Using the UTAUT2 model to determine the factors affecting students' acceptance of blended learning for English writing

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ABSTRACT

The study aimed to determine the factors that affect students' acceptance of blended learning for English writing. The authors employed Venkatesh et al.'s UTAUT2 and Bandura's social cognitive learning theory to model the measurement scale, and the questionnaires were delivered to 152 students at a university in Vietnam. The findings show that students' acceptance of BL was substantially influenced by their *behavioral intention to use BL* and slightly by their *self-efficacy*. Among the core constructs of UTAUT2, *performance expectancy* was the most influential on *self-efficacy* and *behavioral intention to use BL*. In addition, while *effort expectancy* moderately impacted students' *self-efficacy* beliefs, *facilitating conditions* slightly influenced their *behavioral intention to use BL*. However, hypothesis testing concurrently rejected the causal relations between *self-efficacy* and *performance expectancy*, *social influence*, and *facilitation condition*. In another relation, *social influence* was not found to influence *behavioral intention to use BL*. Regarding the moderators, *academic performance* and *ICT skills* were found to positively affect the relation between *behavioral intention to use BL* and *use behavior of BL*. The systems information in the newly validated model offers some major implications for increasing students' acceptance of BL for English writing.

Keywords: effort expectancy, performance expectancy, social influence, facilitating condition, self-efficacy, intention to use, use behavior

Introduction

Blended learning (BL) has been used in Western countries for decades; however, its implementation in Asian countries has been conspicuous for approximately 10 years, notably since the COVID-19 pandemic (Shaikh et al., 2020; Tran, 2024). Recently, it has been depicted as a "hot topic" in education. Hashemi and Na (2020) noted that BL is the 21st-century best practice for promoting the best of online and face-to-face learning environments in which students have some control over their learning path.

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In teaching and learning English writing, BL facilitates collaboration, improves assessment, provides references, and expands engagement (Hashemi & Na, 2020). Compared with other learning modes, BL is much more ideal for EFL writing learning than an online or face-to-face class mode (Ghahari & Ameri-Golestan, 2013). In addition, Quvanch and Kew (2020) reviewed BL research in 25 relevant articles published between 2010 and 2020 and reported that 88% of them indicated that BL improved numerous aspects of students' writing.

Specifically, BL positively enhances students' English writing skills (Ataizi & Komur, 2021; Charernwiwtthanasri, 2021), writing competence (Arta et al., 2019), writing performance (Hassan et al., 2021; Rahman, 2018), writing achievements (Ramadaniah et al., 2022), accuracy (Adas & Bakir, 2013; Torabi, 2021) and autonomous learning (Ghahari, & Ameri-Golestan, 2013; Umamah et al., 2024). With respect to linguistic features, Adas and Bakir (2013) reported that BL helps students improve topic sentences, spelling, grammar, punctuation, capitalization, and coherence. In addition, Shaikh et al. (2020) asserted that BL students use better content, content sufficiency, organization, and language expression. In short, language use and genres reportedly improved when students learned English writing in a BL model.

As described above, virtually all earlier researchers reported the benefits of using BL, and many of them called for the incorporation of this learning model to teach English writing (i.e., Ataizi & Komur, 2021; Challob et al., 2016; Tran, 2024); nonetheless, the factors affecting students' acceptance of BL remain under-researched. In response, the authors of this research adopted Venkatesh et al.'s unified theory of acceptance and use of technology (UTAUT) (2013) and Bandura's (2002) social cognitive learning theory (SCLT) to bridge this gap and estimate EFL students' acceptance of BL for writing. Ultimately, the research aimed to address the following research question:

What factors affect students' acceptance of BL to study English writing?

The findings are expected to provide systems information for developing new knowledge and innovations in applying BL and personalizing the BL environment for English writing to increase its efficacy. Accordingly, the statistical analysis of BL environmental factors, students' characteristics, and their behaviors helped predict how their attitudes and intentions could be changed to increase their adoption of BL in an English writing context.

Literature review

Theorized research model

BL has been defined as "the strategic combination of online and in-person learning" (Graham, 2021, p. 13). The online part is a key component in deciding whether a course is with BL; thus, it can be inferred that BL cannot occur without technological tools. In a BL course, Caner (2012) postulated that face-to-face sessions might be supported by technologies such as televisions, CD players, computers, or projectors, but the online part must rely on web-based tools. In writing, Nuri and Bostanci (2021) ascertained that the online learning mode of BL is more efficient for students' writing performance than the pen-and-paper mode because the internet is rich in learning resources that students can exploit to support their writing. Accordingly, understanding students' acceptance of information and communication technology (ICT) tools in a BL course can help facilitate their use of this learning model.

The literature reveals that some popular research models used to estimate the adoption of technology are the theory of reasoned action, the theory of planned behavior, the technology acceptance model, and the unified theory of acceptance and use of technology (UTAUT)

(Callum, 2011; Nguyen & Chu, 2021; Venkatesh et al., 2003) and UTAUT2 (Dakduk et al., 2018; Norman, 2022; Venkatesh et al., 2013). Among the mentioned models, Venkatesh et al.'s UTAUT2 (2013) is the most comprehensive, as it is the result of the revision and extension of a host of earlier models, and the calculation features both the technical aspects and the psychological features of using it (Bogart & Wichadee, 2015).

