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An experimental study of cyber face-to-face vs. cyber text-based English tutorial programs for low-achieving university students

Ejean Wu^a, Wen-Chuan Lin^b, Shu Ching Yang^{a,*}^a Graduate Institute of Education, National Sun Yat-sen University, 70 Lien-hai Rd., Kaohsiung 80424, Taiwan, ROC^b Wenzao Ursuline College of Languages, Taiwan

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ABSTRACT

This study examines the effects of two types of e-tutoring interventions (text-based vs. face-to-face videoconferencing, TB vs. F2F) on the grammar performance and motivation of low-achieving students. The study investigates the patterns of interaction between tutors and students in both platforms, including the manner in which tutors and students engage during the tutoring sessions. The students' experiences and perceptions of e-tutoring interventions are also explored. The findings reveal that although the two modes of tutoring were equally effective (both groups showed improvement in their grammar performance, with no discernible difference between the two groups), the F2F group members overcame their negative feelings toward English to a greater extent than the TB group members. Interestingly, although the findings reveal that the TB tutors engaged in more tutoring strategies than the F2F tutors, the F2F students perceived more self-improvement in their English performance and were more likely to evaluate the tutors and the e-tutoring program positively than the TB group. The paper concludes by offering some recommendations for future studies on different tutoring modes using computer conferencing.

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1. Introduction

Since English is one of the dominant languages in the world and on the web, enabling university students to be proficient in English is an important goal of higher education, especially so for countries where English is not the native language. The Taiwanese government encourages universities to require English proficiency tests as part of their curriculum. The goal is to produce university students who are proficient in English upon graduation. However, despite the fact that most students have studied English in primary or junior high school, many are unable to meet the requirements for graduation.

There are several reasons for this poor English performance. According to Dreyer and Nel (2003), many students who register for undergraduate study are underprepared for university education. Chen, You, Yang, and Huang (2004) noted that 71% of college students in the technological and vocational education system do not have the required ability in college reading and that these students' English reading proficiency is at a junior or senior high school level. The problem is exacerbated by the existing teacher-dominated English language instructional model, with a traditional class size of over 60 students and lectures delivered by one instructor.

In an attempt to address these issues, the Taiwanese Ministry of Education (MOE) launched the *Teaching Excellence Development Program* to introduce teaching assistant (TA) programs into higher education (The Ministry of Education, 2007). However, teacher workload did not decrease, even with the help of face-to-face tutorials in large classrooms. To resolve this problem, Information and Communications Technologies (ICT) and the Taiwan University Distance Education Act of 2008, established by the Ministry of Education, supplemented face-to-face lecture-based teaching with online instruction, known as e-learning. E-tutoring English programs (ETEP) were established to help low-achieving students learn English and to enhance their motivation. The E-tutoring English programs leverage an abundance of tools and resources on the Web with the proven teaching experience of TAs to provide learners with opportunities to diagnose and guide their language learning. The goal of the E-tutoring program is to provide low-achieving students with timely remediation and resources to enhance their English performance. Thus, the purpose of this study was to evaluate the effectiveness of an ETEP mechanism focused on the

* Corresponding author. Fax: +886 7 5255892.

E-mail addresses: ejean@npust.edu.tw (E. Wu), shyang@mail.nsysu.edu.tw (S.C. Yang).

tutee's written grammar. Grammar is important because it provides a foundation for further language learning (Batstone & Ellis, 2009; Ellis, 2006; Nassaji & Fotos, 2004). Without a good base in grammar, the higher skills of reading, writing and speaking are more difficult to teach. The course of interest in this study was "Freshman English." The course focused on reading and basic writing. The course instructor observed that many of the low-achieving students had difficulties with reading and writing, noting that the grammar competences and vocabulary repertoires of these students constrained the entire reading process. Given the fact that students can be easily taught to learn vocabulary by themselves by looking up new words from dictionaries, to maximize the tutoring effect, the course instructor decided to first establish a foundation in their grammar before addressing other English skills.

A number of studies have attempted to address the differences between face-to-face and online tutoring (Heins, Duensing, Stickler, & Batstone, 2007; Jones, Garralda, Li, & Lock, 2006; Price, Richardson, & Jelfs, 2007; Richardson, 2009; Solimeno, Mebane, Tomai, & Francescato, 2008), but few have incorporated different formats of online tutoring for comparison. This paper seeks to examine the effectiveness of two different modes of online tutoring. In addition, given the lack of physical interaction between teachers, tutors and peer students in an online tutoring context, affective dimensions of language learning such as motivation and anxiety may be particularly significant for low-achieving students (Bown, 2006; Hurd, 2006, 2007a, 2007b; White, 1999). Stern (1999) contended that "the affective component contributes at least as much as and often more to language learning than the cognitive skills represented by aptitude assessment" (p. 386). Therefore, this study also examines whether affective variables such as motivation, beliefs and anxiety will impact the two e-tutoring interventions.

Based on the above discussion, this study examines the effects of two types of e-tutoring interventions (TB vs. F2F) on the grammar performance and motivation of low-achieving students. The study investigates the patterns of interaction between tutors and students in TB vs. F2F platforms, including the engagement between tutors and students during the tutoring sessions. The students' experiences and perceptions of e-tutoring interventions are also explored. We hope that this study will provide a reference for e-tutoring strategies and contribute to the understanding of their effects on the grammar performance of lower-achieving university students.

