



## INTEGRATION OF COMPUTER TECHNOLOGIES INTO AN ENGLISH LANGUAGE LEARNING CLASSROOM

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### ABSTRACT

*The present study integrated computer technologies into regular English classes to examine whether using the online TOEIC simulated-test system could promote the TOEIC listening and reading test performance of a group of Taiwanese EFL learners. The participants involved in the one-academic-year study were 52 second-year Taiwanese technological college students who were required to attend classroom instruction sessions about TOEIC test preparation and online learning sessions during which they had to self-accomplish eight designated practice units of TOEIC simulated tests. Data were collected by two TOEIC simulated-test units serving as the pre- and post-tests to assess participants' TOEIC test performance in listening and reading comprehension before and after using the online TOEIC simulated-test system. The study results revealed that participants improved with a significant increase in both listening and reading post-test scores, suggesting that learning through the online TOEIC simulated-test system had a facilitating effect on the test performance of the target learners in their listening and reading comprehension.*

**Keywords:** Computer assisted language learning, Test performance, Listening comprehension, Reading comprehension, English language learning

### INTRODUCTION

#### Computer assisted language learning

The rapid development and great advancement of computer and information technologies have given rise to the use of technology-enhanced instruction in various educational settings. The modes of education have changed from purely conventional teacher-led methods to computer-

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mediated instruction or blended approaches that combine face-to-face classroom teaching with the application of multimedia and computer technologies to facilitate students to learn more effectively and help instructors teach more efficiently. As Scheffler and Logan (1999) state, “teaching no longer centers around the transfer of knowledge from teacher to student; learning comes from students inquiry, critical thinking, and problem solving based on information accessed from a variety of sources” (p. 305). It is true that teaching and learning today are being transformed into digital forms as a result of computer technologies.

In the second/foreign language (L2/FL) learning context, the application of Computer Assisted Language Learning (CALL) grows rapidly. Also, a great number of multimedia software or computer-based systems have been developed to create more effective and motivating language learning and are being used extensively in pedagogical practices. It is a fact that the use of CALL has received considerable interest and has been the subject of many studies in the fields of Second Language Acquisition (SLA) and pedagogy for decades. Numerous L2/FL research studies have provided abundant evidence to demonstrate the positive effects of CALL use on such aspects as learner perceptions (e.g., Lee, 2005; Sagarra & Zapata, 2008; Wang & Wang, 2010), vocabulary building (e.g., Akbulut, 2007; Chun & Plass, 1996; Huang & Liou, 2007), word pronunciation (e.g., Hsu, 2010), listening ability (e.g., Coniam, 2006), reading comprehension (e.g., Chun, 2006), writing skills (e.g., Chen & Cheng, 2008; Suh, 2002), and learning motivation or attitudes (e.g., Kern, 1995; Lin, 2009).

Many benefits are involved in CALL. CALL-based programs offer learners instant and easy access to a large amount of authentic materials in target language and allow greater learner control and self-paced learning which is independent of time and place (Suh, 2002). Learner control over learning encourages learner autonomy for independent learning and thus learners can make more efforts on the particular parts that seem more difficult to them (Adair-Hauck *et al.*, 1999; Beauvois, 1994; Lee, 2005). In addition, learners are provided with more interaction with engaging materials or tasks while exposing to CALL including extensive and multiple practice, immediate feedback with interactive reinforcement, and unlimited time for task completion (Lim & Shen, 2006; Murray, 1999). In terms of affective aspects, the integration of computer technologies through CALL programs can also help learners lower their anxiety about target language learning, increase their confidence and sense of achievement, and foster positive attitudes (Beauvois, 1994; Ushida, 2005; Wang & Wang, 2010). All the above mentioned advantages show that CALL applications could turn language learning into an engaging, interactive, and learner-centered process, thus promoting L2/FL learning.

