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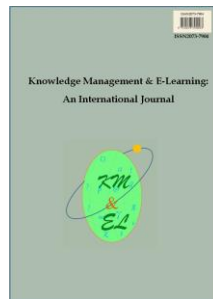
**Applying technology acceptance model to Gauge University students' perceptions of using blackboard in learning academic writing**

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## **Applying technology acceptance model to Gauge University students' perceptions of using blackboard in learning academic writing**

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**Abstract:** Many higher educational institutions have adopted Learning Management Systems. Blackboard, characterized as one of the technological educational systems, is one of the leading and extensive Learning Management Systems adopted by most universities. However, literature showed that a missing link appears between Blackboard adoption and Blackboard poor usage in teaching and learning. Therefore, this study aims to gauge the perceptions of students toward using Blackboard Collaborate in learning English as a Foreign Language academic writing. Online survey was conducted and distributed to 248 respondents. This study is quantitative in nature, employing Technology Acceptance Model theory to check Learning Management System acceptance at Saudi Electronic University in Saudi Arabia. The findings showed that all the constructs were relatively strong and had positive relationships; they were correlated with each other and the whole six hypotheses were supported as well. In this paper, the proposed model indicates that Attitude toward Use is the strongest predictor of Behaviour Intention. This study offers implications for further studies.

**Keywords:** Blackboard; EFL academic writing; EFL students; Perceptions; Technology acceptance model (TAM)

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## 1. Introduction

Learning Online learning environment is increasing dramatically among universities all over the world. Higher education institutions ceaselessly adopt online trends of instruction (Weldon, Ma, Ho, & Li, 2021). The use of technology changes a large number of traditional methods to the purpose of moving these institutions toward success and prosperity. To have a clear image regarding the future of the institution, a plan that implements the change should be effectively developed by those who are working in these institutions (Lick, 2001). In addition, based on recent reports, Leeds et al. (2013) pointed out that learners' retention is deeply correlated with engaging and innovative online activities as well as course design. Thus, technology is significantly being used by both the instructors and the students to boost student engagement and participation in classes and student outcomes. In fact, the use of technology has its reputation and position in literature to increasingly deliver online courses (Bower, Kenney, Dalgarno, Lee, & Kennedy, 2014; Keržič, Danko, Zorko, & Dečman, 2021).

Large numbers of technological applications encourage the educational process in higher education institutions. Such use of technology changes these higher educational institutions from a traditional learning environment to a technological one on the basis of interaction and stimulating creativity. Additionally, it should be noted that Mohsen and Shafeeq (2014) pointed out that Learning Management Systems '[have] been adopted by many institutions due to [their] ubiquity, easiness, and accessibility'" (p. 108). Given that Blackboard is one of the leading and extensive Learning Management Systems (LMS) adopted by universities (Chang, 2008), it is defined as "software package designed to help educators create quality online courses" (Choy, Xiao, & Iliff, 2005, p. 130).

The Blackboard system is extensively popular among higher institutions around the world. Its system has several qualities supporting teaching and learning process (Al-Naibi, Madarsha, & Ismail, 2015). Al-Naibi et al. (2015) confirmed that one of these qualities involves the issue that the Blackboard system is able to enhance the interaction among students as well as their instructors. This particular system also offers considerable opportunities to let students engage in learning outside the classroom environment at any required time (D'silva & Reeder, 2005), utilizing several different tools presented to the students in order to have an interaction and access to the course contents. Thus, the Blackboard is regarded as a noticeable platform that helps in blended learning, which is a combination of on-line resources and traditional method (face-to-face), providing sharing content and effective communication. Such kind of technology becomes one of the most educational systems adopted around the world and particularly in some Saudi Universities (Zaki & El Zawaidy, 2014).

Regarding blended learning, findings of research studies demonstrated how the blended teaching in education is effective through various aspects. Such aspects involve verbal communication and motivation to e-learning, the improvement of the level of academic achievement, persistence of learning influence, interaction among learners, research skills, adjusting alternatives conceptions, and improving comprehension (Al-Kandri, 2013; Sawafta & Al-Garewai, 2016).

Thus, the Blackboard briefly contains useful tools to control courses' content in a dramatic manner. This system enables the lectures to coin electronic interactive courses

and manage tasks, including assignments, course outline, discussion forums, sending and receiving emails and announcements to students, and making tests and scores. Moreover, it helps the instructors divide the class into groups, allowing immediate live chat which is run by the lecturers (Schier & Shields, 2009). Hence, a change towards the instructional practices offered by the use of Blackboard Learning Management System is highly recommended as a way to creatively provide and gain knowledge as well as offering various opportunities to students to improve their academic writing proficiency. Also, one should not forget that the function of Blackboard Collaborate technology is to help students work and learn in a collaborative online environment.

It should be noted that the focus of prior research was mainly on areas such as the business, engineering, and sciences (Zhu, 2004). Such areas are likely considered to be attracted to the largest numbers of foreign students. However, little research, particularly in the EFL context, concentrate on how students cultivate their academic literacy and get access to a certain discourse community when doing their writing tasks through using the technology of computer-mediated communication (CMC) environment. For example, Fageeh and Mekheimer (2013) pointed out that there is lack of research concerning the role of CMC in helping students engage in academic writing process.

Furthermore, a missing connection exists between the adoption of Blackboard and its weak utilization in learning and teaching process (Nichols, 2011; Schoepp 2005; Sneller, 2004). Another challenge is that English majors' writing is poor in writing classes (Kassem, 2018). This result has been emphasized by low scores recorded in standardized writing exams. This poor writing performance is probably due to the current teaching practices in a manner that students are not provided with sufficient opportunity to practice the skill of writing in order to enhance the quality of their writings (Kassem, 2018). Therefore, there must be a change towards the instructional practices offered by the use of Blackboard Learning Management System. Additionally, little research has been conducted to assess the effect of a LMS on technological programs relevant to learning outcomes of university students (Ismail & Salih, 2018). Hence, the current study is intended to measure student' perceptions of using Blackboard Collaborate in learning EFL academic writing at Saudi Electronic University (SEU) through applying Technology Acceptance Model (TAM).