2. Literature review

2.1. Different modes of tutoring

E-tutoring includes various interactive modes, such as online text-based discussion (TB) and face-to face videoconferencing (F2F). Text-based online discussions offer convenience and flexibility in terms of time and place (Hara, Bonk, & Angeli, 2000), particularly for students who struggle with full-time schedules or those who require remedial tutoring. A number of studies have examined the application of text-based online discussions in a wide variety of domains (i.e., second language writing, statistics) and have found mixed results. Some studies have reported TB to be helpful in enhancing academic performance (Neumann & Hood, 2009; Rick & Guzdial, 2006; Whipp & Lorentz, 2009), critical thinking, purposeful knowledge construction and learning autonomy (Lim & Chai, 2004; Marra, Moore, & Klimczak, 2004). For example, Hudson and Bruckman (2002) found that asynchronous ICT benefits students by permitting a delayed response to questions to allow for a careful construction of grammar. However, there are problems with this tutoring format, including difficulties in structuring discussions due to the greater freedom of student control (Schellens & Valcke, 2005). Furthermore, some students who are unable to find related content may not take the initiative to discuss this issue with their tutors; these students may take a passive attitude toward learning or may not attend e-learning training sessions (Klimova & Poulouva, 2011). Some students find it difficult to discuss learning issues without actually seeing and hearing other people (Swann, 2010).

Although F2F tutoring also involves variable distances among the instructor and students, it is not as convenient or flexible as online text discussions in terms of time and space. Synchronous videoconferencing supports spontaneous interaction, immediate feedback and social presence involving audio, video and text (Grant & Cheon, 2007; Pittman, 2003; Townsend, Demarie, & Hendrickson, 2001; Wilkinson & Hemby, 2000; Yamada, 2009). Participants can see and hear each other and share information by means of different types of visual aids. There has been a great deal of promising research using synchronous conferencing in various fields of distance education (e.g., language learning, telemedicine for urgent expert diagnostics, business for training employees and communicating with other sites and nursing programs for increased student interaction).

Jennings and Bronack (2001) found that instructional designers and intern teachers value videoconferencing as a means of synchronous communication that fosters collaboration.

Following a series of live videoconference interactions between 227 Taiwanese students and a native English speaker, Wu and Marek (2010) supported the benefits of Internet videoconferencing in building student confidence, leading to the result of improved ability. By integrating whiteboards, document sharing and audio/video features, Chen, Wang, Wu, and Levy (2008) found that online language learners were provided with more authentic opportunities to engage in listening, speaking and writing. Similarly, Pattillo's study (2007) found that participants felt that synchronous audio conferencing increased communication between instructors and students. Although interactivity is a key advantage of synchronous conferencing (Greenberg, 2004), it must overcome challenges in successful implementation, such as technical difficulties, audio and video quality, distractions and lack of physical human interaction (Knipe & Lee, 2002; Wilkinson & Hemby, 2000). Negative results have also been reported. For example, Freeman (1998) found that learning activities and interactions were not improved in multi-campus large classes by the use of videoconferencing technology.

Despite the evidence that both synchronous and asynchronous types of instruction have a positive impact on student learning (Park & Bonk, 2007; Shi, Mishra, Bonk, Tan, & Zhao, 2006; Smyth, 2005; Thurston, Duran, Cunningham, Blanch, & Topping, 2009; Tsuei, 2012), there is little understanding of which mode of tutoring is most effective or how tutors and students interact in these formats and perceive them. Therefore, it is interesting to examine the effects of two e-tutoring interventions (TB vs. F2F) on the English performance of low-achieving students.

2.2. Motivation to learn a second/foreign language

Motivation studies have been a cornerstone of language learning research. It has been widely accepted by researchers that a student's motivation is significantly associated with their language learning outcomes (Bown, 2006). Many studies have concluded that students with high motivation generally do better (Dörnyei, 1994; Gardner, 1985, 1990), and the same is true of students with positive attitudes.

Gardner is well known as the first researcher to extensively explore motivation as an achievement variable in language learning. Gardner (1985) claimed that “motivation in the present context refers to the combination of effort plus desire to achieve the goal of learning the language plus favorable attitudes toward learning the language” (p. 10).

The socio-educational model is the main component of Gardner's motivation theory. Gardner (1985, p. 146) contended, “A central theme of the model is that second language acquisition (SLA) takes place in a particular cultural context”. In the social-educational model of SLA, Gardner identified motivation as the core driving force for L2 learning and sub-divided motivation into two components: integrative and instrumental (Gardner, 1985; Gardner & Lambert, 1972). An integrative orientation refers to positive feelings toward the target language culture as the reasons that motivate study, such as the enjoyment of learning or a special interest. The instrumental orientation, however, indicates that learners pursue a language for utilitarian reasons, including advancing in school or in one's career.

Gardner's motivation theory, as a social psychological framework, has provided the dominant understanding of L2 learning motivation. As Ushioda (2001) noted, “For some three decades, the evolution of research on this subject was strongly shaped by social-psychological theories of language learning” (p. 94). However, as Gardner's perspective was too broad in some respects and too limited in others, the findings of L2 learning motivation studies could hardly solve the problems met by language teachers in the classroom. Researchers (Crookes & Schmidt, 1991; Dörnyei, 1994; Oxford & Shearin, 1994) called for a re-examination of L2 motivation and investigated the application of motivation variables in psychology and education (such as incorporating classroom and task variables in motivation models) beyond the traditional social psychological theory of language learning motivation.