### **The TOEIC test**

The Test of English for International Communication (TOEIC), a standardized test, is an English language proficiency test created by the Educational Testing Service (ETS) for nonnative speakers of English. The test uses the language of international business to measure examinees' ability to

understand English. The TOEIC test is a paper and pencil assessment using a multiple-choice format. It is divided into two sections (i.e., listening section and reading section) with each containing one hundred questions. The listening section testing how well examinees understand spoken English consists of four parts: Photographs, Question-Response, Conversations, and Short Talks. All questions relate to recorded materials. Examinees must listen to a variety of statements, questions, conversations, and talks recorded in English and answer questions based on what they have heard. The timing of each part of this section is controlled by the audio tape recording. A total of forty-five minutes are allotted for completing the listening section. The reading section testing how well examinees understand written English consists of three parts: Incomplete Sentences, Text Completion, and Reading Comprehension. All the information necessary to answer the questions is printed in the exam paper. Test takers read a variety of reading passages and respond at their own pace within seventy-five minutes, a time set for completing the entire reading section of the exam. The TOEIC test is scored on a scale of 10 to 990. Only correct responses are counted and converted to a TOEIC score (ETS, 2013). The format of the test is as follows (see Table 1).

**Table 1: The TOEIC test format**

Listening Section	Part 1	Photographs	10 items	45 minutes
	Part 2	Question-Response	30 items	
	Part 3	Conversations	30 items (10 conversations with 3 questions each)	
	Part 4	Short Talks	30 items (10 talks with 3 questions each)	
TOTAL			100 items	
Reading Section	Part 5	Incomplete Sentences	40 items	75 minutes
	Part 6	Text Completion	12 items (4 texts with 3 questions each)	
	Part 7	Reading Comprehension		
		• Single passages	28 items (7-10 texts with 2-5 questions each)	
	• Double passages	20 items (4 pairs of texts with 5 questions per pair)		
TOTAL			100 items	

### The present study

In Taiwan, nowadays, the standardized TOEIC scores are increasingly used in Taiwanese government institutions and some private enterprises as one of the promotion criteria, and are also used in numerous public and private schools/universities as a criterion for admission, placement or graduation. The present study applied computer technologies in regular classes to examine whether using the online TOEIC simulated-test system which provides unlimited accessibility, repeated practice, and result tracking could promote the TOEIC test performance in listening and

reading comprehension of a group of Taiwanese EFL (English as a foreign language) learners. Based on such a purpose, the research question was addressed: Does learning through the online TOEIC simulated-test system improve the test performance of the target learners in their listening and reading comprehension?

## **METHOD**

### **Participants**

52 students (native speakers of Mandarin Chinese, mean age = 20, male = 35 students, female = 17 students) taking part in the study were from one intact class and were studying Information Management in their second year at one technological college in Taiwan. The English proficiency of the students was at an elementary level according to their score results on the TOEIC pre-test administered at the beginning of the semester (see empirical analysis and results section). These students enrolled in the Advanced English course which was designed to familiarize students with the TOEIC test types, help students prepare for the TOEIC test, and enhance their listening and reading abilities to ultimately pass the English proficiency graduation threshold set for the students in the college to achieve upon the completion of the four-year college education. The required TOEIC score of the graduation threshold for the students majoring in the Department of Information Management was 350 points in the sum total with the lowest passing score of 175 points for either the listening test or the reading test, which is equivalent to CEF Level A2.

### **The online TOEIC simulated-test system**

The online TOEIC simulated-test system was set up on the web-server of the technological college (see Figure 1). Without limited accessibility, an individual student could use her/his own username and password to access it anytime and anywhere. A total of 12 units designed to simulate the actual timed, full-length TOEIC are involved in this online TOEIC simulated-test system (see Figure 2). Each unit contains two hundreds of practice questions organized by test part. Users need to listen and read questions on a computer screen and submit their answers online (see Figures 3 and 4). Time is allotted for online practice of each part, and the question orders change automatically upon each different access. The web tracking system records the exact time, date, and practice results of a user's each access (see Figure 5). Above all, the system allows users to repeatedly practice the questions of all units, track their test results, and check the answer keys and linguistic explanations through its web correction system as many times as they need (see Figure 6).