## **2. Literature review**

Working with very large number of institutions all over the world, LMS helps these institutions overcome their educational challenges. It also helps them run innovation in education. Therefore, it is advisable to train learners how to utilize such kinds of technology before using them for learning purposes since online learning coins more opportunities than the traditional learning. Students are able to select their own time to launch an environmental learning process. It is interesting to indicate that online learning boosts learners' access to courses by using certain activities, featuring as having flexible schedules influencing learners' learning (Lim, 2004).

Gautreau (2011, p.2) defined a LMS as "a self-contained webpage with embedded instructional tools that permit faculty to organize academic content and engage students in their learning". A LMS is a software platform designed on the web aiming to assure effective management and distribution of learning materials to participants and users (Govender & Govender, 2012). Cavus, Uzunboylu, and Ibrahim (2007, p.302) pointed out that "an LMS has recently become a very active domain among researchers studying online education" and an LMS system "acts like a bridge between the instructors and

learners”. It is important to note that LMS involves Blackboard, Brightspace, and Moodle. These are very common technologies cultivated to encourage the application of learning processes and distance teaching and learning (McGill, Klobas, & Renzi, 2011). Furthermore, implementing learning activities helped students master their learning experience and trying more required skills. It is crucial that the incorporation of LMS such as Blackboard and Moodle helped students collaborate and practice their learning experience concerning topics (Ismail & Salih, 2018) such as speech writing (Lata & Luhach, 2014).

All in all, involving technologies and computers and providing various learning instruments, a LMS offers a virtual method of speedy communication and accommodation as well as allowing efficacy in processes of instructional teaching and learning (Fathema, Shannon, & Ross, 2015). With respect to this research, LMS (Blackboard) described as an electronic learning platform has been investigated since it is utilized at the university from which the participants form the sample of this study.

In the context of Saudi Arabia, many studies have been conducted to examine students’ perceptions and attitudes toward the use of Blackboard as one of the Learning Management Systems at the level of universities. For example, Alqurashi (2005) examined students’ attitude toward blackboard use for collaboration learning regarding composition courses. The researcher made a comparison between students who experienced face to face learning and others who experienced web-based learning using the blackboard software. The findings did not reveal significant differences between the group who experienced the face-to-face learning and the other group who experienced the web-based learning. An explanation to such result can be related to three possible reasons. They are probably due to the low reliability of one of the measures adopted in the survey, technical obstacles, and the collaborative learning characterized as being a new technique.

Furthermore, in some Saudi universities, instructors’ attitudes towards the use of E-learning Management System, JUSUR, cultivated by National Center for E-learning have been investigated (Hussein, 2011; Alturki, Aldraiweesh, & Kinshuk, 2016). Hussein’s (2011) findings showed no significant difference in instructors’ attitudes towards implementing JUSUR, whereas Alturki et al. (2016) concluded that instructors from different colleges can have the access as well as the Blackboard LMS usage. Similarly, Hussein (2016) investigated the perceptions of female students at the University of Hail regarding the effectiveness, usability, accessibility of using Blackboard in web-enhanced listening and speaking course. The results of her study showed that students had positive attitudes towards the use of Blackboard in general. Their positive attitude is particularly that female students found such educational technology supportive in enhancing their language skills as well as the student-teacher communication. Similarly, in the University of Bisha in Saudi Arabia, Ja’ashan (2015) conducted a case study analyzing EFL students’ attitudes and perceptions towards Blended Learning course in English. The findings showed positive attitudes of students towards Blended Learning and more responsibility should be taken into consideration by students for the sake of their learning process. The same study revealed the effectiveness of the Learning Management System used in Blended Learning along with face-to-face learning techniques in order to improve and develop skills and knowledge.

In another study conducted at the Arabian Gulf University, Ismail and Salih (2018) explored the manner how Blackboard (LMS) incorporated and used for enhancing the outcomes of a blended learning-based research methods course. The results revealed the use of Blackboard confirmed the easiness of research methods course learning. Using

blackboard also improved students' learning outcomes along with their satisfaction with the learning experience.

In contrast, Goh, Hong, and Gunawan (2014) examined the lecturers' perception regarding the use of LMS with respect to perceived ease of use and perceived usefulness for teaching purposes. In order to design the questionnaire, Technology Acceptance Model (TAM) was used as the research framework. The findings demonstrated that lecturers show no positive reaction towards perceived ease of use of Moodle for teaching. The results also showed that interaction, communication issues, and usability issues negatively affect the perception of the lecturers.

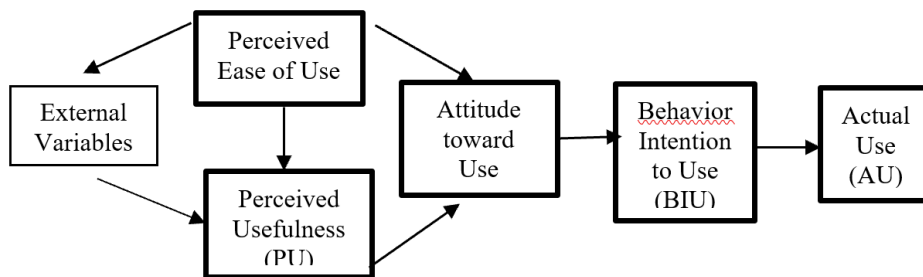
Additionally, Schmidt (2002) conducted a study to investigate students' perception and learning outcomes of online teaching versus classroom teaching. The participants were 29 students who were randomly assigned to two groups, namely Group A and Group B. Group A took courses using the traditional classroom method, whereas Group B took courses using an online learning method. In conclusion, the study identified no significant differences in learning outcomes; this means that both groups had the same outcome. It is interesting to note that group B enjoyed working from home and at their convenience time. In a nutshell, the previous studies did not investigate students' perceptions of utilizing Blackboard Collaborate in learning EFL academic writing through applying Technology Acceptance Model theory.