Expectancy-value theory (EVT) is one of the theories to challenge the tenets of Gardner's social-educational model and is related to other cognitive approaches through its emphasis on the student's perception of their learning situation. In EVT, the motivation to perform a task is crucially dependent on two factors: the “individual's expectancy of success in a given task” and “the value the individual attaches to success on that task” (Dörnyei, 2001, p. 20). Expectancy is defined as an “individual's beliefs about how well they will do on upcoming tasks, either in the immediate or longer-term future” (Eccles & Wigfield, 2002, p. 119). In addition, the value of a task is “determined by both the characteristics of the task and by the needs, goals, and values” of the task performer (Eccles & Wigfield, 2002, p. 89). The EVT emphasizes that learners often have reasonable expectations for attaining a goal and a confirmation of the value of achieving that learning goal to sustain their motivation for language learning. That is, perceived competence and intrinsic value are key constructs within the EVT of achievement motivation (Wigfield & Eccles, 2000) and are assumed to be influenced by task-specific beliefs such as ability beliefs, the perceived difficulty of different tasks, and individuals' goals.

Within EVT, Eccles et al. (1983) developed a comprehensive model of task values in terms of four components: attainment value, intrinsic value, utility value, and cost. Attainment value refers to the personal importance of doing well on a given task. Intrinsic value refers to the degree of personal interest or enjoyment obtained from performing the activity. Utility value or usefulness is determined by how well a task serves the individuals' present and future goals, for instance, in taking a language class to fulfill a degree requirement. Finally, cost refers to how the decision to engage in one activity confines other activities, including assessments of how much cognitive and emotional effort is involved in a task.

In summary, many studies argue for the importance of attitudes and motivation in students' foreign language learning. In the context of this research study, the EVT of motivation is adopted to practically explain the role of motivation in specific learning situations such as English tutoring.

Like any motivation theory, EVT is not comprehensive, but it provides a good explanation of how low-achieving students' expectancy for success, perception of competence, and assessment of the usefulness of learning English form the basis of their efforts and achievement.

3. Methods

3.1. Participants

This study examines the effects of two types of e-tutoring intervention (text-based vs. cyber face-to-face, TB vs. F2F) on the grammar performance and motivation of low-achieving students. Eight fourth-year e-tutors majoring in English came from a foreign language learning college in Southern Taiwan with previous experience and training in English e-tutoring through synchronous and asynchronous discussions. Four of these e-tutors were responsible for the online text-based group, and the others supported the cyber face-to-face group.

Thirty-six freshmen (26 men and 10 women) from several university science and technology departments in southern Taiwan participated in the study. All participants enrolled in the 3-credit ‘Freshman English’ course in their first semester and received an A2 level (scores ranged from A3 (>60 = good) to A1 (<50 = worse)), which required them to attend the weekly ‘Freshman English Grammar Improvement’ program in their second semester. They were randomly assigned to two types of e-tutoring treatment. In each treatment, the participants were randomly assigned to 4 groups, each consisting of 4 or 5 members and receiving the help of an e-tutor.

3.2. Research design

The teaching experiment in this study was initiated and performed using equivalent pre-test and post-test group designs. The two English tutorial programs were designed to assist grammar performance during the 13-week e-tutoring term (see Table 1 and Fig. 1). In the TB group, participants raised questions any time on the discussion forum, and e-tutors were required to respond to all individual postings at least once a day. In the F2F group, e-tutors activated the webcam and microphone/speaker feature to present a weekly 1-h video tutoring session. Students could review the recorded e-tutoring session and deliver comments at any time.

In this study, the e-tutor training tutorial addressed the tutors' social and pedagogical role for each e-tutoring session to provide a framework for improving the grammar and writing skills of each student. The tutorial included a 1-h e-tutoring technology training session two weeks prior to the term, an online introductory meeting in the second week of the semester (to introduce tutors and group members), and 13 weeks of online tutoring. Each group had the same course instructor and received weekly 2-h instruction in grammar and writing during the full 18 weeks of the semester. Both groups of students took tests at the beginning of the study, tests, and surveys at the end of the semester.

Table 1
Two types of e-tutoring interventions.

Groups	Cyber text-based group (TB)	Cyber face-to-face group (F2F)
Media format	<ul style="list-style-type: none"> Asynchronous online discussion Pupils raise questions at any time on the discussion form; tutors respond at least once daily 	<ul style="list-style-type: none"> Synchronous videoconferencing Activate video with webcam and microphone/speaker Launch tutoring session each Friday
E-tutoring sessions Student	<p>13-weekly e-tutoring sessions, 4 e-tutors tutoring 4–5 students each</p> <p>Complete pre/post-tests as well as survey on perceptions of e-tutoring at the end of the semester.</p> <p>(1) Review the instructions (material posted by e-tutors) on Tuesday and integrate them with prior knowledge to perform the ongoing assignment. (2) Upload the required assignments on the e-learning platform by deadline. (3) Take quizzes or tests.</p> <ul style="list-style-type: none"> Hand in the ongoing assignment by deadline Raise e-tutor questions or reply any time Review materials provided by tutor or content posted on the discussion form 	<ul style="list-style-type: none"> Hand in the ongoing assignments by deadline Raise e-tutor questions or reply at given time Review materials provided by tutor and the recorded e-tutoring session
E-tutor	<p>Complete weekly e-tutoring reflection after each tutoring session and survey at the end of the semester.</p> <ul style="list-style-type: none"> Informing about objective: confirming the weekly tutoring session objective and announcement of related activities Presenting content: post content-related resources and references weekly for pupils to read. Assessing performance: assess pupils' assignments and guide their questions; use a variety of strategies to assess their understanding Providing feedback: in written format, provide constructive feedback based on pupils' assignments or questions and feedback on their inquiries or misconceptions 	<ul style="list-style-type: none"> Informing about objective: confirming the weekly tutoring session objective and announcement of related activities Presenting content: sharing multiple content-related resource (e.g., documents, files, online website etc.) through whiteboard Assessing performance: assess pupils' assignments and guide their questions; use a variety of strategies to assess their understanding Providing feedback: orally and graphically provide constructive feedback based on pupils' assignments or questions and feedback on their inquiries or misconceptions

In each e-tutoring session, the e-tutors of both groups gave weekly topic-related information, clarified any student mistakes on uploaded ongoing assignments and offered constructive feedback. At the end of each weekly e-tutoring session, tutors completed e-tutoring reflection forms with their observations (strategies and effectiveness), and the students completed a learning process form that briefly described their experiences (e.g., difficulties encountered, solutions).

