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Using the UTAUT model to examine the acceptance behavior of synchronous collaboration to support peer translation

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The teaching of translation has received considerable attention in recent years. Research on translation in collaborative learning contexts, however, has been less studied. In this study, we use a tool of synchronous collaboration to assist students in experiencing a peer translation process. Afterward, the unified theory of acceptance and use of technology (UTAUT) and a partial least squares regression approach are used to explore students' perspectives on the synchronous collaboration. Specifically, the study is constructed in a technical university in Tainan, Taiwan. A total of 27 participants enrolled in the study. The results show that most of the hypotheses we had developed before the study were supported by the data we collected, and further reveal that the construct of facilitating conditions is the most important determinant of students' intention to use the synchronous collaboration, followed by social influence and effort expectancy. The results indicate that the construct of facilitation conditions, such as the usage of new technology or problem solution, plays a significant role when integrating new technology since students will be more familiar with the new technology. Finally, both the implications and limitations of this study are discussed, and further research directions are proposed.

Keywords: UTAUT, synchronous collaboration, peer translation, facilitating conditions

Introduction

According to Danan (2010) and Niño (2008), translation should be regarded as having a fundamental role in second language learning. Since the 1980s, researchers have increasingly promoted translation

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as a useful language-learning exercise, especially when it receives attention as a helpful language-learning approach (Cook, 1998; Schjoldager, 2004; Widdowson, 1978). Translation can also significantly assist students in their efforts to achieve competence in the English language (Sewell, 1996), and translation plays a significant role in improving communication (Niño, 2008). Widdowson (1978) has also pointed out that it is necessary for language learners to use language for "the achievement of genuine communicative purposes." Moreover, by employing the translation activity, understanding the decision-making procedures essential in reaching the communication's overall purpose can push language learners to discover unfamiliar or specific scopes of the target language, and support students in applying the language to creatively inform their meaning (Stibbard, 1998).

Translation in language teaching

Translation involves presenting the source language text in the target language. In this way, translators need to ensure that the two language texts look approximately similar to one another. In addition, the sentence structure of the source language should be maintained as much as possible, though it is not essential that it remains completely the same. Translation can also be defined as a written or spoken expression of the meaning of a word, speech, or book in another language (Bassnett, 2013). Translation is not only a process, but also a product (Hatim & Munday, 2004), which means that the outcome is also of primary importance.

For language learners, translation can be an extremely challenging task. Nida's (1964) model of the translation process consists of three main steps. The first step is to analyze the source language text, including understanding the vocabulary, syntactic structure, logical relationship, and cultural meaning of the original context. Next, the second step is to transfer the source language text into the target language. Translators need to employ the appropriate translation strategies and rules to change the text from one language to another. In order to achieve this, translators must have not only language competence, but also they must possess sufficient cross-cultural communication abilities. The third step is to restructure the target language into a format that is both grammatically accurate and also readable to speakers of the target language. In order to be able to undertake translation activities, learners need to be able to restructure the translation format from the results of their analysis and transfer. They need to possess a sufficient level of language proficiency, as well as consider their readers' needs, if they have a useful output.

Numerous studies have been carried out utilizing technology in translation learning activities. Computer-supported translation tools have allowed students to connect to model translations and access helpful hints regarding various translation approaches (e.g., Talbot, 1996). Shei (2005) applied a hierarchical semantic network model to build a computer-aided composition tool that could be used to improve language learners' competence in writing and translation. His tool was especially useful in examining students' sentences and offering students similar sentences that could be used to judge how closely their translations of the same word in two different languages could be interpreted and refined. Chen, Huang, Chang, and Liou (2005) developed an online corpus-based paraphrasing assistance system that provides vocabulary input and then lists a series of paraphrases in Chinese and English, immediately following with usage and sentence examples. This offers considerable support for language learners hoping to incorporate some varieties into their language use while they were engaging in writing or translating. The outcomes resulting from use of this

system demonstrate that the system offers numerous benefits to students' learning, which is in contrast to online tools such as online dictionaries and thesauruses.