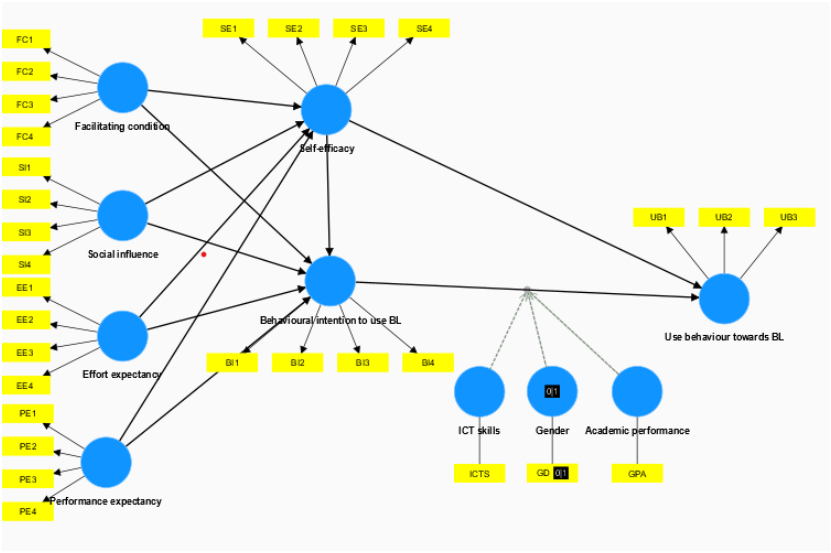
Specifically, user acceptance of ICT in UTAUT 2 is predicted through UTAUT's four original constructs (*effort expectancy*, *performance expectancy*, *facilitating conditions,* and *social influence*), three extended constructs (*enjoyment*, *self-efficacy*, and *learning management*), and four moderators (*gender*, *age*, *voluntariness,* and *experience*). Although UTAUT2 was originally used to estimate technology adoption, this high-stakes model has been justified in predicting students' acceptance of BL in recent years. For example, Azizi et al. (2020) modified UTAUT2 with extended constructs (*price value*, *hedonic motivation*, *habit*) as control variables to explore medical students' use of BL in Iran. Later, in 2022, Norman (2022) removed the moderating constructs of the original UTAUT2 and drew on the core constructs to understand college students' acceptance of BL in Zimbabwe. In the same year, Li et al. (2022) removed the *behavioral intention to use BL* from UTAUT2 to investigate secondary vocational school students' acceptance of BL in China.

Theoretically, UTAUT2 defines people's acceptance of ICT by gauging the varying influences of environmental factors, users' beliefs, and their characteristics on their behavioral intention to use or usage behavior (Shachak et al., 2019; Venkatesh et al., 2013). This theoretical framework is akin to Bandura's SCLT (2002), which posits that development is subject to the reciprocal influences of environmental, behavioral, and personal factors. In particular, the environment directly affects people's beliefs and indirectly influences their behavior via their beliefs, and in a deeper relation to their behavior, their cognitive ability directs their behavioral enactment. As a result, we argue that when Bandura's SCLT (2002) works in collaboration with Venkatesh et al.'s UTAUT2 (2013), UTAUT2 constructs are better rationalized and arranged to comprehensively estimate the effects of the BL environment on EFL students' adoption of BL.

Overall, earlier researchers relied on their specific study contexts to decide on a UTAUT2 version, which was, explicitly or implicitly, based mostly on social constructivism, to focus on students' perceptions of the influencers of the BL environment. While the calculation mainly targeted the direct effects of the exogenous construct on its endogenous one(s), the indirect effects were neglected in most research. In this study, Venkatesh et al.'s UTAUT2 (2013) and Bandura's SCLT (2002) were adopted to consider the direct and indirect relationships among certain constructs in the theorized model.

As shown in Figure 1, the theorized model consisted of 10 constructs. Specifically, *effort expectancy*, *performance expectancy*, *social influence,* and *facilitating conditions* were jointly hypothesized to influence *self-efficacy* and the *behavioral intention to use BL,* whereas *self-efficacy* was theorized to impact the *behavioral intention to use BL* at the same time. In addition, *self-efficacy* and the *behavioral intention to use BLs* were assumed to influence *use behavior toward BL*. Finally, the relationship between the *behavioral intention to use BL* and *use behavior toward BL* was hypothesized to be impacted by ICT skills, academic performance, and gender.

Figure 1.
Hypothesized model (Source: Venkatesh et al.*, 2013)*



The new feature of the hypothesized model above is that it comprehensively assesses the individual, environmental, and behavioral factors that are likely to affect students' acceptance of BL for English writing, both directly and indirectly. In addition, *self-efficacy* was first hypothesized to impact the *behavioral intention to use BL* and concurrently work in parallel with the *behavioral intention to use BL* to predict *use behavior toward BL*. In particular, *gender*, *academic performance,* and *ICT skills,* understood as the personal qualities of users in UTAUT2 to moderate the causality between the ICT environment and their attitudes, were first employed as personal factors (Bandura, 2002) to moderate the relationship between *behavioral intention to use BL* (attitude) and *use behavior toward BL* (behavior).