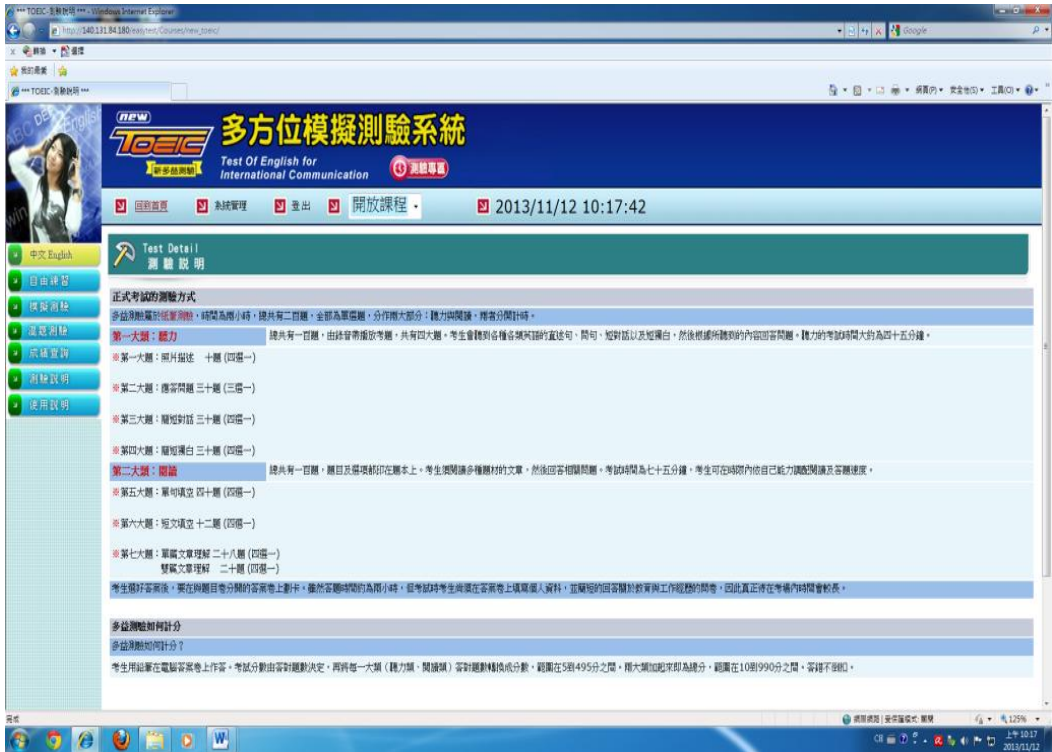


Figure 1: Screenshot of the homepage of the online TOEIC simulated-test system

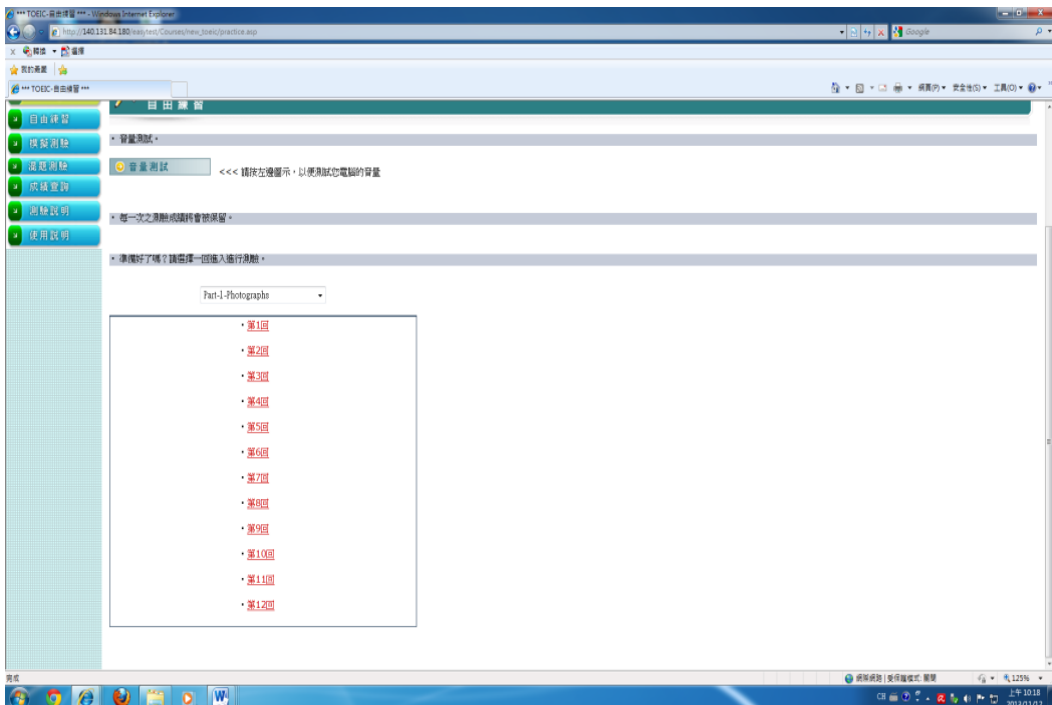


Figure 2: Screenshot of the 12 units involved in the system



