the current study can be seen as reflecting as the students' consciousness of their language learning situations, the consideration to the inclusion of learners' consciousness-raising in language learning is likely to be one of the striking characteristics of GLLs. Based on the questionnaire responses, a few ungendered participants expressed their self-identities and out-of-class independent learning through the use of their Thai names when speaking English in digital game-playing with native English speakers. A blend of localization by establishing and maintaining self-identity and learning autonomy with globalized language learning via virtual classroom would be new challenges to the post-COVID teacher roles. Moreover, the findings of the interview-based responses further voiced the additional aspect of the SDGs in gender equality, which is also linked with the SDGs in quality education. Thanks to the ungendered group's

revelation about the additional factors limiting their English language learning and writing performance, relevant proposals for the use of gender-neutral English-language in teaching and learning materials and the inclusion of discipline-specific task types in the first-year English writing courses would be ways to support students' learning strategies.

The importance of learners' optimal learning has recognized the stages that further interpersonal, social, and language skills to be independently honed, once students have safe space for learning involvement (Gass et al., 2013). It is stated, by Benjamin Franklin (1706-1790), "tell me and I forget, teach me and I may remember, involve me and I learn." Additionally, individual variations like self-consciousness, self-identity, and learning independence from the study results are proposed to be featured and encapsulated, if possible, in the characteristics of GLLs. This is to promote the learning attitudes of non-native English learners, particularly those who do not like English, to eventually be like those of successful English learners and to develop learners' writing performance intellectually and emotionally. Overall, the proposed research directions arising from the findings of the current study would be a part of education ecology for academia, contributing to the development of quality human resources and post-pandemic English writing instruction in higher education in Thailand.

8 Limitations of the study

Any generalizations from the results of the study should take account of the following limitations. Based on the decision to keep the names of the university and the students anonymous, the study results are not generalized to all first-year Thai undergraduates from other universities in Thailand. Next, the pandemic shifted the very beginning of the data collection process, since some copies of the questionnaire were initially distributed in physical form and some sections were online. This may have lowered, the response rate to the questionnaire.

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