Hypothesized relationships among the constructs

Performance expectancy (PE) refers to the degree to which people believe that using technology can increase their performance results (Callum, 2011; Venkatesh et al., 2013). PE is similar to Davis's perceived usefulness (1989) - "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320). This definition of PE, which was originally employed to assess ICT alone, is now broadened to encompass BL as a system; thus, this construct does not need to be redefined but rather modified slightly to fit into this study context. In nature, PE is grounded in extrinsic motivation (Callum, 2011) or achievement motivation (Sabti et al., 2019; Wilby, 2020), which is a strong determinant of attitudes toward BL or the intention to use it (Davis et al., 1992). The literature also indicates that PE influences people's intention to perform a behavior (Azizi et al., 2020; Dakduk et al., 2018; Norman, 2022); therefore, the hypothesis (H) between PE and self-efficacy and the behavioral intention to use BL is stated below.

H_1: *PE is positively related to the behavioral intention to use BL*.

H_2: *PE is positively related to self-efficacy*.

Effort expectancy (EE) refers to the degree to which people believe that technology is easy to utilize (Venkatesh et al., 2013). This term shows some analogy with Davis' perceived ease of use (1989), which refers to "the degree to which a person believes that using a particular system would be free of effort" (p. 320). Additionally, EE is a type of motivation that has the most marked effect on students' achievements (Anam et al., 2019) or has a significant positive

relationship with students' social media usage (Sarwar et al., 2019). In BL research, Azizi et al. (2020) and Norman (2022) reported that EE is a good predictor of students' intention to use BL. EE was originally employed to predict learners' acceptance of ICT, and in this BL research, it was modified to fit the study context. Moreover, Davis et al. (1992) and Venkatesh et al. (2003) posited that the easier the technology is, the more effort will be put into the task, and the better performance people can produce. Therefore, the relationships between EE and self-efficacy and between EE and the behavioral intention to use BL are described below.

H3: *EE is positively related to the behavioral intention to use BL*.

H4: *EE is positively related to self-efficacy*.

Next, *social influence* (SI) gauges the degree to which users' adoption of technology is influenced by the others around them (Venkatesh et al., 2003, 2013). Sabti et al. (2019) and Wilby (2020) added that peer influence is a type of motivation that affects students' beliefs and attitudes in the classroom. Similarly, Bandura (2002) argued that the successes of others motivate people of the same interest group, and in Molinillo et al.'s view (2018), social presence influences students' active learning, interaction, and learning performance. Empirically, SI reportedly positively affects students' intention to use BL (Azizi et al., 2020; Norman, 2022) and positively influences their actual use of BL (Li et al., 2022). Because SI is a type of external motivation, it is treated as a predictor of behavior (Ajzen, 1991); consequently, the relationships between SI and self-efficacy and between SI and the behavioral intention to use BL are hypothesized below.

H5: *SI is positively related to the behavioral intention to use BL*.

H6: *SI is positively related to self-efficacy*.

Facilitating conditions (FCs) measures the degree to which people perceive that there is sufficient support and assistance available to use technology (Venkatesh et al., 2003, 2013). When examining the correlation between FC and motivation, Ryan and Deci (2000) argued that motivation is facilitated *or* forestalled by social and contextual conditions. FC has been reported to be the direct determinant of acceptance of ICT (Abbad, 2021; Nguyen & Chu, 2021), and in the BL context, FC has been reported to positively impact the behavioral intention to use BL (Azizi et al., 2020; Dakduk et al., 2018; Norman, 2022) and the actual use of BL (Li et al., 2022; Venkatesh et al., 2003). Callum (2011) postulated that FC lowers students' anxiety about using ICT for learning and spurs adoption to increase outcomes; as a result, the relationships between FC and self-efficacy and behavioral intention to use BL are stated below.

H7: *FC is positively related to the behavioral intention to use*.

H8: *FC is positively related to self-efficacy*.

Self-efficacy (SE) refers to people's belief in their own ability to perform the courses of action required to produce given attainments (Bandura, 2002; Pajares et al., 2003). Li et al. (2022) added that SE spurs people to gain achievements through their skills, and it has been empirically found that those with higher SE are more likely to complete a given task (Callum, 2011; Li et al., 2022). SE in writing refers to writers' confidence that they can possess specific writing skills or complete a writing task (Pajares et al., 2003), and Li et al. (2022) reported that SE positively impacts students' actual use of BL. Overall, SE can likely predict people's intentions and actions; therefore, SE in this study was hypothesized to impact the behavioral intention to use BL and the actual use of BL.

H9: *SE is positively related to the behavioral intention to use BL*.

H_{10}: *SE is positively related to use behavior toward BL*.

