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Pedagogical effects of teaching test-taking strategies to EFL college students

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Abstract

This study, an 18-week comparative experiment, examined the effects of instruction in test-taking strategy in English as a foreign language reading class. It involved an experimental group (68 students) taught test-taking strategies and a control group (66 students) that did not receive the instruction. Various means were used to investigate the pedagogical efficacy of the instruction of test-taking strategies. First, standardized reading tests revealed both groups' reading comprehension performance for comparison before and after the experiment. Second, the effects of test-taking strategies on the experimental group were surveyed before and after the intervention. Third, the experimental group discussed perceptions regarding the intervention. Results show that the experimental group significantly outperformed the control group in the reading tests, had significantly better test-taking strategies, and strongly endorsed the usefulness of the instruction in test-taking strategy. This paper concludes with recommendations for teaching test-taking strategies to empower students to tackle reading tests.

Keywords: test-taking strategies, reading instruction, reading tests, reading strategies, standardized reading tests

Reading strategies have a highly important role in our literate society (Alderson, 2000, 2010). They are not only necessary for students to achieve academic success (Joh & Schallert, 2014; Metsäpelto et al., 2017) but they are also key components of foreign language learning and even of lifelong learning (Bernhardt, 2005; Grabe & Stoller, 2013; Sheorey & Mokhtari, 2001; Uso-Juan, 2006). Given this importance, numerous scholars over the years have considered a number of related issues (cf. Chen, 2017; Grabe & Stoller, 2014). For example, researchers have found that from cognitive factors aside, some readers outdo others in processing foreign language texts (Zhang, Goh, & Kunnan, 2014). One of the key differentiating variables in readers is their use of reading strategies. The use of such strategies can compensate for insufficient language knowledge or unsatisfactory reading comprehension performance (cf. Canale & Swain, 1980; Karimi, 2015). Studies have commonly reported how the effective use of reading strategies generally leads to reading comprehension (e.g., Chang, 2010; Grabe, 2009; Schwartz, Mendoza, & Meyer, 2017). The importance of employing a reading strategy has thus fostered studies on foreign language reading, encouraging the teaching of reading strategies (Akkakoson, 2013; Barnett, 1988; Karimi, 2015; Macaro & Erler, 2008; Manoli, Papadopoulou & Metallidou, 2016).

While reading strategies aim at facilitating reading comprehension in general (Chen, 2017;

Schwartz et al., 2017), test-taking strategies are "test-taking processes which the respondents have selected and which they are conscious of" for tackling the specific tasks set in tests (Cohen & Upton, 2006, p. 4). In the domain of language assessment, test-taking strategies are also found to correlate positively with language-testing performance, making it easier for respondents to understand what to do in reading tests (Huang, 2016; Phakiti, 2003; Zhang et al., 2014). Gebril (2018) concluded from the literature that test-taking strategies can help students score better in tests. However, while many accounts support instruction in reading strategies (e.g., Akkakoson, 2013; Chen, 2017; Karimi, 2015; Manoli et al., 2016; Schwartz et al., 2017; Zhang, 2008), studies exploring specific instruction in test-taking strategies in the context of foreign language reading are still relatively few (Chalmers & Walkinshaw, 2014; Cohen, 2006; Plonsky, 2011). As Plonsky observed, few papers address the issue of instruction in test-taking strategy for prospective respondents to standardized tests. Additionally, while some studies quantitatively reported students' reactions to instruction in reading comprehension strategy (e.g., Barnett, 1988; Macaro & Erler, 2008; Manoli et al., 2016), in-depth qualitative inquiries into students' perceptions of such instruction are infrequent. In light of this, the present researcher argues that more qualitative inquiries are needed in the field because they may generate different evidence from which to judge the pedagogical suitability of the strategy instruction in reading classes and material for instructional frameworks in general.

With other studies being sparse, this empirical study thus sought to assess the pedagogical effects of test-taking strategies instruction on Taiwan's English as a Foreign Language (EFL) student readers. Three research questions were thus formulated to reflect this aim:

1. What are the effects of instruction in test-taking strategy on students' reading performance in standardized tests of reading achievement?
2. What changes are made in students' use of test-taking strategies after they have received instructions in test-taking strategy?
3. What are students' learning attitudes to instruction in test-taking strategy?

These questions will be answered with this study, which entailed teaching an experimental group (EG) of Taiwanese undergraduates a set of test-taking strategies and comparing their reading scores with that of a control group (CG). Additionally, the EG's use of a test-taking strategy before and after this experimental treatment was quantitatively assessed by a survey. The quantitative outcome was then complemented with a qualitative inquiry into their experience of learning to use test-taking strategies.

Literature Review

Reading Strategies

One of the most discussed topics in research on reading in a foreign language is reading strategies (e.g., Barnett, 1988; Brantmeier, 2005; Chen, 2017; Price-Mohr & Price, 2017; Uhrig, 2015), conceptualized as "intentional actions chosen to facilitate reading at any level of processing" (Erler & Finkbeiner, 2007, p. 189). In other words, reading strategies are "conscious techniques and tactics deliberately employed by a reader for successful reading" (Rupp, Ferne, &

Choi, 2006, p. 447). Readers use these strategies to a greater or lesser extent to build meaning from texts. Researchers have also looked at reading strategies as a means for "provid[ing] … insights as to how readers interact with the text and how their choice of strategies influences their comprehension of the text" (Cohen & Upton, 2007, p. 211).