### *2.1. Theoretical framework*

Based on the theory of reasoned action (TRA) introduced by Fishbein and Ajzen (1975), Davis (1989) designed the Technology Acceptance Model (TAM). TAM is one of the models used widely in the field of construing the acceptance of technologies. It is important to note that TAM has been used in several empirical studies (Al-Busaidi & Al-Shihi, 2010; Shroff, Deneen, & Ng, 2011; Yoon, 2016; Mohammadi, 2015). TAM model includes any probable external variable that has the ability to influence Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) to define the Attitude (A) of human behavior intention (BI) to the use of IT application (AU). Fig. 1 shows the model of Technology Acceptance Model (TAM). It is interesting to indicate that the way TAM works is as follows: the acceptance of new technologies can be estimated through evaluating 5 determinants, namely perceived usefulness (PU), perceived ease of use (PEOU), attitude toward use (ATU), behavioral intention to use (BIU) and actual use (AU). PU refers to the extent to which someone thinks that utilizing the system would boost his or her performance (Davis, 1989). PEOU indicates the extent to which someone thinks that utilizing the system will not be difficult to be free of efforts of cognition (Davis, 1989). Holden and Rada (2011) argued that TAM offers cognitive, affective and behavioral responses of users toward systems and technologies. To be more specific, PEOU and PU describe cognitive efforts, whereas ATU describes affective responses and BIU describes users' behavioral responses.

Much research exploring technology acceptance has indicated that TAM has the ability of prediction and explanation for the reason entailing users to prefer to use the information systems in different disciplines. It should be noted that TAM is broadly used in information system research due to its simplicity and understandability (Sumak, Hericko, Pusnik, & Polancié, 2011). Furthermore, it is interesting to note that TAM has been used in e-commerce setting to investigate when PEOU influences IT adoption (Gefen & Straub, 2000). In the latter research, the findings showed that TAM can be perfectly applied to business to commerce as well as business to business systems. TAM has been also used in investigating the acceptance of telemedicine technology among

physicians. Therefore, TAM is relevant as an intention-based model to interpret and forecast the user acceptance of computer technology (Hu, Chau, Sheng, & Tam, 1999). TAM has become a pivotal theoretical instrument for ICT in education research fields. For example, research affirmed that TAM has been extensively able to predict technology acceptance in higher education settings via demonstrating ten previous research that utilized TAM as a theoretical framework (Venter, Van Rensburg, & Davis, 2012). In addition, Nair and Das (2011) stressed that TAM is a robust model; it is very successful in assessing technology acceptance and predicting actual usage of IT tools in learning and teaching.

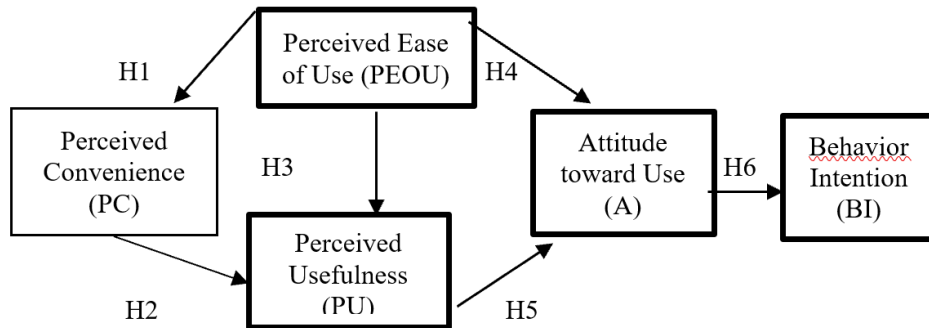


**Fig. 1.** Technology Acceptance Model (TAM), adapted from Davis (1989)

It should be noted that a number of studies tried to employ TAM in IT context showed that TAM has successfully been affected in describing the human behavior in a way that accepts the existence of particular IT application with reference to previous studies concerning the acceptance of hardware (Hossain & Prybutok, 2008). As for specific e-learning acceptance field, research asserted that TAM has been effectively utilized by offering some antecedent factors. For instance, Sánchez and Hueros (2010) adapted TAM in their research. The researchers tested the two extra factors to gauge Moodle that is a well-known open source e-learning system. One of the proposed factors was omitted from their model. The findings of their study showed that 41% of real situation could be explained by the proposed model. It is interesting to note that Perceived Ease of Use was recognized as a key element of their model. Other e-learning researchers also confirmed the convenience of implementing TAM (Escobar-Rodriguez & Monge-Lozano, 2012). Based on the aforementioned research, TAM can be implemented to be employed as a theoretical framework and to build the current research survey which is the measurement model for Blackboard Learning Management System. Therefore, this study utilized TAM as an analysis model adopted from Ahmed (2016) to gauge students' perception of the English language department toward using Blackboard Collaborate in learning EFL academic writing.

Thus, the current study tries to answer the following question: Is there a relationship among students' perceptions of using Blackboard in learning EFL academic writing in terms of Perceived Convenience, Perceived Ease of Use, Perceived Usefulness, Attitude toward Use, and Behavioral Intention?

It also provides the research model and hypotheses. It is crucial to note that this model is an extension of the TAM. Its proposition was based on related studies and theories (Ahmed, 2016) as illustrated in Fig. 2. This figure demonstrates that TAM consists of five factors; these include Perceived Convenience (PC), Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude toward Use (A), and Behavior Intention (BI).



**Fig. 2.** Extended Technology Acceptance Model, adapted from Ahmed (2016)

It is worth mentioning that perceived convenience (PC) is utilized as an extra factor as two types of convenience exist, which are product and service. Berry, Seiders, and Grewal (2002) stated that a method that identifies whether a product or service to be convenient relies on effort and time. A product or service convenience was investigated through five factors involving time, use, place, execution and acquisition (Brown, 1990). It is interesting to notice that perceived convenience was defined as a type of convenience pertaining to place, time, and execution that an individual feels when adopting the system to reach task accomplishment (Yoon & Kim, 2007). In the current study and on the basis of Yoon and Kim's (2007) views, perceived convenience has been identified defined as a type of convenience pertaining to place, time, and execution that one perceives at the time of blackboard learning management system participation.

It is interesting to consider that time convenience represents an aspect of convenience relating to time an individual perceives when attaining task performance in Blackboard LMS. It is also crucial to indicate that Yoon and Kim (2007) revealed that PEOU influenced PC positively, and PC positively influenced PU. On the contrary, Hossain and Prybutok's (2008) findings were opposed to Yoon and Kim's (2007) findings. In their study, Hossain and Prybutok (2008) posited that convenience involved usefulness and ease of use. Hence, further investigation of the relationships between perceived convenience and TAM variables are required.