Collaborative learning

Though the above-mentioned studies show that technology can be useful when developing skills in translation, such technology does not provide students with practice in collaborative learning when practicing translation. The definition of collaborative learning used here follows the constructivist theory (Pavlenko & Lantolf, 2000; Harel & Papert, 1991; Papert, 1996), which claims that active learners must build up knowledge for themselves (Geary, 1995) through interactions with individuals and their surroundings (Schunk, 1996). In other words, the constructivist theory disputes the notion that knowledge is merely passed on from teacher to student, and instead argues that knowledge is established in students' minds patterns of active learning (Harel & Papert, 1991; Palincsar, 1998). Correspondingly, constructionism highlights that students must build up individually meaningful artifacts for learners to use in sharing and expanding their understanding within the learning community (Girvan, Tangney, & Savage, 2013). In constructivist learning, active learners involve themselves in learning through the debate, exchange, and mediation of ideas and the collaborative settlement of issues; what teachers must do is assist the students' progress in these learning activities (Palincsar, 1998). Therefore, collaborative learning emphasizes interactions among students. During the learning process, students share their experiences and knowledge with each other (Liaw, Chen, & Huang, 2008). Similarly, Lave and Wagner (1991) mention that learning is not only an individual's process of gaining knowledge, but also an interactive process that takes place within the community. Collaborative learning using technology has gained increased attention as well over the past several years (Liaw, Chen & Huang, 2008), and the potential to bring learners together using different tools has opened up a range of possibilities for activities that capitalize upon the affordances of these technologies.

Synchronous collaboration and Google Docs

In the current study, we applied synchronous collaboration to support peer translation activities and further investigated the factors that influence students' intentions to use synchronous collaboration. For educational software designers, an understanding of those factors affecting students' intentions to use educational software is vital (Escobar-Rodriguez & Monge-Lozano, 2012) since technology acceptance is regarded as the key indicator of success in any technology field (Chatzoglou, Sarigiannidis, Vraimaki, & Diamantidis, 2009; Davis, 1989; Davis, Bagozzi, & Warshaw, 1989). Therefore, understanding more about the determining influences on students' intentions to use synchronous collaboration will enable researchers to establish more efficient and agreeable forms of synchronous collaboration. Particularly, we adopted Google Docs, which is a well-developed system and a common form of synchronous collaboration for use in the required translation course; this system was incorporated with the Unified Theory of Acceptance and Use of Technology (UTAUT) to analyze students' understanding and impressions of synchronous collaboration.

Google Docs is an online tool which allows students to edit and negotiate meanings synchronously. Group members were required to translate from one language to another

(from Chinese to English), a process which demands the negotiation of overlapping shared online space (Bassnett, 2013; Yang, 2011).

Testing the model on a sequence of analyses yielded the results detailed in the sections which follow. We augmented the study to confirm the use of UTAUT in anticipation of the students' employment of synchronous collaboration. Throughout the research process, we distinguished certain vital constructive implications in the acceptance and use of the above-mentioned technologies. The UTAUT is described in more detail below.

Theoretical framework

Venkatesh *et al*. (2003) proposed the UTAUT, a notion that earlier research used to clarify individuals' usage behaviors related to information systems. The theory incorporates eight models: the theory of reasoned action (Fishbein & Ajzen, 1975), the model of personal computer utilization (Thompson, Higgins, & Howell, 1991; Triandis, 1977), the social cognitive theory (Bandura, 1986; Compeau & Higgins, 1995), the technology acceptance model (Davis, 1989), the theory of planned behavior (Ajzen, 1991), the innovation diffusion theory (Moore & Benbasat, 1991; Rogers, 2003), the motivational model (Davis, Bagozzi, & Warshaw, 1992), the combined technology acceptance model, and the theory of planned behavior (Taylor & Todd, 1995). According to Venkatesh *et al*. (2003), users' intentions to utilize technology systems and their successive usage behaviors are affected by four main variables: performance expectancy, effort expectancy, social influence, and the facilitation of conditions. The definition of performance expectancy is the degree to which people are convinced that employing a given system will assist them in gaining support in job performance. Effort expectancy refers to the degree of ease related to system usage. Social influence means that individuals realize that other prestigious people should utilize a particular new information system. The construct of facilitating conditions represents that people believe that organizations exist to sustain system usage. In the studies by Chiu and Wang (2008) and Teo (2011), performance expectancy and effort expectancy functioned as perceived usefulness and perceived ease of use, respectively. By applying the UTAUT model, researchers are able to comprehend whether or not the technology system fits users' criteria and, additionally, can illustrate the system's value. The role of technology acceptance is vital in developing successful e-learning systems, which can be evaluated by utilizing the UTAUT (Chen & Huang, 2012; Wang, Wu, & Wang, 2009). As a consequence, the UTAUT was considered to be an essential theoretical factor in exploring students' stands on the synchronous collaborations investigated in this study. Figure 1 shows a research model comprised of four hypotheses derived from the UTAUT (Chiu & Wang, 2008; Teo & Noyes, 2014; Venkatesh *et al*., 2003; Wong, Teo, & Goh, in press).