A number of studies have explored learners' reading strategies for processing written texts and examined the specific interaction between these strategies and proficiency levels (e.g., Akkakoson, 2013; Barnett, 1988; Phakiti, 2016). In particular, experts have scrutinized the processing skills and strategies for reading comprehension among successful language learners, in the hope that poorer students can learn from better readers' strategies. Poor readers are assumed to use reading strategies to compensate for their lack of EFL reading comprehension, in the belief that such strategies will ultimately improve their ability to read in the target language and comprehend what they are reading (Akkakoson, 2013; Lee, 2011; Stanovich, 1980). Many scholars have also suggested that effective reading strategies should be taught to student readers to maximize their reading comprehension (Block, 1992; Chen, 2017; Grabe, 2009; Wu, 2005).

Reading-strategy instruction is based on the premise that strategies are teachable and that developing new processing strategies benefits student readers (Plonsky, 2011; Schwartz et al., 2017; Wichadee, 2011). The results of research on strategy instruction for comprehension have generally found that learners can improve by learning to monitor their reading processes. For instance, Salataci and Akyel (2002) looked into the instructional effects of multiple reading strategies on a group of EFL college students in a Turkish university. Their study generated evidence in favor of such strategic instruction because after the instruction their participants improved both in the use of reading strategies and in reading comprehension performance. Likewise, Zhang (2008) taught strategy instruction for eight weeks to 99 Chinese-speaking EFL undergraduates. He found that the strategic training positively changed the participants' strategic behaviors and improved their reading comprehension. Similar findings can also be seen in the study by Akkakoson (2013), who observed a relationship between strategic reading instruction and reading achievement among Thai university students compared pre- and posttest, with the experimental cohort outperforming the control cohort in reading outcomes and the employment of strategies. The higher-level readers used strategies more effectively than the others did.

Test-taking Strategies

Researchers have also considered test takers' strategies for language problems as aspects of assessment (Cohen, 2006; Cohen & Upton, 2007; Phakiti, 2016; Rupp et al., 2006; Zhang et al., 2014). The common belief about this practice is that "providing [students] with test-taking strategies can help them improve their test performance" (Gebril, 2018, p. 13). This is because test-taking strategies can empower test takers to cope with both language issues and the item-response demands in tests (Cohen, 2006). Strategies also help students to "know things that are unrelated to what is actually being tested" (Winke & Lim, 2017, p. 381), such as noticing patterns in test items or allocating different lengths of time to different test sections/items.

Cohen and Upton (2006), for example, examined the test-taking strategies for familiarizing respondents with the TOEFL iBT exam. For the Basic Comprehension-vocabulary item, the most frequent strategies included jumping immediately to a word before looking at the options or

reading the passage carefully. Searching the passage for clues and eliminating incompatible answers were common in Basic Inference items. In other words, the TOEFL iBT reading can be viewed as a test of test takers' ability to use skills in basic academic reading combined with skills in test-taking for varied quasi-academic reading tasks. Similarly, Zhang et al. (2014) investigated the relationship between the cognitive and metacognitive strategies used by candidates in an EFL test. They found that test takers' use of strategies had a significantly positive impact on their reading test ability. Their result lends support to an earlier study by Phakiti (2003). In his study, Phakiti looked at the relationships between test-taking strategies and the performance of 384 test takers in a reading achievement test. Phakiti (2003)'s result also confirmed a positive correlation between test-taking strategies and reading test performance. Variety in every aspect characterizes the range of these studies.

Research has shown that test-taking strategies are highly approved of for their effects on enabling students to deal with tests. However, test-taking strategy instruction for candidates in standardized tests has rarely been investigated (Cohen, 2006). Although strategy instruction is context-dependent (Plonsky, 2011), no previous studies have focused on investigating instruction in test-taking strategy in the context of TOEIC (The Test of English for International Communication) in particular. Consequently, an experimental teaching situation using TOEIC test-taking strategies was prepared. This study was intended to help close the above gap by investigating the impact of instruction in test-taking strategies on a reading comprehension test.

Method

Participants

This study was part of a larger experimental research project at a comprehensive university in northern Taiwan. In this study, all the second-year students took the same English course (*English II*). This study used the convenience sampling method (Dörnyei, 2007) to recruit from the researcher's two English reading classes a total of 134 students, who used the same reading materials and whose reading achievement was measured by reading tests.

All of these students formally consented to take part, but this may still pose some ethical challenges that could affect the results of the study in question. For example, since the researcher who asked them to participate was also their teacher, some participants might have been influenced by such affective factors as trust in her and thus, develop a stronger sense of approval of the treatment they were to receive than was objectively justified. Likewise, pressure from the authority of the teacher over the participants might have compelled them to agree to the effectiveness of the treatment more warmly than they would have without it.

The participants were randomly assigned to an EG or a CG. The EG comprised 68 students from the university's College of Business, majoring in international business (8 students), banking and finance (24 students), economics (19 students), insurance (10 students), and others (7 students). The CG had 66 students majoring in mass communication (13 students), information and library science (18 students), educational technology (9 students), history (11 students), information and communication (11 students), and others (4 students).

It should be noted that the university policy for the experimental site assigned the second-year students to reading classes on three levels based on their English proficiency. This was determined by the total (100%) of students' grades in a unified standardized English test (60%) and their scores (40%) for a course in the previous year (*English I*). The benchmarks were set at high (80 and above), intermediate (60-79) and low (59 and below). The two classes involved in this study were both of high level.