According to Fig. 2, six hypotheses were posited to gauge the acceptance of LMS from Saudi students' perceptions of using Blackboard in learning EFL academic writing in terms of Perceived Convenience, Perceived Ease of Use, Perceived Usefulness, Attitude toward Use, and Behavioral Intention. In order to test the effect of TAM constructs, the six hypotheses were as follows:

- H1:** Students' PC positively affects their PEOU
- H2:** Students' PC positively affects their PU
- H3:** Students' PEOU positively affects their PU
- H4:** Students' PEOU positively affects their ATU
- H5:** Students' PU positively affects their ATU
- H6:** Students' ATU positively affects their BI



### **3. Methods**

#### *3.1. Research methodology, data collection, and the sample*

This research used quantitative method since it is appropriate for analyzing TAM based on TAM theory (Binyamin, Rutter, & Smith, 2017; Ahmed, 2016). Fraenkel, Wallen, and Hyun (2011) pointed out that a quantitative study enables scholars to construct a generalization about a certain population when data collection from a representative sample are conducted. Because of its accessibility to various devices and its easiness (Fraenkel et al., 2011), this paper employed an online survey for collecting data (Alharbi & Drew, 2014; Mailizar, Burg, & Maulina, 2021). Online surveys mainly rely on the Internet for collecting data as they offer several advantages to most researchers (Wright, 2005). In order to gauge students' perceptions of using Blackboard in learning English writing academy at SEU, online questionnaire adopted from Ahmed (2016) was used in this study. It is important to notice that since its inception the researchers adopts Blackboard collaborate System and all students are well-aquainted with the continuous use of Blackboard and the Internet at SEU. It is interesting that participants of this study were taught the course of Academic Writing. In their virtual classrooms, Blackboard is used as a computer-mediated communication. This environment is utilized for teaching and learning academic writing and enhancing students' perspectives toward the skill of writing in an academic manner. Students' interactions in such environment are presented in two forms of collaborative online strategies. The first kind is the synchronous chat and the other is the asynchronous discussion boards pertaining to learners' academic writing skills.

The participants of this study involved male and female undergraduate students majoring in English language and translation at SEU and their total number has been approximately 700. It should be noted that the responses of online survey were 317. Hence, the sample of this study involved 248 male and female students selected on the basis of Krejcie and Morgan's (1970) sample size determination. The online questionnaire was distributed from February to April 2020.

#### *3.2. Instrumentation*

The instrument of this research involved 2 sections. The first section asked about demographic information of the participants. It included students' academic status, occupation status, and gender. The second section involved twenty-two items to gauge 5 constructs represented by Perceived Convenience (PC), Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude (A), and Behavior Intention (BI). These 18 items were used to gauge a five-point Likert- scale, ranging from 1 "Strongly Disagree" to 5 "Strongly Agree". The constructs included PC (4 items), PEOU (3 items), PU (5 items), ATU (3 items) and BI (3 items). To ensure the validity and reliability of the instrument, the 18 items were adopted from Ahmed's (2016) study that provided a good level of reliability that ranged from 0.971 to 0.764.

#### *3.3. Data analysis*

After data collection process, the responses were calculated using Partial Least Squares Structural Equation Modelling (PLS-SEM) approach. PLS-SEM is relevant for the purpose of this paper. SmartPLS 3 was utilized to check the measurement and structural model of this paper (Ringle, Wende, & Becker, 2015). Structural equation modelling

(SEM) to was used to test the proposed hypotheses. In order to examine the factor analysis and confirm the reliability, validity, and internal consistency of the proposed model (Mailizar et al., 2021), SMART PLS 3.0 was used.

#### 4. Findings

The findings of the current study encompass demographic information, descriptive statistics, reliability of the instrument, as well as the findings of factor analysis and proposed hypotheses testing.

##### 4.1. Demographic information

The demographic information of the participants is presented in Table 1. The participants are composed of 81 male (32.7%) and 167 female (67.3) students. Based on the Student's Academic Status, the majority of the respondents (66.9%) are considered to be within the status of freshman year. There are 59 juniors (23.8%) and 23 seniors (9.3%). As for the occupation status, most of the respondents (71.8%) have no current job and they have full time to study, whereas the other students (28.2%) have their own jobs.

**Table 1**

Demographic information of the participants

Item	Frequency	Percentage
Student's Academic Status		
Freshman (level 3&4)	166	66.9%
Junior (level 5&6)	59	23.8%
Senior (level 7&8)	23	9.3%
Total	248	100%
Occupation Status		
Working	70	28.2%
Full- time student	178	71.8%
Total	248	100%
Gender		
Male	81	32.7%
Female	167	67.3%
Total	248	100%

##### 4.2. Descriptive statistics

The descriptive analysis of the participants' responses pertaining to 18 items is illustrated in Table 2. It is critical to indicate that the whole mean values are above 3.27. This result proves the positive assessments for LMS gained by the participants' responses. The values of the standard deviation lie within the range of .951 and 1.305. This result also shows that the data is close to the mean.

In order to assess the reliability of TAM, Cornbach Alpha is frequently employed to gauge the reliability assessment (Al-Busaidi & Al-Shihi, 2010; Orfanou, Tselios, & Katsanos, 2015). Reliability is concerned with the internal consistency among various constructs or variables to gain similar results under same conditions (Field, 2013). It is important to note that reliability assessment (i.e., achieving internal consistency) can be

attained when the value of Cronbach’s Alpha goes past 0.70 (Sekaran & Bougie, 2013). The internal consistency of TAM enjoys a considerable reputation in literature. For instance, the values of Cronbach’s alpha ranged between 0.718 and 0.858 in Ma, Chao, and Cheng’s (2013) study, between 0.801 and 0.924 in Alharbi and Drew’s (2014) study and they ranged from 0.904 to 0.914 in Shroff et al’s (2011) study. Hence, the current study deployed Cronbach’s alpha to assess the internal consistency of TAM. It has been found that all assessments display a high level of reliability; they ranged from 0.894 to 0.820 as demonstrated in Table 3. All measures went past 0.70, and this indicates that the questionnaire is regarded as reliable (Hair, Black, Babin, Anderson, & Tatham, 2014; Sekaran & Bougie, 2013). As for validity assessment, the Average Variance Extracted (AVE) of all constructs reports more than 0.5 as recommended by Hair et al. (2014) and therefore, convergent validity has been created.