Behavioral intention to use BL (BI) measures people's attitudes toward using technology via their overall emotional reactions (Venkatesh et al., 2003). Ajzen (1991) defined attitude as "the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (p. 188), whereas Davis (1989) referred to attitude as the negative or positive feelings of performing a behavior and claimed that ATU determines whether people use the technology. Empirically, BI has been found to be a great determinant of the actual use of ICT (Nguyen & Chu, 2021; Venkatesh et al., 2003) or the actual use of BL (Azizi et al., 2020; Dakduk et al., 2018; Norman, 2022). In the context of writing, BI was modified slightly to fit the BL context for English writing, and it is hypothesized to affect students' actual use of BL, as described below.

H_{11}: *BI is positively related to use behavior toward BL*.

Use behavior toward BL (UB) refers to the act of using technology (Venkatesh et al., 2003, 2013). Li et al. (2022) defined UB as "the level of acceptability of a certain thing" (p. 7), whereas Norman (2022) defined UB as the actual use of BL for academic purposes. Assessing the relationship between UB and BI, Ajzen (1991) claimed that the stronger the intention to engage in a behavior is, the more likely it is to lead to performance. Empirical research on BL has revealed that UB is directly impacted by BI (Azizi et al., 2020; Dakduk et al., 2018; Norman, 2022). In this study, BI was assumed to be affected by SE and BI, as indicated in H_{10} and $H_{11,}$ respectively.

People's capabilities differ in their psychobiologic origins and the experiential conditions needed to enhance them; thus, their learning and development are closely related to their mental and physical characteristics (Bandura, 2002). Some previous research has provided evidence that students' gender (GD) plays a part in varying their adoption of ICT use and motivation (i.e. Venkatesh et al., 2003). In this research, GD was adopted as a moderator and was hypothesized to affect students' acceptance of BL. Accordingly, GD was measured as a direct quantitative variable and represented by 1 (male) and 0 (female), and it was theorized to affect students' acceptance of BL below.

H_{12}: *GD has a moderating effect on the relationship between BI and UB*.

Academic performance (AP) is the realization of what students acquire and is usually quantified as a score. Students of different ability groups tend to behave differently in their learning (Chu & Nguyen, 2022); as a result, although AP was not originally introduced by Venkatesh et al. (2003) in his UTAUT2, the AP in this research should be scrutinized to help understand how EFL students of different ability groups use BL for English writing. To do that, in this study, AP was represented by EFL students' overall scores and was rated as 1 for poor students (below 4), 2 for below average students (4–5.4), 3 for average students (5.5–6–9), 4 for good students (7–8.4) and 5 for good students (8.5 or higher). The division of student scores was based on the guidance of the Regulation on Tertiary Education (Vietnam Ministry of Education and Training, 2021), while AP was theorized to moderate the relationship between BI and UB as follows.

H_{13}: *AP has a moderating effect on the relationship between BI and UB*.

ICT is an essential part of a BL course. Puentedura (2006) categorized the functions of ICT tools as substitution, augmentation, modification, and redefinition and argued that using them requires a range of skills, such as locating and retrieving information, creating materials, or interacting. Callum (2011) defined ICT skills as the degree to which people can use ICT tools to address various tasks. Originally, Venkatesh et al. (2003) introduced experience in ICT as a moderator of user acceptance of ICT; however, it is argued in this research that more experience

does not entail skilled use of ICT. Furthermore, Hackbarth et al. (2003, as cited in Callum, 2011) reported that students with good ICT skills are more likely to adopt new technology. Hence, students' ICT skills would be a better construct to explore as a moderator of their acceptance of BL. In particular, EFL students rated their ICT skills on a five-point scale, with poor skills being the best. Thus, the hypothesis about ICT skills is stated below.

H_{14}: *ICT skills have a moderating effect on the relationship between BI and UB*.

In summary, the need-to-be-validated research model consists of 10 constructs, and the relationships among them are stated in 14 hypotheses. The addition of SE, which acts in parallel with BI (Figure 1), is a *new* feature of UTAUT2 in this research. An analysis of the measurement and structure models thus provides a new understanding of how EFL students are willing to accept BL for English writing.

Methods

Technology plays a vital role in modern education (Vo et al., 2024). Tran (2024) reported that Vietnamese students generally possess good ICT skills, have easy access to technology, and like to use ICT in their studies. In addition, Umamah et al. (2024) reported that when studying online, high-motivation students apply more self-regulation in task strategies, time management, help-seeking, and self-evaluation. This partly explains why the facilities are sufficient for BL models to be placed, especially at the tertiary level.

However, as understanding the factors affecting students' acceptance of BL in English writing is limited in the literature, the authors employed exploratory sequential mixed methods research, as suggested by Creswell and Creswell (2018). As an exploratory research design to validate a theoretical model for understanding the factors that influence students' acceptance of BL for English writing, this study aimed at the replicability of the research design rather than the generalizability of the findings to broad populations.