Research Instruments

This study used three research instruments: two TOEIC reading comprehension tests examining participants' reading performance, a questionnaire eliciting their use of test-taking strategies, and an interview about their learning experience.

TOEIC reading tests. The test used for this study was the TOEIC. This is a standardized English-language proficiency test for non-native English speakers (Choi, 2008; Hsieh, 2017) and had been chosen by this particular university as one of the standardized English-language tests that students had to pass in order to graduate. TOEIC measures English skills in an international environment (Educational Testing Service, ETS, 2019). The score indicates how well test-takers can communicate about everyday work activities in English. Following several years of ETS research, the TOEIC was revised. Its new version has redesigned reading and listening sections reflecting current theories of communicative language use. In the reading section, 100 multiple-choice questions measure three areas: Sentence Completion (40 questions); Text Completion (12 questions); and Reading Comprehending in single and double passages (28 and 20 questions respectively).

Test samples for TOEIC reading comprehension produced by the ETS are available on request for researchers. However, the present study, constrained by time and resources, modified them somewhat, splitting the ETS material into two different versions with equally difficulty items, as discussed and chosen with the guidance of testing experts. Each split sample contained 20 questions on Sentence Completion, 6 on Text Completion, and 24 on Reading Comprehension. With the reduced total, the time allocation dropped to 40 minutes. Finally, the versions were randomly assigned either to a pretest or a posttest.

Strategy questionnaire. The questionnaire (Appendix A) used a 5-point Likert scale, examining the frequency of use of 24 test-taking strategies by the EG. These were strategies that Lee (2018) had used to help another group of Taiwanese students take a TOEIC reading test. The 24 items were divided into four groups, depending on their strategy. Category 1 was word-based/lexico-grammatical (six items), measuring individual word recognition and grammatical usage. Category 2 was sentence-based (five items), measuring the critical information aggregated from different parts of sentences. Category 3 concerned reading comprehension (eight items), which focused on the ways in which students read and comprehended the texts. Category 4 contained technical strategies (five items), which measured the overall approaches to optimizing performance across all TOEIC questions. Additionally, a pilot study of 120 students from neither the present nor the previous study groups determined the quality of the questionnaire, which was found to be highly reliable (Cronbach alpha = .85) (cf. Wu & Tu, 2005, 2009). It should be noted that the questionnaire was designed, examined, and delivered in Chinese, the participants' first

language, and then translated into English for presentation and discussion in this paper.

Interview. To complement the quantitative survey of a feature lacking in the current literature, the participants' self-reports of strategy use (cf. Huang, 2016; Macaro & Erler, 2008; Manoli et al., 2016), 36 EG volunteers were interviewed for qualitative accounts of their perspectives on/perceptions of the test-taking strategies and the instruction in them. Primarily, the questions concerned how the students felt about and perceived the treatment. They were also asked to reflect upon their experience of using the test-taking strategies in the TOEIC tests before and after the experiment. To ensure that the interviews went effectively, an interview guide (Appendix B) by the researcher herself was used. Additionally, for clarification, seven open-ended questions (Appendix C) supplemented the solicited data. The interviews each lasted approximately 30 minutes and were in Chinese to foster free expression. The interviews were digitally recorded and then transcribed for data analysis.

Procedure

The participants met weekly for 18 weeks of two-hour English reading classes. The first hour for the EG was devoted to instruction in test-taking strategy and the second to original reading material designated by the university. Altogether, the experimental treatment took 16 hours over 16 weeks. In contrast, the CG were taught no particular test-taking strategies but were taught solely the assigned reading material over their 16 weeks. Data were collected at three stages: pre-instruction (Week 1), during instruction (Weeks 2-17), and post-instruction (Week 18) (see below).

In Week 1, the TOEIC reading test was first delivered to both the EG and CG to check for any significant differences of English proficiency between them. The EG alone then completed the strategy questionnaire on their pre-treatment use of test-taking strategies.

From Week 2 until Week 9, the EG received strategy instruction. Every strategy was explicitly taught and explained in detail, with teacher guidance, before students applied the strategies they had learned to the sample TOEIC questions (different from those in the pre- and posttests) provided by the researcher. Weeks 2 and 3 were spent on the test-taking strategies of Strategy Category 1; Weeks 4 and 5 on Strategy Category 2; Weeks 6 and 7 on Strategy Category 3; and Weeks 8 and 9 on Strategy Category 4.

From Weeks 10 through 17, the instructor changed roles from knowledge provider to facilitator. The TOEIC reading questions were again used as examples for the EG to practice strategies that they had learned in Weeks 2-9. During practice, the students were divided into groups to share and discuss their strategy use. The peer discussion aimed to develop students' metacognition in making decisions about using strategies. After the discussion, the instructor invited students to share the strategies used for each question and offered suggestions and comments as appropriate.

During the 16 weeks, the hour without experimental treatment for the EG–like both hours for the CG–was devoted to teaching the reading material prescribed by the university, namely, Active 4: Skills for Reading (Anderson, 2014). The time was mostly used for explaining the material and highlighting the main ideas, language use, and vocabulary of its articles.

Finally, in Week 18, the TOEIC reading posttest was taken by both groups and the strategy questionnaire was administered again to the EG alone. This was also the week for the interviews.