Prior research concerning the acceptance of technology has pointed out that performance expectancy of technology has played an important role on users' behavioral intention (Chiu & Wang, 2008; Teo & Noyes, 2014; Wong *et al.,* in press). Outcomes from Venkatesh *et al*. (2003) also showed that performance expectancy is the powerful indicator of behavioral intention to use technology. In addition, performance expectancy is associated with perceived usefulness in the technology acceptance model. Huang *et al*. (2012) and Liu *et al*., 2010 supplied empirical data to support the connection between perceived usefulness and behavioral intention in the e-learning circumstance. Likeness, Mendoza, Carroll, and Stern (2008) claimed that students will not sense any long-term advantages for utilizing technology if they discontinue using it. In the current study, performance expectancy stands for

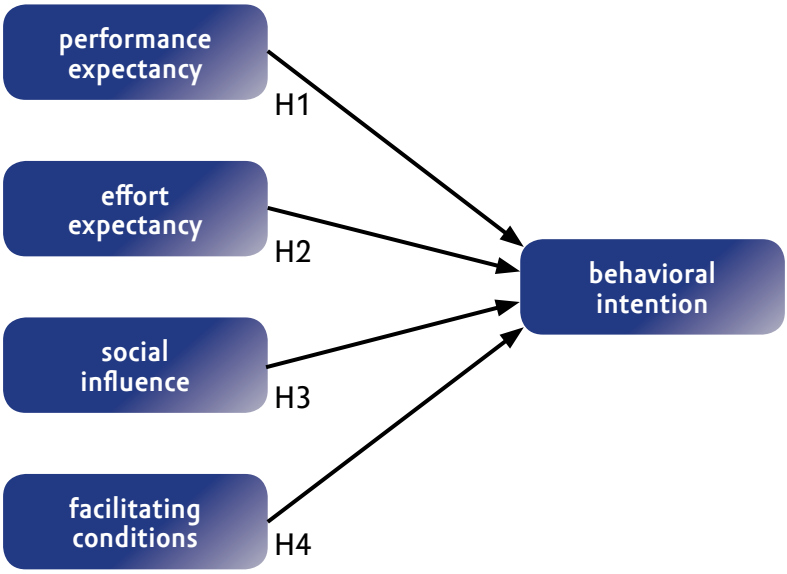


Figure 1. Research model based on the UTAUT theoretical framework.

students' conviction that collaborating synchronously will assist them to gain advantage on their peer translation. From the above discussion, hypothesis was proposed as follows.

H1. Performance expectancy will significantly and positively influence students' intention to use synchronous collaboration.

Previous literature suggests that the issue effort expectancy has been regarded as a significant factor in technology acceptance (Chiu & Wang, 2008; Teo & Noyes, 2014; Wong *et al.*, in press). Effort expectancy is relevant to perceived ease of use in the technology acceptance model, which estimated that the system easier to use was more possible to elicit perception of usefulness and behavioral intention. Moreover, it has been displayed that effort expectancy is an important predictor of behavior intention through applying the technology acceptance model (Davis *et al.*, 1989) and the UTAUT (Venkatesh *et al.*, 2003). The above studies support information that effort expectancy is substantial to technology use, and it seems that students who have high effort expectancy are more possible to advance his use of synchronous collaboration. In this study, effort expectancy stands for the boundary that a student thinks that using synchronous collaboration could request little effort and let him have no distractions. From the discussion above, the following hypothesis was proposed.

H2. Effort expectancy will significantly and positively influence students' intention to use synchronous collaboration.