**Table 2**  
Descriptive statistics and reliability check of TAM

Construct	Measure	Mean	SD
Perceived convenience (PC)	Q1. I can complete Academic writing course activities anyplace with the use of a Blackboard collaborate tool.	3.83	1.157
	Q2. Using a Blackboard collaborate tool gives me convenience in performing my course activities.	3.78	1.028
	Q3. I find Blackboard collaborate tool convenient for my extra Academic writing course activities.	3.68	1.120
	Q4. Using Blackboard collaborate tool enables me to accomplish my Academic writing assignments at a time that is convenient for me.	3.75	1.082
Perceived Ease of Use (PEOU)	Q5. I feel that my interaction with Blackboard collaborate tool is clear and understandable.	3.89	.965
	Q6. I would find Blackboard collaborate tool to be flexible to interact with.	3.79	1.201
	Q7. It would be easy for me to get Blackboard collaborate tool to facilitate my Academic Writing course.	3.64	1.147
Perceived Usefulness (PU)	Q8. Using Blackboard collaborate tool in my Academic Writing course would enable me to accomplish tasks more quickly.	3.80	1.145
	Q9. Using Blackboard collaborate tool would improve my academic writing skills.	3.67	1.081
	Q10. Using Blackboard collaborate tool in my academic writing course would increase my chances to write.	3.73	1.136
	Q11. Using Blackboard collaborate tool would enhance my effectiveness concerning English activities and assignments.	3.71	.0951
	Q12. I would find Blackboard collaborate tool useful and supportive in my Academic Writing course.	3.71	1.104
Attitude Toward Use (ATU)	Q13. I believe it is a good idea to use a Blackboard collaborate tool in learning Academic Writing.	3.67	1.110
	Q14. I like the idea of using a Blackboard Collaborate	3.27	1.305

	tool rather than attending face to face classes in doing Academic Writing course activities.		
	Q15. Using a Blackboard collaborate tool is a positive idea.	3.74	1.102
Behavioral Intention (BI)	Q16. I plan to use a Blackboard collaborate tool in the future.	3.79	1.059
	Q17. Assuming that I have access to Blackboard collaborate tool, I intend to use it.	3.62	1.023
	Q18. Blackboard collaborate tool helps me to be able to apply what I have learned in the future.	3.74	1.091

**Table 3**  
Reliability and convergent validity

Construct	Composite reliability	Cronbach's alpha( $\alpha$ )	Average variance extracted (AVE)	Indicator	Loadings
Perceived Convenience	0.926	0.894	0.759	Q1	0.880
				Q2	0.919
				Q3	0.895
				Q4	0.786
Perceived Ease of Use	0.903	0.840	0.757	Q5	0.875
				Q6	0.888
				Q7	0.847
Perceived Usefulness	0.912	0.879	0.674	Q8	0.801
				Q9	0.822
				Q10	0.787
				Q11	0.881
				Q12	0.811
Attitude Toward Use	0.918	0.865	0.789	Q13	0.901
				Q14	0.834
				Q15	0.926
Behavioral Intention	0.893	0.820	0.735	Q16	0.855
				Q17	0.839
				Q18	0.877

It should be noted that Table 4 shows that every construct had sufficient discriminant validity for PC (0.759), PEOU (0.757), PU (0.674), ATU (0.789), and BI (0.735). Interestingly, Fornell and Larcker (1981) recommended values greater than 0.50.

**Table 4**  
Discriminant validity: Fornell-Larcker criterion

Construct	Perceived Convenience	Perceived Ease of Use	Perceived Usefulness	Attitude Toward Use	Behavioral Intention
Perceived Convenience	0.759				
Perceived Ease of Use	0.504	0.757			
Perceived Usefulness	0.446	0.487	0.674		
Attitude Toward Use	0.525	0.574	0.535	0.789	
Behavioral Intention	0.533	0.731	0.614	0.698	0.735

Note. Squared correlations; AVE in the diagonal.

4.3. Factor analysis

To measure factor analysis, six constructs have been identified. These include PC, PEOU, PU, BI, ATU, and BI. The structural model and its path coefficients were described in Fig. 3. To test the predictive accuracy of the model,  $R^2$  values were determined. Smart PLS administers the squared multiple correlations ( $R^2$ ) for each construct in the model and the path coefficients. It is crucial that  $R^2$  described a construct’s variance percentage, whereas the path coefficients described the strengths of relationships between constructs (Chin, 1998).