Data Analysis

Quantitative Analysis. First, to ensure homogeneous English proficiency before the experiment, the pre-TOEIC scores were run with an independent sample t-test to check for differences between the groups. Second, paired sample *t* tests were separately performed on the groups to ascertain whether their reading performance changed after the experiment. For both *t* tests, effect sizes were reported using Cohen's *d* (cf. Field, 2009). Third, an ANCOVA (analysis of covariance) examined any differences between the TOEIC posttest scores of the groups, using the TOEIC pretest scores as a covariate. ANCOVA was used instead of repeating another independent t-test, since it was thought to more accurately assess the effect of grouping on dependent variables. This was done with ANCOVA because it could statistically balance out the difference between groups before the treatment. Controlling such a difference (i.e., a covariate) was important because it might influence the dependent variables although it was not influenced by the experiment (Field, 2009; Leech, Barret, & Morgan, 2008). The effect size of the ANCOVA result was determined using partial eta^2. Finally, both descriptive statistics and a paired-sample *t* test determined the results of the strategy questionnaire to elicit the frequency changes in test-taking strategy use by the EG students before and after the treatment.

Qualitative analysis. The interview transcripts were first coded by the researcher and two of her colleagues. The coding focused on participants' perceptions and perspectives regarding the test-taking strategies taught to them and the learning experience during the treatment. Specifically, the feedback on the effectiveness of test-taking strategies and the instruction, regardless of positivity or negativity, were all marked. After coding, the coders discussed and justified their codes. The inter-rater agreement between the coders in the final coding was 89%. To clarify ambiguities, any discrepancies in the coding were discussed in a joint review by the researcher and another experienced reading instructor.

Results

Research Question 1

The first research question concerned the effects that instruction in test-taking strategy might have on students' reading performance. To answer this question, a series of statistical tests was performed.

First, as Table 1 shows, no statistical difference was found between the groups regarding their pretest TOEIC scores (t (132) = -.99, p = .327, d = .19), suggesting similar levels of reading achievement at entry.

Table 1. *Independent t-test for the pretest TOEIC scores of the groups*

Item	Group	*N*	*M*	*SD*	*df*	*T*	*p*	*d*
Pretest	Experiment	68	39.29	3.47	132	-0.99	0.327	0.19
	Control	66	39.83	2.83				

Second, Table 2 shows a statistically significant difference for the EG before and after the treatment (t (67) = -9.49, p = .000), with a large effect size (d = .88). However, a non-statistically significant difference was found for the CG (t (66) = 1.21, p = .230, d = .16). This means that the improvement by the EG was not random, but ascribable to the experimental treatment.

Table 2. *Pair-sample t-tests on the pre- and posttest TOEIC scores of the groups*

Group	Item	N	Mean	SD	*df*	*t*	*p*	*d*
EG	pretest	68	39.29	3.47	67	-9.49	0.000	0.88
	posttest	68	42.35	3.14				
CG	pretest	66	39.83	2.83	66	1.21	0.230	0.16
	posttest	66	39.39	2.69				

In addition to the improvement found, the differences between the groups on the posttest TOEIC scores were also found to be statistically significant through ANCOVA, suggesting that the strategy instruction was indeed able to help the EG gain significantly in reading test performance. To be precise, while Table 3 shows the adjusted and unadjusted group means in the posttest, Table 4 presents the significant effect made on Group, F (1, 131) = 61.05, p = .000, with a large effect size of partial eta^2 (.318).

Table 3. *Adjusted and unadjusted group means and variability found in posttest TOEIC scores, using pretest scores as a covariate*

Group	N	Unadjusted		Adjusted	
		Mean	*SD*	Mean	SE
Experiment	68	42.35	3.14	42.50	0.29
Control	66	39.39	2.69	39.25	0.30

Table 4. *ANCOVA Analysis for posttest TOEIC scores as a function of group, using the pretest TOEIC scores as a covariate*

Source	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.	Partial eta^2
Corrected Model	673.92	2.00	336.96	58.65	0.000	0.472
Intercept	325.51	1.00	325.51	56.66	0.000	0.302
Pretest TOEIC Scores	380.67	1.00	380.67	66.26	0.000	0.336
Group	350.75	1.00	350.75	61.05	0.000	0.318
Error	752.62	131.00	5.75			
Total	225534.00	134.00				
Corrected Total	1426.54	133.00				

Research Question 2

The second research question asked what changes were made in students' use of test-taking strategies after they had had the experimental treatment. To answer this question, the results of the strategy questionnaire before and after the instruction were first reported through descriptive statistics and then examined using paired-sample t-tests.

First, the results of descriptive statistics show a consistent increase in the reported use of strategies over the semester (see Table 5). Only the use of Strategy 10 (*jumping immediately to the part that contained the missing word*) remained the same. Additionally, the frequency of using Strategy 6 (*figuring the target vocabulary by focusing on its prefixes or suffixes*) and Strategy 13 (*skimming the passage to note the chief points before reading the questions*) decreased. This suggests that the treatment had an effect on the participants' patterns of use of the test-taking strategies.