Figure 3: Screenshot of a listening question (part 1 – Photographs) from the system

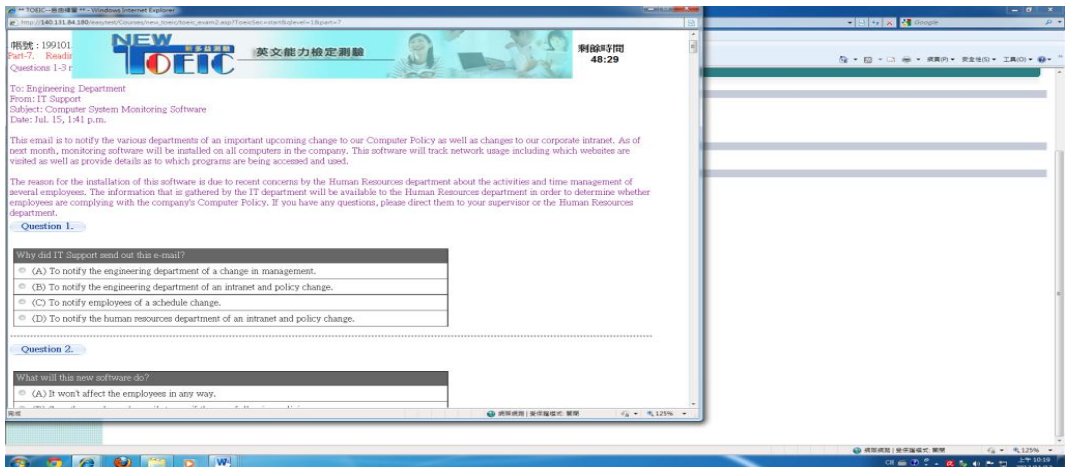


Figure 4: Screenshot of a reading text with the appended reading comprehension questions (part 7 – Reading Comprehension) from the system