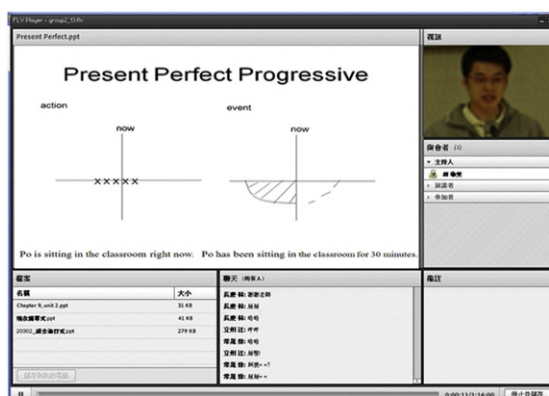
The structure of the 13-week e-tutoring regimen for both groups followed these basic steps: informing about objectives, presenting content, assessing performance and providing feedback (Klimova & Poulouva, 2011).

3.3. Data collection

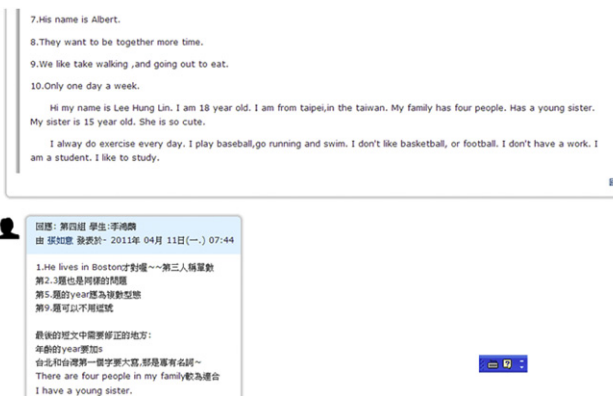
Two main sets of instruments were utilized to measure the perceptions of e-tutors and students in the study.

3.3.1. Motivation belief scale (MBS)

Motivation belief refers to a personal view of the values, expectations, and attitudes toward study and work (Eccles et al., 1983; Pintrich, 1989; Wigfield & Eccles, 2000). This study used an MBS designed by Lai (2006), based on expectancy-value theory, to measure participants'



F2F mode



TB mode

Fig. 1. The interface design of the experimental and control groups.

motivation beliefs toward English learning. The scale consisted of 6 items in each of nine subscales: (1) an intrinsic goal-oriented subscale measured students' preferences for challenge and the extent of their curiosity for study and work; (2) an interest subscale measured the degree of individual interest in English learning; (3) an importance subscale measured students' awareness of the importance of their work and study in English learning; (4) a utility subscale measured the personal perceived instrumentality or the degree of perceived usefulness of the present English learning task to attain present and future goals; (5) the control beliefs measured the perceived task selection depending on the student's choices or the impact of external forces; (6) a self-efficacy subscale measured students' assessment of their ability to learn or accomplish the task; (7) a positive affect subscale measured the degree of positive attitude (i.e., engagement and enjoyment) toward learning English; (8) a negative affect subscale measured the degree of dislike, anger, loathing, anxiety, or fear of learning English; and (9) the test anxiety subscale measured the degree of students' fear and anxiety concerning the English test.

Items were rated on a 5-point Likert scale, from 1 = *strongly disagree* to 5 = *strongly agree*. The Cronbach's coefficient alpha reliability for the entire scale was .81, and the values for the individual scales were .89–.93. Therefore, the internal consistency of the total and component scales was high (Nunnally, 1978).

3.3.2. Students' perceptions of the e-tutoring program

A survey was conducted to gather information on the participants' perceptions and attitudes regarding e-tutoring programs. The first part of the survey comprised four sections of statements about students' attitudes and perceptions toward their learning experiences. The respondents indicated their levels of agreement or disagreement on a 5-point Likert-type scale. The first section evaluated the effectiveness of the e-tutoring programs, the second section addressed student satisfaction with the design of the writing activities of the e-tutoring program, the third section sought students' self-evaluations of their English performance, and the fourth section included student evaluations of the performance of their e-tutor. Meanwhile, the second part of the survey comprised open-ended questions to evoke students' reflections regarding e-tutoring. The participants were asked about the most positive and challenging aspects of the e-tutoring programs. Data from the completed questionnaires were analyzed to elicit students' views on the nature of e-tutoring and general feedback.

3.4. Data analysis

Quantitative and qualitative analyses were conducted following the data collection. For the quantitative analysis, a *t*-test for the post-test was performed to address our first research question about the influence of the two types of tutoring on students' grammar performance and the MBS because no significant differences were found between the two groups on the pre-test. For the qualitative analysis of interactive patterns between tutors and students, researchers videotaped the F2F group during the 13 weeks of tutoring. All asynchronous discussions and activities of the TB group and synchronous activities of the F2F group were recorded and archived for later analysis. Summary data and discussions on specific themes were printed at the end of each conference.

Participants' responses and comments were broken down into excerpts with self-contained units of meaning. Participants' comments on the TB vs. F2F modes were first categorized using two codes based on their relation to either tutor support or students' learning behaviors and were then further categorized. Participants' comments were coded and classified into conceptual categories based on tutors' mentoring strategies and students' online expertise, as documented in the literature (see Table 3 for the coding framework). The content analysis of the online comments complemented the quantitative analysis of the tutors' deployment strategies and the students' learning behaviors. Reliability is defined as the level of inter-judge agreement when all messages are classified by three judges (Kassarjian, 1977). The researchers invited three Master's students majoring in education to be judges. After the judges were fully trained in conducting content analysis using the manual shown in Table 3, they separately coded the messages. This assessment method achieved an inter-judge reliability value of .88. Disagreements regarding messages were further discussed to reach a consensus.