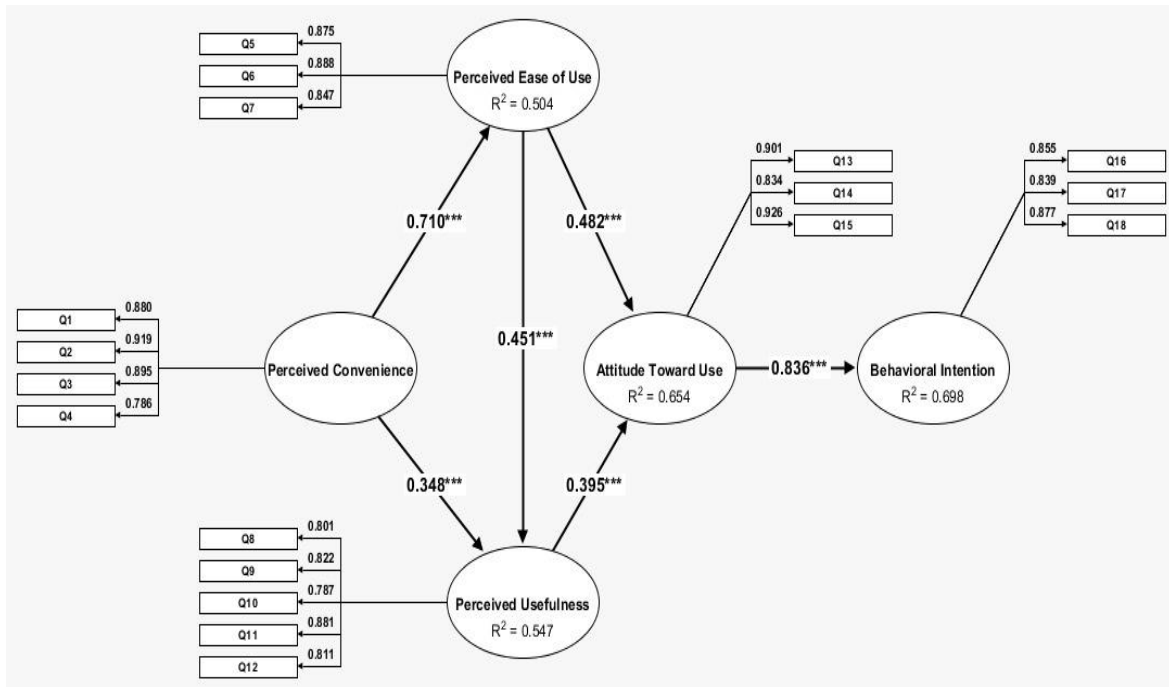


Fig. 3. Structural model and path coefficients

Fig. 3 demonstrates the findings of PLS model. It displays the variance  $R^2$  in the individual constructs and the path coefficients ( $\beta$ ). The whole beta coefficients are

positive and statistically significant at  $p < 0.05$ . Furthermore, this model indicates that ATU is the strongest predictor of BI ( $\beta = 0.836$ ,  $t = 20.300$ ). PC is another strong predictor of PEOU ( $\beta = 0.710$ ,  $t = 12.313$ ).

#### 4.4. Hypothesis testing

The statistical aim of PLS is to describe significant t-values and high  $R^2$ . This implies the rejection of the null hypothesis that has no effect. To support the hypothesized paths, it is important to note that the t-values as shown in Table 5 need to be significant; it is recommended that the t-values should be above 1.96 or 2.56 for alpha levels of .05 and .01 respectively (Halawi & McCarthy, 2008). In this research, all the variances were relatively strong and had positive relationships, indicating that the entire beta coefficients were statistically significant at  $p < 0.05$ ; the majority of the associations gain a high level of significance. Thus, all investigated constructs are correlated with each other and the whole 6 hypotheses are supported.

**Table 5**

The estimated effect of the proposed model and hypothesis testing

Paths	Original coefficient	Standard error	<i>t</i>	<i>p</i> (2-sided)
Perceived Convenience -> Perceived Usefulness	0.348	0.089	3.916	0.0001
Perceived Convenience -> Perceived Ease of Use	0.710	0.058	12.313	0.0000
Perceived Ease of Use -> Perceived Usefulness	0.451	0.087	5.207	0.0000
Perceived Ease of Use -> Attitude Toward Use	0.482	0.101	4.755	0.0000
Perceived Usefulness -> Attitude Toward Use	0.395	0.088	4.515	0.0000
Attitude Toward Use -> Behavioral Intention	0.836	0.041	20.300	0.0000

## 5. Discussion, implications, and conclusion

The urgent use of modern information communication technology developments paves the way for a considerable education enhancement in academic organization and institutions. Due to the substantial use of LMS technology (e.g., Blackboard) in higher education institutions in Saudi Arabia, the purpose of this study was to measure students' perception of the English language department toward using Blackboard Collaborate in learning EFL academic writing. This study employed TAM as an analysis model to test the proposed hypotheses. The findings presented in Table 5 revealed that the constructs represented by (PEOU, PC, PU, ATU, and BI) are completely correlated with each other. Moreover, the six proposed hypotheses are wholly supported when conducting the path analysis technique. For instance, students' perceptions of BI are affected by ATU which is influenced by students' perceptions of PU and PEOU. Students' perceptions of PC have an effect on students' perceptions of PEOU and PU. These results go in line with the findings of Binyamin et al's (2017) study. Additionally, ATU significantly influenced BI. This result goes in line with Mailizar et al's (2021) study and Kuo and Yen's (2009) findings. As for PC, it is another strong predictor of PEOU. This finding is consistent with the results revealed by Chang, Yan, and Tseng's (2012) study.

The findings also elucidated the acceptance of LMS in one of the Saudi higher education institutions. It is critical to notice that this research contributes to the provision

of another high level of reliability of TAM via adopting Cronbach's alpha scale. Additionally, this study provides some comfortable tendency towards the adoption of LMS technology that is novel to higher education institutions in Saudi Arabia. This inclination probably plays a significant role in students' learning courses required at their universities. Thus, this paper accentuates that an outstanding quality of the e-learning system the university owns is important. The university is also required to maintain a positive attitude of students toward e-learning since it is the strongest predictor of students' use of e-learning.

In short, this research investigated university students' perception of Blackboard usage via the use of TAM. The findings of this study could be used to shed more lights on how these perceptions probably formulate the institutional decision making for the sake of shifting toward technology. This inevitable choice in converting traditional universities into online ones is urgent due to the current pandemic, Corona Virus disease (COVID-19). In addition, this paper provides extra empirical validation of the rigorous TAM model that is considered as a reliable and suitable measure of technology acceptance within educational contexts.

It should be noted that the current study has some limitation concerning the sample including the students majoring in English language and Translation. Other studies may be conducted to extend the sample to involve students from other departments as well as their instructors. Further, determining whether there are significant differences in ATU and BI on one hand and PC and PEOU on the other in different university courses might provide additional support to TAM theory. Since this paper tackles the writing course and the respondents were students at SEU, the scope of this study can be extended to involve other courses and participants from other different higher academic institutions in Saudi Arabia. Another issue is that whether other e-learning platforms like Moodle might provide similar findings since this paper investigated the perceptions of students toward using Blackboard Collaborate in learning EFL academic writing. This could be useful area for further investigation.