Table 5. *Descriptive statistics for each item in the questionnaire*

Category:	Strategy	Pretest		Posttest	
		Mean	SD	Mean	SD
Category 1: Word-based/lexico-grammatical strategies	Strategy 1	3.49	0.94	4.18	0.93
	Strategy 2	3.69	0.76	4.13	0.77
	Strategy 3	3.54	0.80	4.03	0.81
	Strategy 4	3.38	1.27	3.87	0.94
	Strategy 5	3.50	0.92	3.81	0.87
	Strategy 6	3.82	0.81	3.53	1.03
Category 2: Sentence-based strategies	Strategy 7	3.25	1.26	4.38	0.60
	Strategy 8	3.26	1.22	3.41	0.86
	Strategy 9	3.18	0.99	3.54	0.98
	Strategy 10	3.57	0.95	3.57	1.03
	Strategy 11	3.62	1.13	4.05	0.83
Category 3: Reading comprehension strategies	Strategy 12	3.00	1.07	3.99	0.97
	Strategy 13	3.60	1.04	3.07	1.10
	Strategy 14	3.62	0.86	4.18	0.91
	Strategy 15	3.51	0.86	4.00	0.75
	Strategy 16	3.54	0.76	3.85	1.07
	Strategy 17	3.96	0.85	4.10	0.90
	Strategy 18	3.28	1.03	3.65	0.91
	Strategy 19	3.15	1.19	3.49	0.95
Category 4: Technical strategies	Strategy 20	4.23	0.86	4.24	0.74
	Strategy 21	4.05	0.82	4.16	0.80
	Strategy 22	3.63	0.93	3.60	1.02
	Strategy 23	3.34	0.84	3.51	0.98
	Strategy 24	3.75	0.92	4.04	0.87

Supporting the results of the descriptive statistics, Table 6 shows an overall statistically significant difference (t (67) = -4.88, p =.000), with what nearly approached a large effect size (d = .70). Further, statistically significant effects were found in Strategy Category 1 (t (67) = -3.69, p =.000), Strategy Category 2 (t (67) = -4.57, p =.000), and Strategy Category 3 (t (67) = -3.59, p =.000), with medium to large effect sizes (d = .50, .68, and .54, respectively). However, Strategy Category 4 had a nearly marginally significant effect (t (67) = -1.94, p =. 057), with a small effect size (d = .22). The results show significant changes when the students took the TOEIC test in patterns of strategy use, owing to the treatment. Such changes are particularly observable for Strategy Categories 1-3.

Table 6. *Paired-sample t tests for the questionnaire entry and exit scores of the groups*

Item	Test	N	Mean	*SD*	*df*	*t*	*p*	*d*
Overall questionnaire	entry	68	84.47	11.40	67	-4.88	0.000	0.70
	exit	68	92.47	9.74				
Category 1: Word-based/lexico-grammatical strategies	entry	68	21.43	4.20	67	-3.69	0.000	0.50
	exit	68	23.54	3.47				
Category 2: Sentence-based strategies	entry	68	16.88	4.24	67	-4.57	0.000	0.68
	exit	68	19.75	2.29				
Category 3: Reading comprehension strategies	entry	68	27.66	4.52	67	-3.59	0.001	0.54
	exit	68	30.12	3.81				
Category 4: Technical strategies	entry	68	18.50	2.46	67	-1.94	0.057	0.22
	exit	68	19.06	2.56				

Research Question 3

This research question concerns learner attitudes to explicit instruction in test-taking strategies. In the interviews, the respondents from the EG commented favorably with positive attitudes and feelings toward the instruction in test-taking strategy, echoing the positive quantitative results.

First, the participants gave favorable feedback overall on their learning experience with the instruction. Explicitly, the great majority of the interviewees described the learning experience as "fresh," "new," and "interesting," particularly in comparison with their past learning experience. The following three specific student comments are especially clear:

> It's the first time that I experienced this kind of teaching in the English class, very different from my past English learning experiences. (Student A)
>
> I took the TOEIC test before, but I have never learned so much about these test-taking strategies or been taught how to practice these strategies. (Student B)
>
> In high school or previous freshman English classes, the teacher mostly focused on textbooks and asked us to note down important vocabulary or grammatical points from the articles. (Student C)

Besides seeming innovative, the strategy instruction was "*practical*" and "*effective*," according to the respondents. Almost all of the interviewees (n = 33) stated that the test-taking strategy training improved their ability to take multiple-choice reading comprehension tests in general and TOEIC reading tests in particular. The interviewees greatly valued the practicality of the instruction in test-taking strategy and recommended it for inclusion in English reading classes. The specific statements below encapsulate feedback from many others elaborating this verdict:

> I think this instruction in test-taking strategy is very practical; it is very effective for tests, too. You see, we (students here) ultimately have to take the TOEIC tests, either for meeting graduation benchmarks or applying for jobs in the future. (Student D)

> … after this strategy instruction, we know this (the reading test) relies not only on English proficiency, but also [test-taking strategies] so as to get good grades… I hope to learn more about similar lessons. (Student E)

Supportive comments on the strategy instruction are also found in the precise accounts for each set of test-taking strategies. In general, the EG participants remarked that they had become more strategic in using test-taking strategies for TOEIC questions. In detail, the interviewees positively assessed most of the test-taking strategies included in the four categories. In Category 1, Student F's response shows a common student belief about strategies *(the understanding of vocabulary used to select an answer*):

> I understand all of the words in the questions and options, so I can identify the missing word easily. I think understanding of the vocabulary words is the fundamental skill for answering this type of question. (Student F)