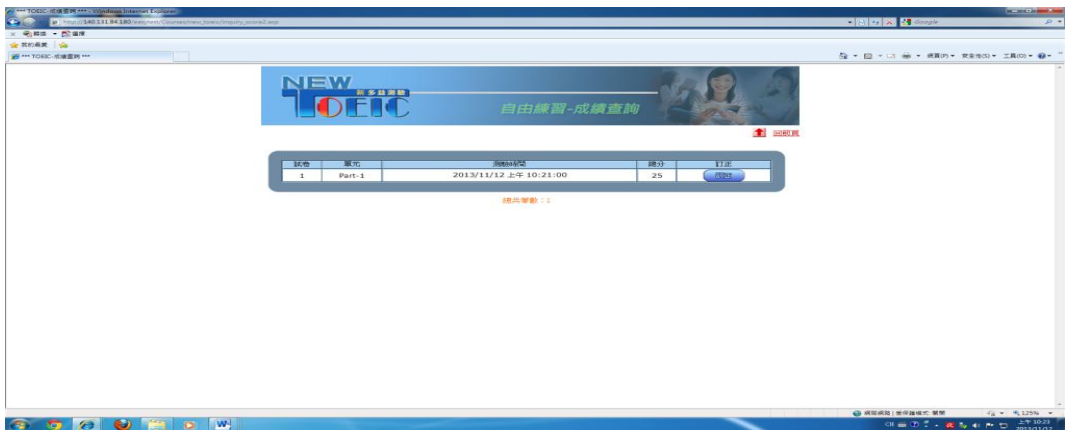
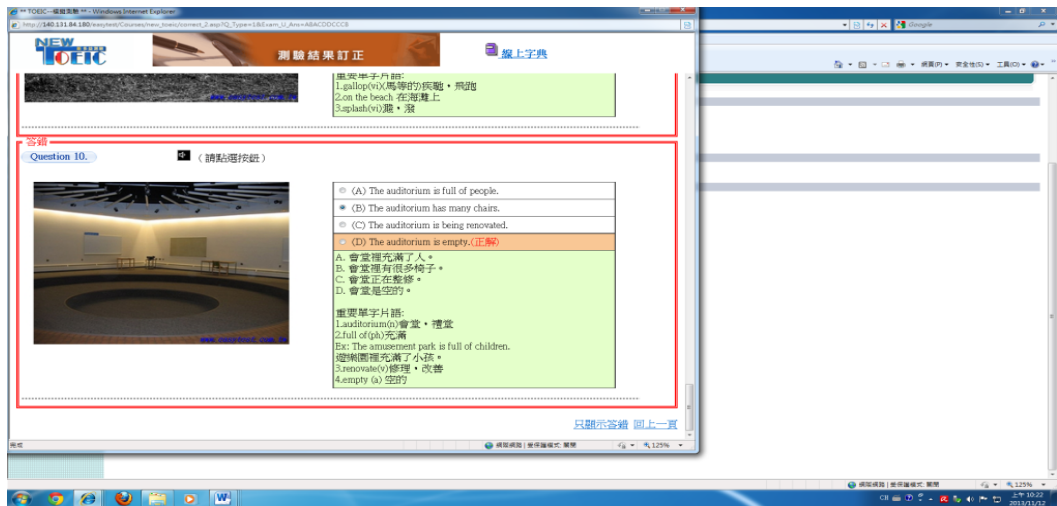


Figure 5: Screenshot of the web tracking system indicating the practice time, date, and result of one unit part