4. Results

4.1. Quantitative results

As mentioned previously, there were no significant differences between the two groups on the pre-test; thus, a *t*-test for the post-test was performed to examine whether the effect of the two types of tutoring on the students' grammar performance and the MBS differed. Table 2 shows that the experimental F2F group members had significantly less negative affect than the control TB group members in MBS ($M_{F2F} = 2.52$, $M_{TB} = 3.05$, $t = 2.12$, $p < .05$) while no significant difference was found for the other eight subscales of MBS and grammar

Table 2
Comparison of students' motivation beliefs and grammar tests for both groups.

Motivational Belief Scale	F2F M (SD)	TB M (SD)	t value
MBS total scale	3.33 (.27)	3.51 (.36)	-1.593
1. Intrinsic goal-oriented	3.74 (.50)	3.75 (.41)	-.095
2. Interest	2.94 (.59)	3.20 (.57)	-1.34
3. Importance	4.03 (.48)	3.96 (.48)	.42
4. Utility	3.81 (.59)	3.87 (.59)	-.28
5. Control beliefs	3.68 (.48)	3.74 (.47)	-.40
6. Self-efficacy	2.97 (.54)	3.33 (.63)	-1.79
7. Positive affect	2.90 (.55)	3.22 (.50)	-1.81
8. Negative affect	2.52 (.65)	3.05 (.80)	-2.12*
9. Test anxiety	3.46 (.54)	3.57 (.77)	-.50
English test	60.74 (9.79)	52.00 (17.50)	1.81

* $p < .05$, ** $p < .01$.

performance ($t = 1.81, p > .05$). Meanwhile, paired t -tests showed significant improvements for the two groups. In other words, the two modes of tutoring were equally effective, as there was no discernible difference in improvement between the two groups; however, the F2F group members overcame their negative feelings toward English to a greater extent than the TB group members.

4.2. Qualitative results

4.2.1. Analysis of tutoring strategy and student behaviors

The frequency of TA tutoring was calculated to examine how the tutors moderated the students' comments and inquiries to promote the learning of grammar and writing. The categories in Table 3, which identify widespread support strategies in electronic conferencing, reveal that the TAs in both groups used direct instruction strategies ($n_{TB} = 39, 14.44\%$; $n_{F2F} = 29, 14.80\%$), followed by examples ($n_{TB} = 36, 13.33\%$; $n_{F2F} = 27, 13.78\%$), scrutiny ($n_{TB} = 29, 10.74\%$; $n_{F2F} = 26, 13.72\%$), and guiding questions ($n_{TB} = 22, 8.15\%$; $n_{F2F} = 18, 9.18\%$). The students' questions ($n_{TB} = 28, 28\%$; $n_{F2F} = 23, 27.71\%$) and confirmations ($n_{TB} = 26, 26\%$; $n_{F2F} = 24, 28.92\%$) accounted for more than half of all behaviors. It was found that the tutors in the TB groups generally used more strategies than those in the F2F groups ($N_{TB} = 270, N_{F2F} = 196$) and that students in the TB groups showed more interactions during the tutoring sessions than the students in the F2F groups ($N_{TB} = 100, N_{F2F} = 83$). These findings are understandable because both the TAs and the students in the F2F group were limited by a given time slot and could only field one question or reply at a time, whereas the TB tutors could offer feedback at any time and reply to every student's questions, leading to a higher frequency variation.

4.2.2. Student perceptions of e-tutoring programs

Student evaluations of their performance and of the e-tutoring programs were analyzed to identify how the students perceived their learning experience, their performance and the effectiveness of e-tutoring for learning a foreign language (see Table 4). The students' perceptions of the effectiveness of e-tutoring for learning English showed that the students in the F2F group viewed e-tutoring more positively than those in the control TB group. For example, the F2F group members reported that the e-tutoring program gave them greater motivation to improve their writing ($M_{F2F} = 3.65, M_{TB} = 3.12, t = 2.36, p < .05$) and that the e-tutor provided more constructive feedback and was more helpful ($M_{F2F} = 3.85, M_{TB} = 3.12, t = 3.47, p < .01$). In terms of course design, the F2F group was more satisfied with the overall curriculum ($M_{F2F} = 3.85, M_{TB} = 3.12, t = 3.74, p < .01$), learning resources ($M_{F2F} = 4.05, M_{TB} = 3.56, t = 2.70, p < .01$) and writing frequencies as well as the guidance and feedback received from the online tutors in comparison to the control TB group ($M_{F2F} = 4.10, M_{TB} = 3.44, t = 3.36, p < .01$).

Regarding self-perceived improvements in English abilities, most students in the F2F group reported that they had achieved greater improvement in content ($M_{F2F} = 3.95, M_{TB} = 3.46, t = 2.69, p < .05$) and grammar compared with the students in the TB group ($M_{F2F} = 3.95, M_{TB} = 3.47, t = 2.69, p < .05$). With respect to TA tutoring performance, the F2F group rated eight of nine items related to TA performance more positively than the TB group; however, there was no discernible difference in the TAs' inspiration of the students' interest in learning English ($t = 1.50, p > .05$). This finding indicates that, compared with the TB group members, the F2F group members perceived their tutors as more competent, skillful and passionate, and they were more satisfied with their tutoring performance.