Student G similarly offered common student feedback on the effectiveness of Strategy 2 (*identifying the word form by considering the options*) and Strategy 3 (*identifying the word tense voice*). In her account, Student G reported approval of the specific test-taking strategies she had learned:

> I think I used many strategies related to English grammar and word tenses … for example, I need an adjective here (referring to a particular question), so I can tell it should be "necessary" instead of "necessity", "necessitate" or "necessarily. (Student G)

Although students' use of test-taking strategies in Category 1 improved in general, the quantitative use of Strategy 6 (*figuring out the target vocabulary by focusing on its prefixes or suffixes*) alone decreased after the treatment. A possible explanation came from Student H:

> Strategy 6 sounds interesting and helpful, but I was still afraid that I would deduce the wrong meaning from its prefix or suffix. The problem is that I don't think I have enough vocabulary bank to make the correct deduction. But I will try to learn more about prefixes and suffixes to help me guess word meanings when encountering unknown words in the future. (Student H)

Interviewees also found themselves more capable of using the strategies in Category 2 to find the most answers correctly. As detailed, they could now employ the strategies to combine pieces of information from different parts of sentences to draw intertextual inferences across from them as a whole. Specifically, Student I said that he would use Strategy 7 (*using the understanding of the overall context meaning to infer the correct option)* with Strategy 8 *(taking advantage of semantic clues)* to judge the correct option, which was a common practice also reported by other interviewees. Student J further remarked how these two strategies helped him interpret the unknown parts by incrementally integrating the overall meaning of a given string of words. Student H's account below serves as a widespread comment regarding participants' actual practice of the test-taking strategies learned:

> When I found the sentence which contained the question, I would now first locate the key words or phrases in a previous or later part … like, when noticing particular pieces of information in a sentence, I would either look for the most closely related options or judge what options were irrelevant to the information given in the sentence. (Student H)

Notable strategy trends for Category 3 were also reported in the interview accounts, in which interviewees described how they learned to use reading comprehension strategies to help answer the reading comprehension section. This includes *rereading a portion of the passage carefully if it seems to contain a possible answer* (Strategy 15*), reading the question before looking for clues in the related text* (Strategy 14), and *matching the key word in the question/options to the text* (Strategy 17). Student K's illustration is representative of the shared feedback:

> After the instruction, I realized that the key point in answering TOEIC tests is to locate important parts from the texts. Whether I finish reading the texts is not important; it is to answer as many questions correctly as possible. For example, I now read the questions first and then use the questions to extract key points from the texts, usually by skimming. (Student K)

The EG had only a statistically marginal gain in using test-taking strategy Category 4, but qualitative accounts offer a possible reason. As the interviewees explained, before the instruction they had learned some of the techniques in senior high school. Two techniques particularly commonly addressed by students were Strategy 20 (*using the process of elimination to approach an answer*) and Strategy 21 (*when struggling with answer options, focusing on the parts which might contain potential answers*). Student L elaborated on this:

> I learned to use [Category 4] strategies when I was in high school. For example, the process of elimination in the multiple-choice format was always emphasized for the class to achieve better marks. When demonstrating effective ways to answer difficult questions, my English teacher almost always taught the class to focus on the main question information, and to ignore the irrelevant parts. So I was familiar with these strategies before the instruction. (Student L)

Despite background familiarity, most of the participants interviewed acknowledged that instruction in test-taking strategy still helped them grow more confident in using the strategies in Category 4, deeming them effective. In particular, with the combination of strategies from other

categories, participants demonstrated more strategic knowledge by the better planning and monitoring of their comprehension. This is especially evidenced in Student M's description:

> The instruction helped me to become more certain about using [Category 4] strategies; I now know they are truly useful for some questions. For example, after eliminating the incorrect options, I still went back to check the answer I chose, by understanding the vocabulary; then I would be sure I had chosen the right option. (Student M)

Discussion

The present study originated in a desire to bridge the gap in research on the role of instruction in strategies for taking tests in reading literacy. To this end, the design of this study followed the common academic practice in the field generally treating reading strategies and test-taking strategies differently. Whereas the former focuses on enhancing readers' comprehension of the text (Cohen & Upton, 2007; Erler & Finkbeiner, 2007; Rupp et al., 2006), the latter has the clear aim of empowering readers to tackle the specific item-response demands in a test to improve their test performance (Cohen, 2006; Gebril, 2018). Following this line of practice, a comparative experiment was conducted by means of involving an EG and CG. The instruments (i.e., the TOEIC reading tests, strategy questionnaires, and interviews) used in this study generated quantitative and qualitative evidence in support of the instruction in test-taking strategy. Specifically, it was found that the EG used significantly more test-taking strategies, its members significantly outperformed the CG in TOEIC tests, and they strongly approved of the feasibility of the instruction in test-taking strategy. Collectively, the findings enrich the literature in this field by suggesting the effectiveness of such instruction for improving students' reading performance and metacognitive awareness in the use of test-taking strategy. In turn, the evidence generated here, in turn, has also justified the specific goal of this study and its research design.