Previous literature indicates that social influence is weighty in changing a person's

intention to use technology (Teo, 2009; Thompson *et al.*, 1991; Venkatesh & Davis, 2000). Social influence is identical to subjective norm (Venkatesh *et al.*, 2003) and indicates the influence of environmental aspects; for instance, viewpoints of users' friends, families, and seniors on user behavior (Lopez-Nicolas, Molina-Castillo, & Bouwman, 2008). Their standpoints will have effect on users' adoption of technology usage. Based on innovation diffusion theory (Moore & Benbasat, 1991; Rogers, 2003), users have tendency to communicate more to explain their information technology adoption. Frequent interactions will affect the adoption determination. Research has shown that when technology is inventive with high uncertainty, people will decide whether to adopt or not based on others' viewpoints (Venkatesh & Davis, 2000). In this study, social influence refers to those important people for students who think that students shall or shall not use the synchronous collaboration. From the discussion above, the following hypothesis was proposed.

H3. Social influence will significantly and positively influence students' intention to use synchronous collaboration.

The construct of facilitating conditions is the component in the setting that smoothes the system usage to carry out a particular duty (Teo, 2009; Terzis & Economides, 2011). This construct does not compare with other conditions. Explicitly, facilitating conditions consist of resource determinants (e.g., time for training) and technology factors (e.g., system compatibility) (Lu, Liu, Yu, & Wang, 2008). It is reported that users will not have full aspiration to use the system if they may have inadequate time for training or there are issues regarding incompatibility. Consequently, the facilitating conditions should take in providing training and sufficient support. Numerous past studies have displayed that facilitating conditions are crucial factors that affect using information systems. The results of Venkatesh *et al.* (2003) were corroborated by the following studies (Chiu & Wang, 2008; Teo & Noyes, 2014; Wong *et al.*, in press). In this research, facilitating conditions stand for the degree that individuals think organizations provide support to use synchronous collaboration. The facilitating conditions contain the counsel and direction in using synchronous collaboration. From the discussion above, the following hypothesis was proposed.

H4. Facilitating conditions will significantly and positively influence students' intention to use synchronous collaboration.

Method

Tool of synchronous collaboration

As described above, Google Docs is an online word processing tool which allows online creation and sharing of work which can be accessed from anywhere. Its main feature is to allow students directly to manage documents so that peers can edit their files collaboratively on the Internet. Most importantly, compared to other collaborative tools, Google Docs provides students with a platform for synchronous collaboration. Figure 2 shows a sample Google Docs editing screen that students used to translate collaboratively. In addition, students are able to check their collaboratively translating situation anytime. During the process, as long as collaborative translators have editing contents such as adding or deleting words, peers can examine the revising contents immediately. Furthermore, students could apply

track and changes function to follow who made changes and compare the discrepancies between different files. Teachers can use this function to check every student's process of participation and translation. In addition, the teacher assigned each group member a role. During the translation group activity, the teacher tracked each student's editing process by using a different color for each member of the group. Hence, the teacher could ensure that all students contributed rather than less-engaged students let their peers do all the work. The purpose of translation is to understand authentic target language structures, and the teacher was able to tell whether the students acquired formulaic sentences.

Figure 2. An example of a Google Doc.

Procedure

At the beginning of the experiment, the participants took part in the practice from a required translation course. First of all, the instructor provided students translation steps and instruction, and then showed them how to use Google Docs to implement the group translation activity. Next, students tried to use Google Docs and see whether they have questions or not. During the translating procedure, if students have questions, the instructor helped answer them. Lastly, after the activity was accomplished, the participants were requested to fill out the questionnaire that investigated the proposed research model.

Participants and data collection methods

The 27 participants of this study were students from a technical university in Tainan, Taiwan. Based on the English admission test, students were assorted as being at the intermediate level of English proficiency.

The questionnaire was created and revised according to the review of past studies (Chiu & Wang, 2008; Venkatesh *et al.*, 2003; Wang *et al.*, 2009) and comments from two experts

and ten participants. The questionnaire encompassed five constructs including performance expectancy, effort expectancy, social influence, facilitating conditions, and behavioral intention. The finalized questionnaire was given to students who were asked to point out the degree of agreement along with a series of descriptions on a five-point Likert scale (1 = "Strongly disagree" to 5 = "Strongly agree"), which is a well-known and often used scale (Huang *et al.*, 2012; Teo & Noyes, 2014).

Results and discussion

Due to the small sample size, the data were analyzed according to the partial least squares regression (PLS) approach, an alternative to structural equation modeling as PLS is able to operate with only a small sample (minimum sample size = 20, Chin & Newsted, 1999). In this research, *SmartPLS 2.0* was used to evaluate the measurement and structural models (Ringle, Wende, & Will, 2005).