4.2.3. Student perceptions of e-tutors

An investigation of the reasons underlying the students' reactions to the e-tutor behaviors given in Table 5 shows various reasons for the students' approval of the e-tutors. Overall, the tutor evaluations were positive, with sporadic complaints about e-tutors (e.g., lack of

Table 3
Distribution of tutoring strategies and pupils' behaviors by category between the TB and F2F groups.

	Definition	TB	F2F
Tutor			
Scrutinize	Using affirmative, negative or interrogative sentences to carefully examine pupils' answers or replies (pushing learners to provide or seek sources of information)	29 (10.74%)	26 (13.27%)
Guided question	Using interrogative sentences, either expressed or implied, to guide pupils to post questions regarding assignments or content	22 (8.15%)	18 (9.18%)
Clarify	For recognition of sentences or questions, directly or indirectly assist pupils in distinguishing ambiguous learning content and push them to explore and elucidate (by prompting, comparing/contrasting, or triggering cognitive conflicts)	36 (13.33%)	16 (18.16%)
Confirm	Verify the accuracy of the pupils' questions or responses	28 (10.37%)	20 (10.20%)
Model	Model and demonstrate the learning content by speaking, reading or writing for pupils to follow	26 (9.63%)	20 (10.20%)
Direct instruction	Directly introducing concepts, contents or specific framework	39 (14.44%)	29 (14.80%)
Exemplify	Augmenting concepts/content by illustrating a specific example to stimulate pupils' connections	36 (13.33%)	27 (13.78%)
Praise/support	Statements referring to support and praise to encourage pupils' learning (i.e., giving feedback and praise and supporting answers or replies)	22 (8.15%)	16 (8.16%)
Learning strategies	Tutor provides or recommends English learning methods and strategies	12 (4.45%)	8 (4.08%)
General advice	Offering general advice or providing information on activities	20 (7.41%)	16 (8.16%)
	<i>Sub-total</i>	270	196
Student			
Inquiry/question	Pupil poses a question or inquiry	28 (28%)	23 (27.71%)
Confirm	Using questions or restatements to confirm and clarify tutors' questions or responses or elaborations to confirm their own questions or answers	26 (26%)	24 (28.92%)
Acknowledging understanding	Pupils indicate their understanding of the tutor or content	15 (15%)	12 (14.46%)
Reply	Pupil answers or replies to tutor's questions	18 (18%)	14 (16.87%)
Appreciation	Showing appreciation for tutor's assistance	13 (13%)	10 (12.05%)
	<i>Sub-total</i>	100	83

Table 4
Comparison of both groups' perceptions of e-tutoring programs.

	F2F M (SD)	TB M (SD)	t value
A. The implementation of e-tutoring English programs in this semester			
1. Gave me great motivation to improve my writing	3.65 (.67)	3.12 (.70)	2.36*
2. Is appropriate for English writing courses	3.70 (.73)	3.19 (.54)	2.33*
3. Created a good English writing environment	3.80 (.62)	3.35 (.61)	2.22*
4. I have learned more from the feedback provided by the tutor than by myself	4.05 (.76)	3.24 (.66)	3.44*
5. Online tutors' assessments correctly reflected my writing abilities	3.95 (.61)	3.41 (.71)	2.49*
6. The e-tutor provides constructive feedback and is very helpful for improving my writing	3.85 (.67)	3.12 (.60)	3.47**
7. When I attempt to amend an essay, I will consider the online assistant's comments	.90 (.85)	3.59 (.71)	1.19
8. The e-tutoring experience is helpful for taking a critical stance toward reading my composition	3.80 (.70)	3.31 (.60)	2.22*
9. After receiving the e-tutor's feedback and discussion activities, my revised draft is better than the first draft	4.05 (.51)	3.56 (.73)	2.27*
10. The e-tutor and discussion activities are helpful for my writing (ideas, draft, modifications, etc.)	3.65 (.88)	3.38 (.72)	1.01
11. Overall, the implementation of the e-tutoring program is helpful for my writing	4.00 (.73)	3.38 (.62)	2.74**
B. I am satisfied with the design of the e-tutoring writing activities this semester in the following areas...			
1. Learning/teaching resources (online resources, supplementary materials, etc.)	4.05 (.39)	3.56 (.63)	2.70*
2. Writing topics (topic selection and sequencing)	3.50 (.76)	3.13 (.34)	1.97
3. Writing frequency	3.50 (.61)	3.06 (.44)	2.50*
4. Online tutor guidance and feedback	4.10 (.64)	3.44 (.51)	3.36*
5. The amount of revised feedback (second feedback for revised version, feedback for the revision of first draft)	3.42 (.69)	3.24 (.66)	.82
6. Observing other pupils' work	3.25 (.64)	3.35 (.49)	-.54
7. Overall curriculum design	3.85 (.67)	3.12 (.49)	3.74**
C. Perceptions of self-improvement			
1. Content	3.95 (.41)	3.46 (.62)	2.69
2. Organization	3.63(.50)	3.46 (.62)	.86
3. Grammar	3.95(.62)	3.47 (.51)	2.49
4. Style	3.79 (.54)	3.47 (.51)	1.82
5. Mechanics	3.68 (.48)	3.53 (.51)	.94
D. TA tutoring performance			
I think that the TA...			
1. Is competent in professional English ability	4.25 (.44)	3.41 (.71)	3.36**
2. Can help to convey the teaching content	4.20 (.52)	3.29 (.59)	4.96**
3. Is able to respond to our questions	4.25 (.72)	3.41 (.71)	3.56**
4. Can provide appropriate and just-in-time solutions to our problems	4.30 (.57)	3.47 (.51)	4.61**
5. Respects our ideas and thinking	4.35 (.59)	3.41 (.62)	4.73**
6. Is willing to tutor our academic problems	4.35 (.67)	3.35 (.61)	4.71**
7. Inspires our English learning	3.85 (.75)	3.53 (.51)	1.50
8. Has the patience to guide us	4.40 (.60)	3.41 (.51)	5.36**
9. Overall, the performance of the TA is satisfactory	4.65 (.49)	3.59 (.71)	5.35**