### **Author Statement**

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### **References**

Ahmed, A. Y. M. (2016). Using technology acceptance model in understanding

- academics' behavioral intention to use blackboard learning management system. *European Journal of Business and Management*, 8(33), 170–178.
- Al-Busaidi, K. A., & Al-Shihi, H. (2010). Instructors' acceptance of learning management systems: A theoretical framework. *Communications of the IBIMA*, 2010: 862128.
- Al-Kandri, A. (2013). The effectiveness of electronic activities in the achievement and motivation to learning among a sample of Kuwait university students. *Educational Journal*, 28(109), 13–50.
- Al-Naibi, S. A., Madarsha, K. B., & Ismail, N. A. (2015). Blackboard use by faculty members in the colleges of applied sciences in the Sultanate of Oman. *International Journal for Innovation Education and Research*, 3(4), 26–40.
- Alharbi, S., & Drew, S. (2014). Using the technology acceptance model in understanding academics' behavioural intention to use learning management systems. *International Journal of Advanced Computer Science and Applications*, 5(1), 143–155.
- Alqurashi, F. (2005). *Computer supported collaborative learning in composition classrooms in Saudi Arabia*. Doctoral dissertation, Ball State University, USA.
- Alturki, U., Aldraiweesh, A., & Kinshuck, D. (2016). Evaluating the usability and accessibility of LMS “blackboard” at King Saud University. *Contemporary Issues in Education Research*, 9(1), 33–44.
- Berry, L. L., Seiders, K., & Grewal, D. (2002). Understanding service convenience. *Journal of Marketing*, 66(3), 1–17.
- Binyamin, S., Rutter, M., & Smith, S. (2017). The students' acceptance of learning management systems in Saudi Arabia: A case study of King Abdulaziz University. In *Proceedings of 11th Annual International Conference of Technology, Education and Development (INTED)*.
- Bower, M., Kenney, J., Dalgarno, B., Lee, M. J. W., & Kennedy, G. E. (2014). Patterns and principles for blended synchronous learning: Engaging remote and face-to-face learners in rich-media real-time collaborative activities. *Australasian Journal of Educational Technology*, 30(3), 261–272.
- Brown, L. G. (1990). Convenience in services marketing. *Journal of Services Marketing*, 4(1), 53–59.
- Cavus, N., Uzunboylu, H., & Ibrahim, D. (2007). Assessing the success rate of students using a learning management system together with a collaborative tool in web-based teaching of programming languages. *Journal of Educational Computing Research*, 36(3), 301–321.
- Chang, C. C., Yan, C. F., & Tseng, J. S. (2012). Perceived convenience in an extended technology acceptance model: Mobile technology and English learning for college students. *Australasian Journal of Educational Technology*, 28(5), 809–826.
- Chang, C. L. (2008). *Faculty perceptions and utilization of a learning management system in higher education*. Doctoral dissertation. Ohio University, USA.
- Chin, W. W. (1998). Issues and opinions on structural equation modeling. *MIS Quarterly*, 22(1), 7–16.
- Choy, D., Xiao, J., & Iliff, J. (2005). How can technology help improve the quality of blackboard faculty training and encourage faculty to use blackboard? In *2005 Annual Proceedings-Orlando* (Vol. 1, p. 130)
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- D'Silva, R., & Reeder, K. (2005). Factors that influence faculty members' uptake and continued use of course management systems. *British Journal of Educational Technology*, 36(6), 1071–1073.
- Escobar-Rodriguez, T., & Monge-Lozano, P. (2012). The acceptance of Moodle technology by business administration students. *Computers & Education*, 58(4),



1085–1093.

- Fageeh, A., & Mekheimer, M. A. A. (2013). Effects of blackboard on EFL academic writing and attitudes. *JALT CALL Journal*, 9(2), 169–196.
- Fathema, N., Shannon, D., & Ross, M. (2015). Expanding the technology acceptance model (TAM) to examine faculty use of learning management systems (LMSs) in higher education institutions. *MERLOT Journal of Online Learning & Teaching*, 11(2), 210–232.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Sage.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. New York, NY: Addison-Wesley.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2011). *How to design and evaluate research in education*. New York, NY: McGraw-Hill.
- Gautreau, C. (2011). Motivational factors affecting the integration of a learning management system by faculty. *The Journal of Educators Online*, 8(1), 1–25.
- Gefen, D., & Straub, D. (2000). The relative importance of perceived ease of use in IS adoption: A study of e-commerce adoption. *Journal of the Association for Information Systems*, 1: 8.
- Goh, W. W., Hong, J. L., & Gunawan, W. (2014). Exploring lecturers' perceptions of learning management system: An empirical study based on TAM. *International Journal of Engineering Pedagogy*, 4(3), 48–54.
- Govender, I., & Govender, D. W. (2012). A constructivist approach to a programming course: Students' responses to the use of a Learning Management System. *African Journal of Research in MST Education*, 16(2), 238–252.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2014). *Pearson new international edition: Multivariate data analysis* (7th ed.). Pearson Education Limited.
- Halawi, L., & McCarthy, R. (2008). Measuring students perceptions of blackboard using the technology acceptance model: A PLS approach. *Issues in Information Systems*, 9(2), 95–102.
- Holden, H., & Rada, R. (2011). Understanding the influence of perceived usability and technology self-efficacy on teachers' technology acceptance. *Journal of Research on Technology in Education*, 43(4), 343–367.
- Hossain, M. M., & Prybutok, V. R. (2008). Consumer acceptance of RFID technology: An exploratory study. *IEEE Transactions on Engineering Management*, 55(2), 316–328.
- Hu, P. J., Chau, P. Y. K., Sheng, O. R. L., & Tam, K. Y. (1999). Examining the technology acceptance model using physician acceptance of telemedicine technology. *Journal of Management Information Systems*, 16(2), 91–112.
- Hussein, E. T. (2016). The effectiveness of using blackboard in improving the English listening and speaking skills of the female students at the University of Hail. *Advances in Social Sciences Research Journal*, 3(12), 81–93.
- Hussein, H. B. (2011) Attitudes of Saudi universities faculty members towards using learning management system (JUSUR). *The Turkish Online Journal of Educational Technology*, 10(2), 43–53.
- Ismail, A. M. A., & Salih, A. A. (2018). The impact of blackboard LMS on teaching research method course for technology studies graduate students at the Arabian Gulf University. *International Journal of Information and Education Technology*, 8(2), 81–94.