The results of this study correspond to those in many prior studies that document the positive relationship between strategy instruction and reading performance (Akkakoson, 2013; Karimi, 2015; Macaro & Erler, 2008; Manoli et al., 2016). All these studies confirm that strategy instruction after training in multiple strategies contributed to participants' strategic reading behaviors and performance. Moreover, the findings of this study lend further support to the argument that targeted instruction in test-taking strategy was felt feasible from the learner's perspective and significantly affected students' use of test-taking strategies. Specifically, the findings showed that EG students were better able to use the strategies pertaining to word-based/lexico-grammatical, sentence-based, and reading comprehension questions. Although no statistically significant differences were found in their use of technical strategies before and after the treatment, their qualitative accounts did verify the need to teach these strategies, given that the instructions convinced students of their usefulness. Finally, participants' positive affective endorsement recorded in the interviews raises the feasibility of instruction in test-taking strategy.

In addition to confirming the importance of teaching test-taking strategies, it is also critical to address the reasons why the four categories of test-taking strategies might be effective. First, knowledge of basic linguistic and grammatical skills is considered fundamental in accounting for

individual differences in comprehension (Grabe & Stoller, 2013). This may explain why the teaching of word-based and lexico-grammatical strategies aids students of varying vocabulary proficiency to either better (or more quickly) focus on necessary information or to opt for the most feasible answers. This is especially valid for some of the sections of TOEIC (e.g., Sentence Completion) that measure the ability to comprehend individual word or phrase meanings. The need to teach such skills is also revealed in the interview responses, where some participants reported using some of the test-taking strategies to successfully correct their first answers.

The exception in Category 1 appears only with Strategy 6 (*figuring out the target vocabulary by focusing on prefixes or suffixes*) where a slight decrease in frequency of use was reported, despite the effectiveness of this strategy in word recognition that scholars have claimed (e.g., Grabe, 2009; Macaro & Erler, 2008; Zhang et al., 2014). Causes may include students' limited knowledge of many prefixes or suffixes, because, without having learned about them, it is difficult to guess their meaning, as some interviewees reported. Nevertheless, it may not be premature to reason that the effectiveness of other test-taking strategies in the category has perhaps enabled students to tackle certain questions better, thus reducing the need to use Strategy 6 to guess the meaning of certain prefixes/suffixes.

The significant improvement found in Category 2–namely, sentence-based strategies–also testifies to its importance for enabling participants to synthesize information across a number of information sources in a sentence. Two most frequently observed strategies in this regard are Strategy 7 (*Using the understanding of the overall context to infer the option*) and Strategy 11 (*Rereading the sentences that are not clear or understandable*), since they may contribute to maintaining textual meaning at a sentence or paragraph level. The value of teaching Category 2 test-taking strategies is also shown in its helpfulness for inter-sentential linking and its building of a coherent representation of cognitive processing at sentence level (Karimi, 2015; Nikolov, 2006). However, it should be noted that the effectiveness of test-taking strategies in this category works best when complemented by those of Category 1 because the interview responses revealed time after time that participants tended to combine the strategies of these two categories to boost comprehension. This interpretation is more convincing from the reflection that linguistic knowledge acts as a prerequisite to meaning construction, so even with strategic knowledge, participants still need basic vocabulary knowledge to build sentence processing (Macaro & Erler, 2008; Shapiro, 2011).

Some possible reasons why Category 3 test-taking strategies are useful against the specific format of multiple-choice that TOEIC employs are as follows. This category involves strategies such as *locating the related text to look for clues after reading the question* (Strategy 14) and *matching the key word in the question/options to the text* (Strategy 17). When coping with multiple-choice, strategies such as these should enhance students' awareness of what critical content to pay attention to or where they may find key information (Rupp et al., 2006). That is, with a strategic outlook, participants know that they can use the questions and options to indicate which portions of the text tend to be worth reading. Indeed, as shown in the interviewees' accounts, they did take advantage of this test format when they needed strategies to get clues about the important parts of the text and ignore the remainder that was not covered by the test questions. Such strategies are important especially given the critical time constraints for standardized tests (cf. Everett & Colman, 2003), such as the TOEIC test.

It should be explained why Category 4 test-taking strategies will still be considered in future instruction, even when no statistically significant differences were found before and after the instruction. First, although the interview accounts revealed that participants' background in certain test-taking strategies before the experiment may be a major factor in the results, the importance of teaching Category 4 strategies is still evidenced in the increase in learners' confidence from using them, as the interviewees asserted. Second, learners' familiarity with some test-taking strategies should have increased the scores for them in the entry questionnaire, consequently limiting the overall improvement in the exit questionnaire. Nevertheless, a marginal significance was still detected, which should confirm that the participants indeed used Category 4 strategies more or better. Given this, it may not be unreasonable to tentatively claim the necessity and validity of teaching Category 4 test-taking strategies, not least because other groups of learners may have no similar background knowledge.

Pedagogical Implications

The findings of this study have led to some important implications for practitioners in the field. First, the learners of this study used the test-taking strategies in this study. This endorses the call for teachers to demonstrate in class how different test-taking strategies can be effectively used together to tackle difficult tasks in a test. Second, the EG employed significantly more test-taking strategies (i.e., those of Categories 1, 2, and 3) to cope with the word-based and lexico-grammatical, sentence-based, and reading comprehension tasks in the test. This shows teachers which test-taking strategies may be easier for students to use in tests. Namely, these specific strategies may be prioritized for students who are first introduced to them because they should serve as effective pedagogical starters. Additionally, the study findings reveal the importance of students taking advantage of the formats used in a test, such as multiple-choice items, thus highlighting the significance of familiarizing test takers with their use of test-taking strategies and the formats used in the tests that they will take. Finally, this study also implies that practitioners should also build up students' confidence in the usefulness of the strategies taught to them, a pedagogical implication reflected in the participants' collective feedback regarding the Category 4 test-taking strategies in this study.