* $p < .05$, ** $p < .01$.

encouragement or constructive criticism, providing untimely or confusing feedback). Some students were concerned about the tutors' ability to provide them with timely feedback. A few students found suggestions from the tutors to be confusing or lacking in encouragement or constructive criticism. Notably, one student in the TB group commented on his distrust of the tutor's competence and felt that the tutor did not focus on substantial parts of his writing. Regarding the perceived approval of TA performance, the students' responses were mostly positive and focused on the provision of encouragement and confidence ($n_{TB} = 13$, $n_{F2F} = 18$), the ability to identify mistakes in writing ($n_{TB} = 16$, $n_{F2F} = 17$), and feedback that contributed to the development and clarification of their writing ($n_{TB} = 12$, $n_{F2F} = 10$). The study revealed that face-to-face tutoring increased the opportunities for TAs and students to virtually interact with each other, resulting in the F2F group's perceptions of more personal interaction and individual guidance in comparison with the TB group ($n_{TB} = 8$, $n_{F2F} = 13$). It appears that although the TB group members could communicate through text forums any time and anywhere, the F2F students were required to engage in discourse with other students and tutors, giving them a feeling of greater participation ($n_{TB} = 3$, $n_{F2F} = 7$).

Table 5
Comparison of pupils' perceptions toward e-tutors in both groups.

	F2F	TB
Reasons for liking the e-tutoring program		
1. More feedback is provided to contribute to the development and clarification of my writing	10	12
2. Can identify what I missed or mistakes in my writing	17	16
3. Allows me to learn or benefit from the tutors	11	8
4. Better understanding of my writing and less threatening reviews or comments	8	6
5. E-tutors provide encouragement and confidence	18	13
6. Allow me to receive social support from more readers	7	3
7. The responses from tutors are useful and informative	8	9
8. Allows me to give priority to adopting the tutor's recommendations	8	7
9. Provides more personal interactions and individual guidance	13	8
Reasons for disliking the e-tutoring program		
1. Do not trust tutor's competence	0	1
2. Tutor places too much emphasis on surface errors and ignores more important aspects, such as content and organization	0	1
3. Tutor's suggestions are often confusing	2	0
4. Tutor's suggestions lack encouragement or constructive criticism	2	3
5. Tutor did not provide timely feedback	3	4

5. Discussion and summary

This study designed a 13-unit e-tutoring English curriculum based on two different media modes, with the aim of enhancing and mentoring the performance and attitudes of 36 low-achieving university students. The two different types of e-tutoring programs were evaluated based on a 13-week experimental tutoring program. The authors took a critical perspective as observers and researchers and examined the advantages and deficiencies of e-tutoring programs in an attempt to learn more about the difficulty and feasibility of implementing online tutoring for low-achieving students.

The two different modes of tutoring activities were designed to give students a sense of how technology-based tutoring can facilitate their language learning and to help them improve their English grammar and writing. The findings revealed that the incorporation of interactive videoconferencing and online discussion effectively provided the same language instruction, as both groups of students showed improvement in their English post-tests compared with their pre-tests, with no discernible difference in grammar performance between the two groups.

These results concur with Price et al. (2007), who reported that TA tutorial programs with face-to-face and online tutoring both assisted students in achieving similar levels of academic performance. That is, the result suggests that variations in the mode of tutorial support are not directly reflected in students' concrete output such as grades or their grammar performance in class. However, combined with the survey data about students' perceptions of e-tutoring programs, the data revealed the F2F group's self-perception of achieving greater improvement in content and grammar in comparison to the TB group. In addition, given the limited time of the interventions, the researchers allowed for the possibility of observing no significant learning effects, in particular, the possibility that low-achieving students might need more time to show significant results.

Regarding motivating belief, the F2F group was found to overcome their negative feelings toward English to a greater extent compared with the TB group. It appeared that the use of the F2F mode in online English tutoring activities was conducive to inhibiting or reducing the negative attitude of the F2F group. It may be that the F2F type of videoconferencing simulates face-to-face learning support by increasing interactive communication and by providing instant feedback, further enhancing the social and learning presence and thus reducing anxiety about learning English to a greater degree than online text-based learning. Examining the student survey, we also found that the F2F group members thought that the e-tutoring program gave them greater motivation to improve their writing. Moreover, several students in the F2F group commented in the open-ended survey that they liked the videoconferencing tutoring because the TA and group members together established a non-threatening and supportive environment, which led to greater confidence in their ability to grapple with the subject matter of English. It was inferred that the tutors' direct instruction; their timely, specific and personal feedback; and the use of affirmations or praise supplemented by the nuances of paralinguistic communication (e.g., intonation, body posture, gestures, facial expression, emphasis and non-verbal cues) in the F2F groups strengthened the participatory bond and was conducive to minimizing students' anxiety about learning English.