Measurement model

The measurement model was assessed using item loadings, convergent validity, reliability of measure, and discriminant validity. An item was considered to be reliable if its loading was greater than 0.70 (Chin & Newsted, 1999). The convergent validity was assessed through the average variance extracted, which had to exceed a standard minimum level of 0.5 (Hair, Black, Babin, Anderson, & Tatham, 2006). The reliability of the measures was examined through the use of composite reliability and Cronbach's *alpha*. In general, the minimum value of composite reliability is 0.7, and the minimum value of Cronbach's *alpha* is 0.6 (Hair *et al.*, 2006). The discriminant validity was assessed by using the square root of the average variance extracted and latent variable correlations. The square root of the average variance extracted of each construct should exceed the correlation shared between one construct and other constructs in the model (Fornell & Larcker, 1981). Tables 1, 2, and 3 show that the results of the measurement model were acceptable, because all the values meet the standard levels.

Structural model

The structural model was used to verify the hypotheses by using path coefficients and R^2 value (Chin & Newsted, 1999). The R^2 was used to assess the ability of the model to explain the variance in the dependent variables. The path coefficients were used to assess the statistical significance of the hypotheses. Figure 3 shows the results of the structural model.

The model explains 73% of the variation in behavioral intention. Four path coefficients were also given in Figure 3. First, the path coefficient between performance expectancy and behavioral intention was 0.14, $p > 0.05$, which indicated that performance expectancy did not have a positive and significant influence on behavioral intention. Second, the path coefficient between effort expectancy and behavioral intention was 0.20, $p < 0.05$, indicating that effort expectancy had a positive and significant influence on behavioral intention. Third, the path coefficient between social influence and behavioral intention was 0.26, $p < 0.05$, which showed that social influence of use had a positive and significant influence on behavioral intention. Fourth, the path coefficient between facilitating conditions and behavioral intention was 0.47, $p < 0.05$, which demonstrated that facilitating conditions

Table 1: The item loadings for the measurement model

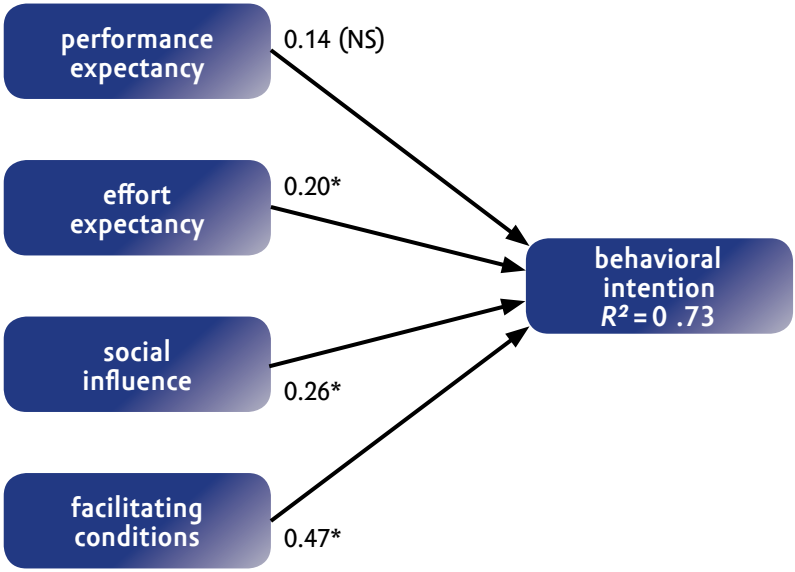
Construct	Items	Loading	Standard deviation	Standard error	T-value
Performance expectancy	PE1	0.90	0.04	0.04	19.01
	PE2	0.93	0.04	0.04	20.03
	PE3	0.94	0.01	0.01	56.83
Effort expectancy	EE1	0.90	0.02	0.02	39.94
	EE2	0.89	0.02	0.02	37.10
	EE3	0.78	0.05	0.05	13.09
Social influence	SI1	0.92	0.02	0.02	37.01
	SI2	0.97	0.00	0.00	239.56
	SI3	0.94	0.01	0.01	63.77
Facilitating conditions	FC1	0.71	0.10	0.10	6.54
	FC2	0.86	0.03	0.03	22.56
	FC3	0.84	0.02	0.02	36.78
Behavioral intention	BI1	0.94	0.01	0.01	69.90
	BI2	0.93	0.01	0.01	52.70