**Figure 6: Screenshot of the web correction system providing answer keys and linguistic explanations**

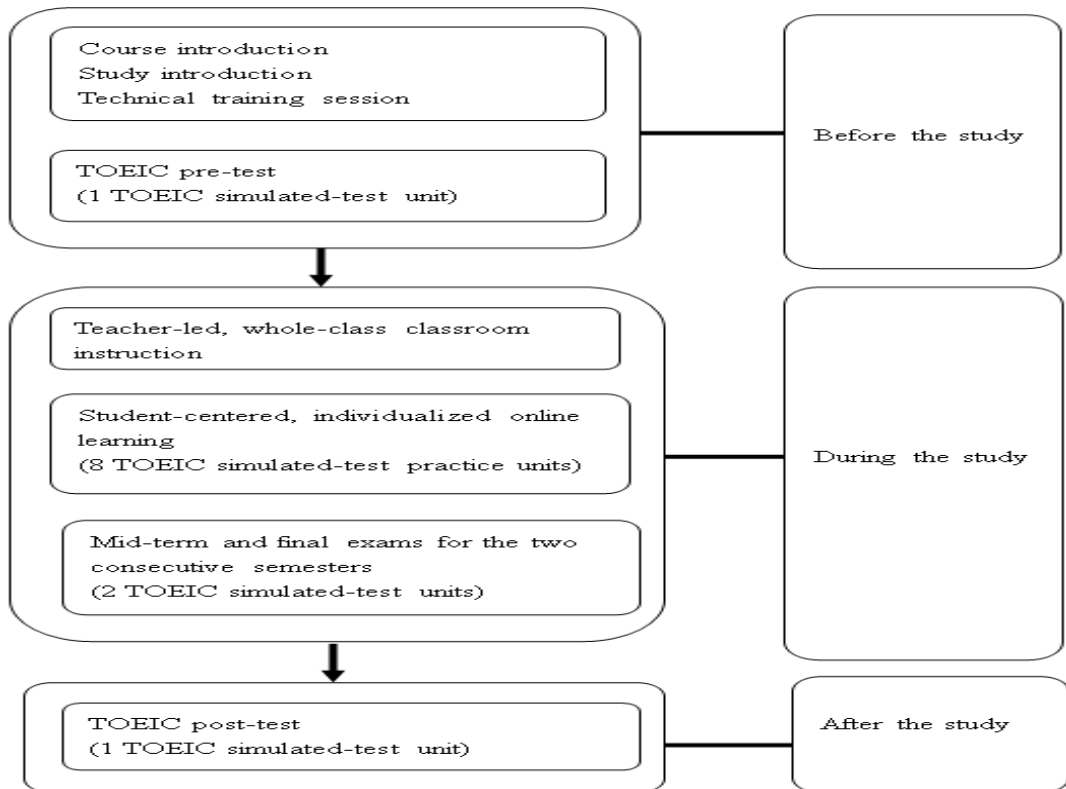
### Study procedure

Prior to the study, the participants were informed the study purpose of evaluating the effectiveness of the online TOEIC simulated-test system on listening and reading comprehension, the research procedure, and the confidentiality of the collected data. They were also offered a 20-min technical training session to become accustomed to the online system. Subsequently, they took the TOEIC pre-test, a simulated TOEIC test unit from the online TOEIC simulated-test system, for measuring their entry ability of English proficiency.

The course mentioned in the present study was offered once a week for two 50-min sessions over one academic year. The weekly class period consisted of one session of teacher-led, whole-class classroom instruction and one session of student-centered, individualized online practice. During classroom instruction sessions, the instructor-researcher analyzed the question types of each test part commonly found on the TOEIC, explained example questions in detail, and provided some test-awareness approaches or test-taking tips to help students become more aware of questions of different natures. During online learning sessions, students self-accomplished the scheduled unit parts through the online system at a language laboratory, and the instructor monitored students' online practicing and provided necessary help for technical problems. A total of 8 designated TOEIC simulated-test practice units from the system were used as course activities for the whole study with four weeks of practice time being assigned to complete one unit (or 7 unit parts). More specifically, unit parts 1 – 6 of each unit required a 3-week practice period (i.e., two unit parts per week) and the last part, reading comprehension part, needed to be completed in the fourth week.

After the study, one unit of TOEIC simulation test that students had never previously practiced serving as the post-test was administered to the participants on the last week of the second semester to assess learners' TOEIC test performance after using the online TOEIC simulated-test

system. Moreover, apart from the pre-and post-tests, students, in every semester, had to take the mid-term and final exams which were selected from the remaining two units with each containing only 50 listening questions and 50 reading questions. It should be noted that participants were not informed that they would be tested on listening and reading comprehension using the system in the post-test, mid-term exams, and final exams so that they would not intentionally do additional practice on the tested questions during the period of the study. Figure 7 illustrates the whole study procedure.



**Figure 7: Procedure of the study**

**Analysis**

Individual participants’ responses to the questions on the pre-and post-tests were marked automatically by the system with a potential maximum total score of 990 points. In addition, to examine whether there were significant improvements in participants’ listening and reading comprehension after one-academic-year of learning using the online TOEIC simulated-test system, the Paired-Samples T-Test was performed to compute the mean score differences in the pre-and post-tests. Also, to determine the size of the differences, effect size was calculated.