Unlike previous studies based on Venkatesh et al.'s UTAUT (2003) or UTAUT2 (2013), this study was grounded in the collaboration of UTAUT2 and Bandura's SCLT to model the hypothesized research scale, in which a new understanding of BL for English writing can be established. In the first stage, the authors examined earlier findings on BL, BL for writing, Bandura's SCLT, and UTAUT2 to locate the core, extended, and moderating components of UTAUT2 for the BL context. All the theorized constructs were then problematized and included in the questionnaire, which helped generate data to understand the research problem.

The respondents were 152 English major students who were learning English correspondence in a BL course in the synchronous learning online mode. We chose four classes on the basis of convenience sampling (Creswell & Creswell, 2018) because there were four classes at the time of the study. They spent the first half of the course in the classroom and the remaining time online. Statistically, 77.63% were females, and 98.05% were in their second year. With respect to ICT literacy, 81.57% of the sample claimed to have sufficient ICT skills to study English writing in a BL model, and 94.74% reported that they were satisfied with BL for English writing. In short, the demographic information indicates that the sample size of 152 students was sufficient for an exploratory research design (Hair et al., 2017) and could generate appropriate data for the study project.

The instrument used to collect the data were a questionnaire with two sections. Section one mainly targeted the sample's demographic information. Additionally, they were requested to report their midterm writing scores, which represent their academic performance, and rate their

skills in using ICT for learning to write English on a five-point scale (*very poor, below average, about average, above average, good*). Some of the information (gender, ICT skills, and academic performance) provided in this section was used as the moderating construct in the hypothesized model.

Section Two featured seven constructs with their corresponding indicator variables. The core and extended constructs of UTAUT2 were adopted from earlier research and justified to make them work for the BL context for English writing. The construction of the theorized model was guided by Creswell and Creswell (2018), and the inclusion and arrangement of 10 theorized constructs drew on Bandura's SCLT (2002) and Venkatesh et al. (2013).

The questionnaire data were mostly quantitative; thus, data analysis was performed via PLS-SEM. After the data were input into the computer, the calculations involved measurement and structural modeling, as per Hair et al. (2017). The multistage analysis helped check the reliability and validity of the instrument and quantify the impacts of the causative factors on students' acceptance of BL for English writing.

Findings

Measurement model assessment

The original measurement model consisted of 27 variables that formed 7 multiple-indicator constructs. The first step was to determine the indicator reliability through outer loadings, which should be .40 or higher (Hulland, 1999, as cited in Hair et al., 2017). Table 1 shows that all the indicators were retained because they contributed significantly to their corresponding latent variables. With this result, the authors could assess the validity and reliability of each construct.

Table 1.

Outer loadings of the indicator variables

	BI	EE	EP	FC	SE	SI	UB
BI1	0.874						
BI2	0.898						
BI3	0.886						
BI4	0.909						
EE1		0.785					
EE2		0.860					
EE3		0.850					
EE4		0.800					
PE1			0.852				
PE2			0.910				
PE3			0.840				
PE4			0.879				
FC1				0.830			
FC2				0.861			
FC3				0.796			
FC4				0.627			
SE1					0.842		
SE2					0.895		

SE3					0.897		
SE4					0.886		
SI1						0.818	
SI2						0.846	
SI3						0.814	
SI4						0.689	
UB1							0.899
UB2							0.952
UB3							0.933

The next step is assessing the construct reliability through Cronbach's alpha and composite reliability (rhro_a), which should be .70 or higher (Hair et al., 2017). With respect to those thresholds, Table 2 indicates that all the constructs met this requirement. In addition, Hair et al. (2017) posited that the convergent validity expressed by the average variance extracted (AVE) should be .50 or higher. The statistics in Table 2 also show that the AVEs of all the constructs superseded the threshold level, meaning that all the constructs met the requirements of convergent validity. The validity and reliability indexes imply that the indicators are convergent enough to form their corresponding latent constructs.

Table 2.

Construct validity and reliability

Constructs	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
BI	0.914	0.915	0.939	0.795
EE	0.842	0.845	0.894	0.679
EP	0.893	0.895	0.926	0.758
FC	0.787	0.810	0.863	0.614
SE	0.903	0.904	0.932	0.775
SI	0.802	0.811	0.871	0.630
UB	0.919	0.921	0.949	0.861

The authors then checked the discriminant validity. Hair et al. (2017) proposed that for the Fornell and Lacker statistics, the AVE square root of each construct should be greater than the correlations among the constructs. Table 3 indicates that all the constructs met the acceptable level of discriminant validity. This result reveals that the tested constructs are divergent enough to exit as separate ones. To understand more about the discriminant validity, the author proceeded with examining indicator collinearity.

Table 3.

Discriminant validity

	BI	EE	EP	FC	SF	SI	UB
BI	**0.892**						
EE	0.732	**0.824**					
EP	0.801	0.792	**0.871**				
FC	0.728	0.811	0.737	**0.784**			
SE	0.742	0.738	0.741	0.697	**0.880**		
SI	0.589	0.673	0.641	0.707	0.596	**0.794**	
UB	0.897	0.656	0.772	0.657	0.744	0.556	**0.928**

The final step of assessing the measurement model involved indicator collinearity. Hair et al. (2017) posited that when the tolerance value (VIF) of each construct falls within the range of .20-5, there is little or no possibility of collinearity among the indicator variables. The statistical analysis revealed that the lowest index was FC4 (1.297), and the highest index was UB4 (4.803). The VIFs of all the indicators met the acceptable level, and collinearity did not occur in the measurement model.