- Ja'ashan, M. M. N. H. (2015). Perceptions and attitudes towards blended learning for English courses: A case study of students at University of Bisha. *English Language Teaching*, 8(9), 40–50.
- Kassem, M. A. M. (2018). The effect of using blackboard on English majors' writing proficiency and attitudes. *International Journal of Applied Linguistics and English Literature*, 7(6), 73–79.
- Keržič, D., Danko, M., Zorko, V., & Dečman, M. (2021). The effect of age on higher education teachers' ICT use. *Knowledge Management & E-Learning*, 13(2), 182–193.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610.
- Kuo, Y. F., & Yen, S. N. (2009). Towards an understanding of the behavioral intention to use 3G mobile value-added services. *Computers in Human Behavior*, 25(1), 103–110.
- Lata, P., & Luhach, S. (2014). An exploratory investigation of online forum mediated collaborative learning of speech writing: A case study. *Journal on English Language Teaching*, 4(1), 18–28.
- Leeds, E., Campbell, S., Baker, H., Radwan, A., Brawley, D., & Crisp, J. (2013). The impact of student retention strategies: An empirical study. *International Journal of Management in Education*, 7(1/2), 22–43.
- Lick, D. W. (2001). Leading change: Creating the future for education technology. *Syllabus*, 15(5), 22–24.
- Lim, D. H. (2004). The effect of flexible learning schedule on online learners' learning, application, and instructional perception. In *Proceedings of the Academy of Human Resource Development International Conference* (pp. 1060–1066).
- Ma, C. M., Chao, C. M., & Cheng, B. W. (2013). Integrating technology acceptance model and task-technology fit into blended e-learning system. *Journal of Applied Sciences*, 13(5), 736–742.
- Mailizar, M., Burg, D., & Maulina, S. (2021). Examining university students' behavioural intention to use e-learning during the COVID-19 pandemic: An extended TAM model. *Education and Information Technologies*. doi: 10.1007/s10639-021-10557-5
- McGill, T., Klobas, J., & Renzi, S. (2011). LMS use and instructor performance: The role of task-technology fit. *International Journal on E-Learning*, 10(1), 43–62.
- Mohammadi, H. (2015). Investigating users' perspectives on e-learning: An integration of TAM and IS success model. *Computers in Human Behavior*, 45, 359–374.
- Mohsen, M. A., & Shafeeq, C. P. (2014). EFL teachers' perceptions on blackboard applications. *English Language Teaching*, 7(11), 108–118.
- Nair, I., & Das, V. M. (2011). Analysis of recent studies undertaken for assessing acceptance of technology among teachers using TAM. *International Journal of Computer Applications*, 32(8), 38–46.
- Nichols, D. L. (2011). *An exploration of blackboard utilization by faculty at a Midwestern University*. Doctoral dissertation, Ohio University, USA.
- Orfanou, K., Tselios, N., & Katsanos, C. (2015). Perceived usability evaluation of learning management systems: Empirical evaluation of the system usability scale. *The International Review of Research in Open and Distributed Learning*, 16(2), 227–246.
- Ringle, C. M., Wende, S., & Becker, J. M. (2015). *SmartPLS 3*. SmartPLS GmbH, Boenningstedt, Germany.
- Sánchez, R. A., & Hueros, A. D. (2010). Motivational factors that influence the acceptance of Moodle using TAM. *Computers in Human Behavior*, 26(6), 1632–1640.
- Sawafta, W., & Al-Garewai, A. (2016). The effectiveness of blended learning, based on learning management system “blackboard” in direct and delayed achievement of physics and learning retention among the students of Health Colleges in King Saud

- University. *Journal of Educational and Psychological Studies, King Saud University*, 10(3), 476–479.
- Schier, M. A., & Shields, D. (2009). An online tool for managing student assignment selection. In Same places, different spaces. In *Proceedings of the Ascilite*. Retrieved from <https://ascilite.org/conferences/auckland09/procs/schier.pdf>
- Schmidt, K. (2002). Classroom action research: A case study assessing students' perceptions and learning outcomes of classroom teaching versus on-line teaching. *Journal of Industrial Teacher Education*, 40(1), 45–59.
- Schoepp, K. (2005). Barriers to technology integration in a technology-rich environment. *Learning and Teaching in Higher Education: Gulf Perspectives*, 2(1), 56–79.
- Sekaran, U., & Bougie, R. (2013). *Research methods for business: A skill building approach* (6th ed.). John Wiley & Sons.
- Shroff, R. H., Deneen, C. C., & Ng, E. M. W. (2011). Analysis of the technology acceptance model in examining students' behavioural intention to use an e-portfolio system. *Australasian Journal of Educational Technology*, 27(4), 600–618.
- Sneller, J. E. (2004). A web dream team: The seven principles and WebCT. *Academic Exchange Quarterly*, 8(4), 130–134.
- Sumak, B., Hericko, M., Pusnik, M., & Polancié, G. (2011) Factors affecting acceptance and use of Moodle!: An empirical study based on TAM. *Informatica*, 35, 91–100.
- Venter, P., Van Rensburg, M. J., & Davis, A. (2012). Drivers of learning management system use in a South African open and distance learning institution. *Australasian Journal of Educational Technology*, 28(2), 183–198.
- Weldon, A., Ma, W. W. K., Ho, I. M. K., & Li, E. (2021). Online learning during a global pandemic: Perceived benefits and issues in higher education. *Knowledge Management & E-Learning*, 13(2), 161–181.
- Wright, K. B. (2005). Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication*, 10(3): JCMC1034.
- Yoon, C., & Kim, S. (2007). Convenience and TAM in a ubiquitous computing environment: The case of wireless LAN. *Electronic Commerce Research and Applications*, 6(1), 102–112.
- Yoon, H. Y. (2016). User acceptance of mobile library applications in academic libraries: an application of the technology acceptance model. *The Journal of Academic Librarianship*, 42(6), 687–693.
- Zaki, H. A., & El Zawaidy, H. (2014). Using blackboard in online learning at Saudi universities: Faculty member's perceptions and existing obstacles. *International Interdisciplinary Journal of Education*, 3(7), 141–150.
- Zhu, W. (2004). Faculty views on the importance of writing, the nature of academic writing, and teaching and responding to writing in the disciplines. *Journal of Second Language Writing*, 13(1), 29–48.