Table 2: The convergent validity and reliability of measures for the model

	Convergent validity	Reliability of measure	
Construct	AVE	Composite reliability	Cronbach's *alpha*
Performance expectancy	0.86	0.95	0.92
Effort expectancy	0.74	0.89	0.82
Social influence	0.90	0.96	0.94
Facilitating conditions	0.65	0.84	0.75
Behavioral intention	0.88	0.94	0.87

Table 3: The discriminant validity measures for the model

	Discriminant validity				
	Latent variable correlations				
Construct	Performance expectancy	Effort expectancy	Social influence	Facilitating conditions	Behavioral intention
Performance expectancy	0.92				
Effort expectancy	–0.14	0.86			
Social influence	0.72	0.21	0.94		
Facilitating conditions	0.36	0.40	0.69	0.80	
Behavioral intention	0.48	0.43	0.74	0.79	0.93



Note: Marked coefficients (*) are significant at $p < 0.05$ ($T > 1.96$).
NS = non-significant

Figure 3. The results of the PLS analysis.

had a positive and significant influence on behavioral intention. These results indicated that there was one hypothesis that refuted the prediction, namely H1, while the others confirmed the predictions; that is, H2, H3, and H4.

From the results, we observed that when applying synchronous collaboration in peer translation, facilitating conditions is of most importance, followed by social influence. The reasons for this outcome can be obtained from the experimental procedures. During the process, it was the first time for students to conduct peer translation by using Google Docs. Various problems did arise during the process; however, one main problem was how to set up the file's collaborative translation. Due to the study being carried out in a classroom situation, when students did encounter a problem, the instructor or teaching assistant was able to provide guidance during the activity. Generally speaking, students' questions could all be solved and students were able to continue using Google Docs to carry out their peer translations. Therefore, facilitating the appropriate conditions can play a significant role to impact students' intention to use technology. With exception to this point, this activity is considered as being teamwork, meaning that social influence is of subordinate importance.

Conclusions

Our study examined the use of Google Docs as an online tool for synchronous collaboration in peer translation. In order to investigate students' standpoints with regards to

synchronous collaboration, the research model was constructed according to the UTAUT, and partial least squares regression was employed to evaluate the model. The empirical findings corroborated the proposed research model and hypotheses, and showed that all except one of the hypotheses could not be supported. Lastly, we found that facilitating conditions was the main factor, followed by social influence and effort expectancy on students' intentions to use synchronous collaboration.

The results show that when a new technology is integrated into teaching, facilitating conditions plays a significant role, especially when the technology is innovative. The reason for this result is likely that students did not initially know how to use the technology. Training in a new technology is important in assisting students in gaining familiarity quickly (Hubbard, 2004), and thus can further influence students' intentions to use the technology. The results support the study by Escobar-Rodriguez and Monge-Lozano (2012). These researchers claimed that educational training with technology could raise students' learning outcomes when using that technology, because after the training students would not need to spend time finding out how to use the technology. Additionally, the direct observations of students' usage behaviors made in the course of this research also help to explain the results. During the experiment, many students were very surprised to learn the function of Google Docs, because when they keyed in any words or revised any sentences on their own computer, other classmates could immediately see the editing results on their own screens. The students all believed this technology to be useful in speeding up their collaborative translations because their translation work among their classmates could be checked promptly. They could discuss the translation results instantly and thus better complete their sentence translations. From the study, it can be concluded that students held positive overall attitudes toward the usage of Google Docs.

It should be pointed out that this project did have some limitations. First, all measurements utilized in this study were restricted to the students' self-reported opinions. In future studies, we would incorporate supplementary assessments to investigate the perceptions of students concerning synchronous collaboration. Next, all participants were obtained from the same department of a technical university. Since they were a nearly homogeneous group, we did not analyze their demographic data. In the future, we would select students from different departments as our subjects, and then categorize their profiles according to gender, age, and educational background such as freshmen, sophomores, juniors, and seniors. Third, expanding the sample size would naturally raise the validity of the findings, and this is another aim of our future work.

Lastly, this study focused on experiences, perceptions, and accepted behaviors. It did not address students' translation skills, language proficiency levels, or learning outcomes. In other words, it explored whether processing collaborative translations by utilizing Google Docs would be helpful because the program would allow for discussions regarding the translation work to be pieced together with simultaneous group editing. We will progress towards an experimental design focused on exploring whether Google Docs, when applied in collaborative translations, could be useful in improving students' language abilities.

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