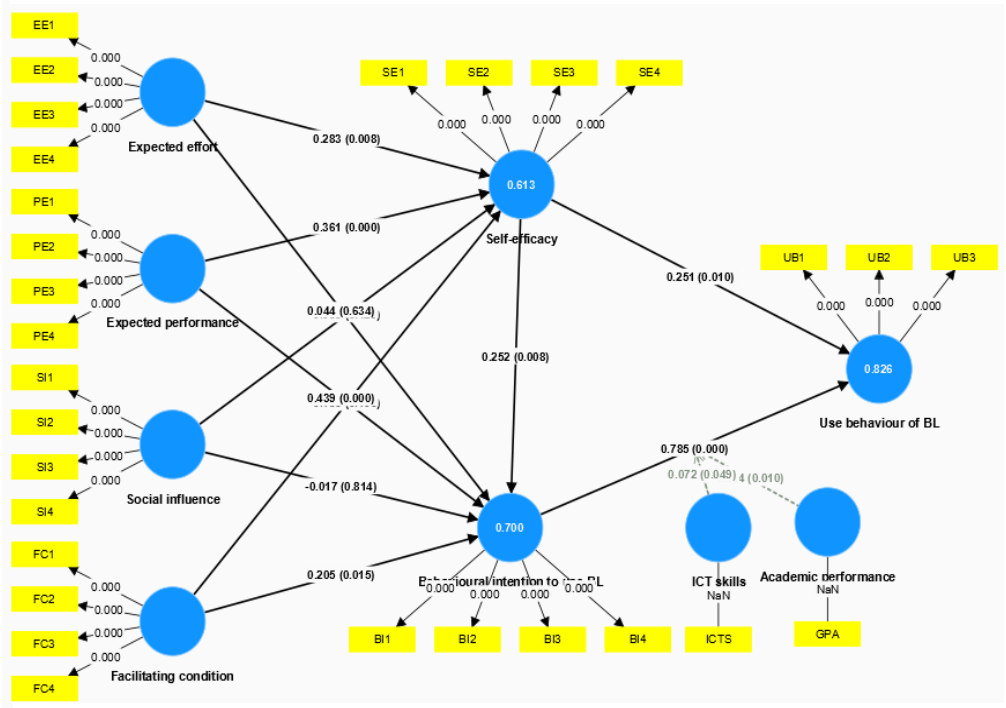
Structural model assessment and hypothesis testing

Assessing the structural model begins with the model fit index. According to Hair et al. (2017), an estimated model index of .80 or lower meets the requirement for being fit. The statistical analysis revealed that the estimated model was .059, indicating that the model was effective in determining the factors affecting students' acceptance of BL for English writing.

The next step was to examine the coefficients of determination (R^2) to determine how much an exogenous construct could explain the variance of an endogenous one. Hair et al. (2017) postulated that R^2 values of .75, .50, and .25 for an exogenous construct are treated as *substantial*, *moderate,* and *weak* explanations, respectively. The statistical analysis in Figure 2 shows that EE, PE, SI, and FC together explained 61.3% of the variance in SE, whereas their combination with SE explained 70% of the variance in BI. SE and BI together explained 82.6% of the variance in UB. This result means that UB, BI, and SE were substantially explained by their corresponding exogenous constructs.

Figure 2.

Structural equation model



Measurement model: P values

Structure model: coefficients of determinations and P values **Construct:** R^2

With respect to predictive relevance (Q^2), the authors relied on blindfolding to examine cross-validated redundancy measures for three endogenous constructs (SE, BI, UB). Hair et al. (2017) postulated that the Q^2 values of .02, .15, and .35 indicate that an exogenous construct has small, medium, and large predictive relevance for a certain endogenous one. The statistical analysis provided values of .476, .548, and .695 for SE, BI, and UB, respectively, indicating that the partial models with SE, BI, and UB as their endogenous constructs have high predictive relevance.

Next is the path coefficient, which means that the higher the value is, the more influential it is on its endogenous value. Analytically, path coefficients are assessed via their significance and size. First, the P value should be less than .05 to be statistically significant (Hair et al., 2017). Under this reference, Table 4 indicates that the effects of EE on BI, SI on BI, SI on SE, and FC on SE were statistically insignificant; therefore, H_3, H_5, H_6, and H_8 were rejected. The rejection means that statistically, SE was affected by EE, FC, and SI, and in another relationship, BI was not influenced by SI either.

Table 4.