**EMPIRICAL ANALYSIS AND RESULTS**

As shown in Table 2, the mean scores increased from the pre-test (M = 139.90, SD = 23.379) to post-test (M = 173.65, SD = 21.943). Table 2 also indicated that the difference between the

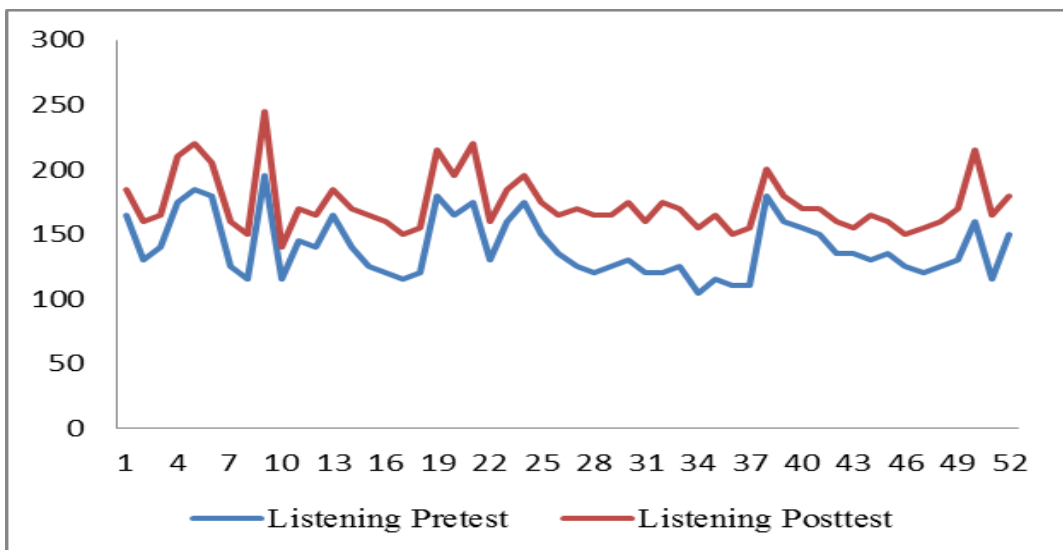


listening comprehension pre-and post-tests in mean scores compared using the Paired-Samples T-Test was statistically significant at the .001 level, demonstrating a significant level of progress on listening performance of the target learners who had practiced listening comprehension through the online TOEIC simulated-test system over a one-academic-year period. Also, effect size was computed and showed Cohen’s *d* value of 1.49, which was considered to be large. Accordingly, results of both Paired-Samples T-Test and effect size all showed that participants’ listening abilities improved substantially with the use of the online TOEIC simulated-test system, despite the fact that the mean score on the listening post-test was slightly lower than the required threshold value of 175 points for the TOEIC listening section. The comparison of participants’ scores on the listening pre-test and post-test is presented graphically in Figure 8.

**Table 2: Participants’ score results on the listening section**

Listening test	n	Mean	SD	t	p
Pre-test	52	139.90	23.379	-23.449	.000**
Post-test	52	173.65	21.943		