Interestingly, although the findings revealed that the TB tutors engaged in more tutoring strategies than the F2F group, the F2F group members perceived greater self-improvement in their English performance. Furthermore, most F2F group members were more positive about the potential of e-tutoring to improve their writing performance, and they believed that their tutors were more competent in their professional knowledge and skills. This favorable perception of F2F over TB in several areas (e.g., performance, tutor qualifications) may result from the different interactive modes of tutoring, as TB and F2F both have advantages and disadvantages. Although TB is unconstrained by time or space and students and tutors can post comments at any time (as evidenced by the greater quantity of postings by students and student-tutor interactions), it is restricted to the medium of text, which is more limiting than the multiplicity and interactivity of the F2F mode (facial, verbal and nonverbal, whiteboard). Although F2F lacks the flexibility of time and space available in TB, interfaces with online videoconferencing and a whiteboard video give students more personalized, vivid and innovative interactions. In view of the dual-coding theory, exposure to more than two kinds of media (such as animation, voice or text) used in conjunction can positively influence learning content, recall and retrieval. Students may feel that two-way interaction with face-to face contact and video images made the tutoring more elaborate and concrete, thereby motivating active, interactive and participative learning, but further study is required to substantiate this possibility.

Regarding our analysis of tutoring strategy, we found that one of the four tutor roles outlined by Berge (1995), the pedagogical role, was used most frequently by the e-tutors, supplemented by the social role (i.e., praise and support). As the findings revealed, the tutors of both groups used a wide range of pedagogical strategies (e.g., direct instruction, examples, scrutiny, guiding questions, modeling, confirmations and clarifications) to help the tutees grapple with grammar.

It was noted that the frequency of TA tutoring behavior ($n_{TB} = 270$, $n_{F2F} = 196$) was more than twice that of the students' learning behavior ($n_{TB} = 100$, $n_{F2F} = 83$), indicating that the students' initiative leaves some room for improvement. Several tutors in both modes expressed that the difficulties they encountered in tutoring included the tutees' infrequent questions and their tendency to simply check their assignments. The tutors began at the students' cognitive level and tried to support them in moving beyond this point by using methods that would make use of examples and explanations, building upon what the students already knew and helping students to arrive at an understanding of some aspect of the assignment.

This study found that TB revealed a much greater quantity and frequency of tutoring and learning activities than F2F, which might be due to the nature of the F2F tutoring: F2F was limited by a fixed time slot, and neither students nor tutors could ask or answer more than one question at a time. However, although the TB tutors/tutees engaged in more tutoring strategies and learning behaviors than did the F2F tutors/tutees, TB did not appear to satisfy the tutees' expectations. This lack of satisfaction is demonstrated by the TB group members' perception of less self-improvement in English performance and their lower likelihood to evaluate the tutors and the e-tutoring program positively in comparison with the F2F group.

It may be that the F2F group perceived a more significant benefit from the quality rather than the mere quantity of feedback and interaction as compared to the TB group. In F2F modes, 4–5 learners virtually interacting with peers and a TA together might increase learning because the learners are companions in "conversation and cooperation in context;" such a learning community might help tutees to reflect on their work and to learn from each other's questions and replies. Moreover, the two-way communication method provided instant feedback supplemented by an interactive whiteboard with animation, which might help tutees to contextualize and conceptualize the

problem (e.g., grammar rules about different tenses) and to clarify their misconceptions. The students in the F2F group expressed that they sometimes did not know how to ask a question, and they appreciated the TA's direct instruction and immediate feedback, which helped them to have a better understanding of how to tackle assignments.

As Schofield (2007) suggested, the value of the interaction between TAs and students should be focused on the effective emotional and learning support they can provide. The F2F mode may engage more channels of presentation and representation, thereby combining the facial, verbal and nonverbal reinforcement of a social presence and providing effective emotional, cognitive and learning support, leading to the tutees' perception of the F2F mode of tutoring as more preferable and effective than TB. Alternatively, the low-achieving students might particularly value virtual conferencing and interaction because it provides them with richer media and support. As Townsend et al. (2001) commented, those participants who anticipate the technology in a positive manner are more likely to evaluate it positively and perform well during the conferencing. Given this, the two groups may have individual differences (e.g., different views toward the two formats) and a different baseline evaluation toward the tutors and their own performance. Further study will be required to determine whether the preference for F2F types of support interaction may lead to F2F groups becoming more favorable than TB groups for e-tutoring programs.

Finally, in transitioning from the face to face mode to the e-tutoring mode of study and maximizing the benefits of online tutoring, the greater challenge lies in addressing the traditional mindset of the tutor as the "teacher" by transforming the tutor's role to a "facilitator" role on the one hand and by transforming students' behavior to active learner behavior on the other. The tutors commented that the students came to online tutoring sessions with inappropriate expectations or a passive attitude that might have undermined their opportunity to fully exploit the advantages of the online tutoring mechanism. While tutors themselves do need to be well-trained professionally, as they are an important catalyst in sustaining tutees' enthusiasm in an online learning tutorial, a few tutees complained about confusing or unsubstantial feedback. Given this feedback, a series of workshops for both tutors and tutees should be provided to assist both e-tutors and e-tutees in the transition from their traditional roles to more virtual and constructive roles.

6. Recommendations

Given the small sample size in this study, further studies could conduct a counterbalanced repeated measures design to further determine which ones lead to effective tutoring and clarify how students perceive and compare the two modes of tutoring. Future studies could further examine the individual differences of students (e.g., learning styles, passive or active learners, and different levels of English proficiency) and engagement levels (behavioral, social-emotional, and intellectual engagement) as well as the extent to which tutors provide a high quality and quantity of support and how different modes of tutoring affect students' performance. Moreover, future studies could employ the Community of Inquiry (COI) model proposed by Garrison, Anderson, and Archer (2000, 2001) to analyze how students perceive cognitive, social, and teaching presence in the two different modes of tutoring and to investigate the relationship between tutor moderating and student engagement in the two types of computer conferencing. It is hoped that examining the relative effects of these approaches on different modes of computer conferencing can provide a better understanding of the effect of different types of tutoring as well as suggestions on how effective tutoring can be designed with e-tutoring program and evaluation.

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