Size and significance of coefficients of determination

Hypotheses	Relations	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	f-squared	P-values	Acceptance
H1	PE -> BI	0.439	0.433	0.092	0.202	0.000	Yes
H2	PE -> SE	0.361	0.364	0.100	0.117	0.000	Yes
H3	EE -> BI	0.044	0.043	0.093	0.002	0.634	No
H4	EE ->SE	0.283	0.278	0.107	0.054	0.008	Yes
H5	SI -> BI	-0.017	-0.019	0.073	0.000	0.814	No
H6	SI -> SE	0.065	0.065	0.082	0.005	0.429	No
H7	FC -> BI	0.205	0.210	0.084	0.040	0.015	Yes
H8	FC -> SE	0.156	0.158	0.096	0.018	0.106	No
H9	SE-> BI	0.252	0.254	0.094	0.082	0.008	Yes
H10	SE -> UB	0.251	0.236	0.098	0.007	0.010	Yes
H11	BI -> UB	0.785	0.786	0.055	1.581	0.000	Yes
H13	ICT skills x BI -> UB	0.072	0.067	0.037	0.033	0.049	Yes
H14	AP x BI -> UB	-0.094	-0.092	0.037	0.048	0.010	Yes

The remaining P values in the other hypotheses in Table 4 were less than .05; thus, H_1, H_2, H_4, H_7, H_9, H_{10}, H_{11}, H_{13}, and H_{14} were accepted. Among the significant relationships, the path coefficients in the original sample column show that BI affected UB the most (78.5%), followed by PE on BI (43.9%) and PE on SE (36.1%). The other pairs also had positive relationships, except for the moderation effect of AP on the relationship between BI and UB, which was negative. The positive relation means that the positive change in an exogenous construct is most likely to cause the corresponding change in its endogenous one, whereas the negative relation hints that the increase in an exogenous construct will probably entail a decrease in its corresponding endogenous one.

For GD, the authors performed a multigroup analysis via PLS–SEM. The male and female difference in the coefficient of determination was .338, but the P value was .309, surpassing the acceptable level of .05 or lower (Hair et al., 2017). This means that GD did not affect the relationship between BI and UB. Therefore, H_{12} was rejected, and GD was concurrently excluded from the calculation.

The final step is to examine the f-squared (f^2). Hair et al. (2017) suggested that the indices of .02, 0.15, and .35 indicate that an exogenous construct has small, medium, and large effects, respectively, on its corresponding endogenous construct. The f^2 values in Table 4 reveal that the effect of BI on UB was the greatest (1.584). The normal index of f^2 ranged from zero to one; however, because the effect SE on UB was too small (.007, which is close to zero), the value of f^2 of BI on UB, which depended on the inclusion and exclusion of SE, exceeded one. Next is PE, which has a medium effect on BI and SE. Finally, the other significant relationships between EE and SE, FC and BI, and SE and BI were treated as small. Notably, the f^2 values of SE and UB were too small, suggesting that SE had very little effect on BI. Moreover, the moderation effects of ICT skills (.033) and AP (.048) on the relationship between BI and UB were also small.

In conclusion, the assessment of the measurement model revealed that all the indicators and

constructs met acceptable levels of validity and reliability; thus, all the indicators were retained. Moreover, examination of the structural models revealed that some relationships (EE and BI, SI and BI, SI, and SE, and FC and SE) were not statistically significant; as a result, the hypotheses about them were rejected. The analytical results above also support the applicability of Venkatesh et al.'s UTAUT2 (2013) in the BL context for English writing, and in combination with Bandura's SCLT (2002), UTAUT2 has helped to predict EFL students' acceptance of BL successfully.

Discussion

Data analysis provides a new understanding of the factors that impact students' acceptance of BL for English writing, and the major findings are discussed below.

First, *BI has the main impact on students' acceptance of BL for English writing*, although both SE and BI positively influence UB. Figure 3 indicates that SE and BI explained 82.6% of the variance in UB, whereas Table 2 shows that while BI impacted UB by 78.5%, SE influenced UB by 25.1%. This information indicates that students' intention to use BL is predetermined by their attitude toward using it. This finding partly coincides with both Norman (2022) and Azizi et al. (2020), who estimated user acceptance of BL for their learning needs, and Venkatesh et al. (2003), who estimated user acceptance of technology in general. Therefore, if stakeholders wish to increase students' use of BL, they must find ways to increase their intention to use BL first and foremost. In reference to the definition of BI, this involves students' preference for BL, awareness of BL effectiveness and activity abundance, and willingness to use it for English writing. When students are fully aware of the benefits of BL and their self-efficacy in using BL for writing, they are more likely to incorporate BL into their academic life.

Second, *SE is a new construct that works exogenously and endogenously to affect students' acceptance of BL for English writing*. Table 4 indicates that SE influenced BI and UB mostly equally. In particular, SE positively impacted BI by 25.2% and UB by 25.1%. This finding is somewhat similar to that of Li et al. (2020), who reported that SE directly affects students' acceptance of BL for their academic needs by 35.5%, whereas SE works solely as an exogenous construct to affect UB directly. In addition, Table 4 shows that SE was affected by EE and PE by 28.3% and 36.1%, respectively, indicating that SE works as a mediating construct influencing students' acceptance of BL.