\*p < .01 \*\*p < .001



**Figure 8: Comparison of the listening pre-test and post-test scores**

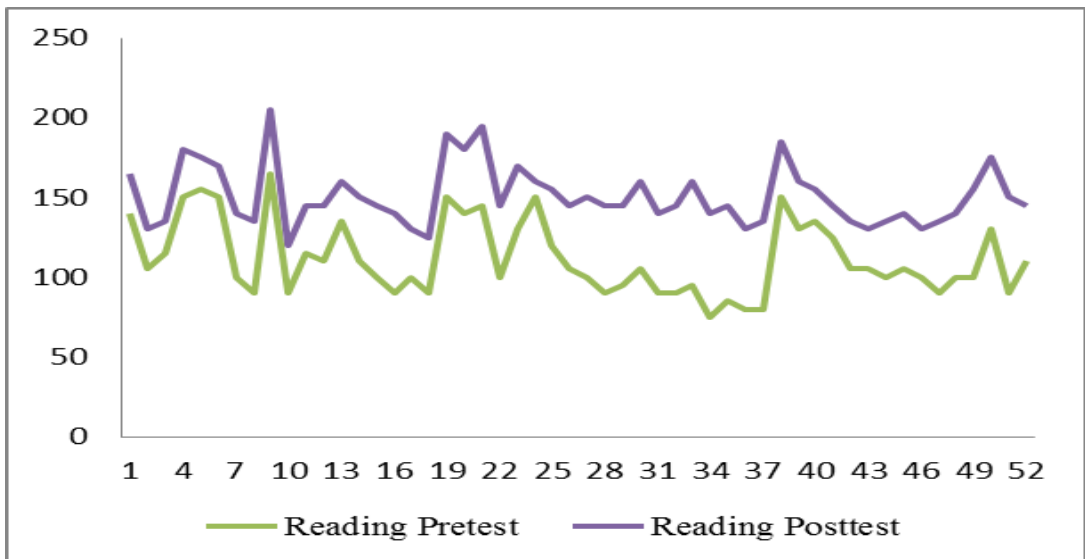
On the other hand, Table 3 revealed that participants improved their overall reading comprehension with an increase of 39.14 points in mean score gained in the post-test, which means that participants made an average improvement of about 39 points on their reading post-test scores after practicing reading via the online TOEIC simulated-test system for one academic year. Although the learners’ performance seemed unsatisfactory at first glance (i.e., the mean score ( $M = 150.87$ ) in the reading post-test was not as high as the one ( $M = 173.65$ ) in the listening post-test), the progress in reading was still significant. As shown in Table 3, the significant gain ( $t = -21.813, p < .001$ ) was achieved by the participants with a mean score 111.73 and standard deviation 23.219 in the reading pre-test and 150.87 ( $SD = 18.910$ ) in the post-test. In addition, its

effect size was large (Cohen’s  $d = 1.85$ ), suggesting that learning through the online TOEIC simulated-test system had a facilitating effect on reading performance of the target learners. However, the mean score in the reading post-test did not reach the required passing score of 175 points set for the TOEIC reading section. Figure 9 provides a graphic summary of the reading pre- and post-test score results.

**Table 3: Participants’ score results on the reading section**

Reading test	n	Mean	SD	t	p
Pre-test	52	111.73	23.219	-21.813	.000**
Post-test	52	150.87	18.910		

\*p < .01 \*\*p < .001



**Figure 9: Comparison of the reading pre-test and post-test scores**

The fact that the differences in both listening and reading test scores were statistically significant with large effect sizes revealed that learners benefited from exposing to the online TOEIC simulated-test system to improve their test performance. Nevertheless, while participants greatly advanced in their listening and reading abilities, the post-test mean score in either listening test or reading test still did not cross the demanded English proficiency threshold, implying that students might need more practice and that their listening and reading skills should be further developed, particularly for the skills of reading. The study thus suggests the need for the incorporation of explicit strategy training into such test preparation courses.

## CONCLUSIONS

The study investigated how well the participants promoted their TOEIC test performance using the online TOEIC simulated-test system. The results of the study revealed that after one academic year of exposure to the online TOEIC simulated-test system, learners with lower-level EFL

proficiency significantly improved their TOEIC test performance in terms of listening and reading comprehension despite the failure to meet the demand for the graduation threshold. Overall, the study demonstrated that CALL-based instruction can facilitate second/foreign language listening and reading, and thus the study findings support the existing evidence that CALL serves a useful role in L2/FL learning (e.g., Akbulut, 2007; Chen & Cheng, 2008; Hsu, 2010; Huang & Liou, 2007; Wang & Wang, 2010). This study also provides suggestions to Taiwanese language instructors who are encouraged to use a CALL component in classroom instruction either in the form of computer-mediated instruction or blended approaches that combine computer-based applications with face-to-face teaching to expose learners to effective language learning.

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