Although the direct effect of SE on UB is not large, the increase in students' self-efficacy in using BL for writing will probably entail an increase in their behavioral intention and use of BL for English writing. As a result, when teaching English writing in a BL course, teachers should train their students to exploit this model to increase their confidence. The more confidence they feel in using BL, the more positive attitudes they hold toward BL, and the more they exploit it for their learning. In short, students' attitudes toward and intentions to accept BL are impacted by their confidence in its use.

Third, *PE is the most influential environmental factor that affects students' SE and BI*. Compared with those of EE or FC, the coefficients of determination in Table 2 reveal that PE positively affected BI by 43.9% and SE by 36.1%. In most previous studies on students' use of technology (Nguyen & Chu, 2021; Venkatesh et al., 2003) or their use of BL for their academic needs (i.e., Azizi et al. 2020; Dakduk et al., 2018; Norman, 2022), PE was reported to moderately or substantially influence BI. Because PE was defined as being useful for their writing in terms of enjoyment, enhanced activities, and improved performance, those variables actually contribute to forming students' attitudes and confidence in adopting BL. As a

consequence, when applying BL to teach English writing, the teacher should help their students be aware of the benefits of that model. When perceiving the usefulness of BL in learning to write English, they are likely to accept it.

Fourth, *PE is likely to increase students' belief, whereas FC can improve their attitude.* In particular, PE positively impacted SE, as shown in Table 4. This means that when students feel that BL is useful, their self-efficacy in using BL for writing is likely to increase. As a result, how students perceive BL affects their beliefs. In addition, FC did not positively affect SE but rather BI, as presented in Table 4, suggesting that the assistance that the university provides for students is unlikely to enhance their confidence in BL but rather encourages them to use BL. In summary, EE and FC are important in affecting students' acceptance of BL for writing in terms of increasing their beliefs and attitudes. This finding indicates that when being exposed to the optimal conditions of BL, students will change their attitudes and confidence in learning to write English in that model. The jobs of stakeholders should then involve equipping appropriate tools and technology for BL to be well applied if they wish to promote this model of learning.

Fifth, ICT skills and AP are the newly identified constructs that moderate students' acceptance of BL such that *students with more ICT skills deploy BL more, whereas those with greater academic achievement use BL*. As presented in Table 4, ICT skills had a small positive effect on the relationship between BI and UB, meaning that improved ICT skills can enhance students' use of BL for English writing. Although Table 4 indicates a small effect size (.033), the systems information reveals that when students are better at using ICT, they will probably favor BL for their English writing. In contrast, AP negatively impacted the relationship between BI and UB, indicating that those good at English writing do not intend to use BL for English writing. It can thus be inferred that weaker students prefer to use BL more than better students do. Overall, ICT skills and AP play moderating roles in impacting students' acceptance of BL for writing.

Finally, the rejections of H_5 and H_6 (Table 4) reveal that SI has a statistically insignificant relationship with SE or BI, indicating that SI is not a direct determinant of students' beliefs or attitudes toward using BL for English writing. This finding is quite similar to that of Dakduk et al. (2018) but conflicts with those of Norman (2022), Azizi et al. (2020), and Li et al. (2022), who employed UTAUT2 to estimate students' use of BL for their academic purpose. The difference in the effects of SI on BI and SE might be due to the specialized BL context of English writing or because students are skilled at using ICT (Ho, 2024), their attitudes and confidence in adopting BL do not depend on the surrounding environment. Theoretically, SI is relevant to what occurs in the classroom, such as the university where they study, their teacher, peers, and the learning environment. In addition, the rejections of H_3 and H_8 indicate that EE and FC were not predictors of SE. While FC is associated with ICT, EE refers to its ease of use. The exclusion of those two constructs from the hypothesized research model might have resulted from the fact that the ICT provided by the university where this study was conducted was modern and user friendly; therefore, the students did not encounter any difficulty using it. In contrast, they felt confident and had positive attitudes toward ICT and BL, and their perceptions of the causal relationships between FC and EE and SE became blurred. As a result, when stakeholders provide good and easy-to-use technology for students to learn in a BL model, they naturally like and become confident in using it.

Conclusion

The authors successfully applied Venkatesh et al.'s UTAUT2 in combination with Bandura's SCLT to understand students' acceptance of BL for English writing. The statistical results also revealed two new moderating constructs (ICT skills and AP) and four new exogenous and endogenous relationships via SE positionality. By understanding the systems information in the newly validated research model, stakeholders will understand what needs to be done methodologically to enhance EFL students' use of BL for writing and, ultimately, to improve their learning results.

Regarding the limitations of the present study, because the findings are purely exploratory, they are context-bound, participant-bound, and situation-bound (Creswell & Creswell, 2018). As a result, applicability is left to subsequent researchers or practitioners to examine the similarities between the two study contexts. In addition, the replicability of the research design is essential to collect further empirical evidence to increase the generalizability of the findings.

For future researchers, several different models of BLs exist, and the present study focused only on a station rotation model. To gain a more comprehensive understanding of BL in general, subsequent studies should target other BL models (i.e., lab rotation, flipped classroom) and replicate this study's design to explore them.

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