Limitations and Suggestions for Future Studies

The current research has presented a successful case with evidence encouraging the teaching of test-taking strategies, but there are the limitations that await contributions from future studies.

First, the actual strategy use by the CG was not observed. They may have used some, but without such specific coaching as this study tested, they might have used fewer. Information on this point should let researchers compare students' differences in the use of test-taking strategy with or without the treatment.

Second, this study relied much on the EG's account of its test-taking strategy use before and after the experiment. However, it did not examine participants' real-time feedback on the test-taking strategies they used in taking the exam. Future research might consider including this way of illuminating these strategies.

Third, as noted above, EG students reported not using the particular strategy of analyzing the prefixes and suffixes of words. Although some possible reasons are addressed in the Discussion section, the actual causes of such avoidance behavior require further investigation.

Moreover, only half of the EG participants (i.e., 36 out of the 68 students) provided test-taking strategy information in interviews. Such accounts may still be unrepresentative of the group as a whole, and future research might elicit accounts of their experience from more participants.

Furthermore, the current study focused only on the possible effect of the specific test-taking strategies adopted from Lee (2018) on the test takers' performance. However, such a design omitted other important variables that could have affected participants' receptivity to the strategies taught, such as using their personal reading strategies for inferring, understanding details, etc. Considering these strategies for this kind of treatment is important, because "[they] do not exist in isolation but are involved in various combinations in reading any particular text" (Harding, Alderson, & Brunfaut, 2015, p. 322), including reading for tests. Following this line of discussion, a more meaningful experimental treatment would be first to diagnose students' test-taking strategies and then to tailor precise treatment for them. For designing in general, the researcher, following Alderson (2005), submits that the more focused the diagnosis, the more effective the custom-made test-taking strategy, and the more precise the evaluation of the pedagogical effectiveness of the instruction in test-taking strategy.

Finally, as acknowledged in the methods section, the study was conducted on the researcher's own students, which unavoidably causes some ethical concerns that could have affected the results. To avoid this, future researchers may consider recruiting voluntary participants from outside their own classes in order to more objectively investigate students' perceptions of the effects of the test-taking strategy.

Conclusions

Almost all research on instruction contexts has focused on general reading strategies. Given the dearth of research on instruction in test-taking strategy, this study used a researcher-manipulated experimental evaluation to assess the instructional effect of test-taking strategy treatment on Taiwanese undergraduates. The findings of this study enabled the present researcher to conclude that, unlike traditional English reading classes where teaching is mostly restricted to linguistic knowledge of vocabulary or grammar, classes which include instruction in test-taking strategy can empower students to use their current knowledge to its fullest extent and thus achieve the best possible scores in reading comprehension. Since instruction in test-taking strategy is also favorably viewed by students, future EFL/ESL reading instructional programs may boldly consider its inclusion for student readers even before more evidence is sought for a wider learner population.

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Appendix A

Test-taking Strategy Questionnaire

Instruction: This 5-point Likert-scale survey contains 24 items. Please assign to each item a number between one and five. The smaller the number you assign to an item, the less frequently you use that particular item. In contrast, the larger the number you assign to an item, the more frequently you use that particular item.

Test-taking Strategy Questionnaire

Strategies	**Frequency**				
I. Word-based/lexico-grammatical strategies					
1. Using the understanding of vocabulary to select the correct answer.	1	2	3	4	5
2. Considering the word form by knowledge of the English grammatical rules.	1	2	3	4	5
3. Considering the word tense/voice by knowledge of the English grammatical rules	1	2	3	4	5
4. Considering the fixed expressions or idioms of English.	1	2	3	4	5
5. Considering the verb tense by focusing on time phrases.	1	2	3	4	5
6. Figuring out the target vocabulary by focusing on its prefixes or suffixes.	1	2	3	4	5
II. Sentence-based strategies					
7. Using the understanding of the overall context to infer an option.	1	2	3	4	5
8. Taking advantage of semantic clues.	1	2	3	4	5
9. Paraphrasing or translating sentences to enhance understanding.	1	2	3	4	5
10. Jumping immediately to the part which contained the missing word and focusing on neighboring parts.	1	2	3	4	5
11. Rereading the sentences that are not clear or understandable.	1	2	3	4	5
III. Reading comprehension strategies.					
12. Reading all the questions first as a mental note before going on to the passage.	1	2	3	4	5
13. Skimming the passage quickly to note the chief points before reading the questions.	1	2	3	4	5
14. Reading the question before looking for clues in the related text.	1	2	3	4	5
15. Rereading a portion of the passage carefully if it seems to contain a possible answer.	1	2	3	4	5
16. Extracting the key sentences that convey the main information.	1	2	3	4	5
17. Matching the key word in the question/options to the text.	1	2	3	4	5
18. Focusing on titles, names, numbers, quotations or examples.	1	2	3	4	5
19. Identifying the relationship between the passages.	1	2	3	4	5
IV. Technical approaches.					
20. Using the process of elimination to approach an answer.	1	2	3	4	5
21. When struggling with answer options, focusing on the parts which may contain potential answers.	1	2	3	4	5
22. Skipping the questions that are perceived to be difficult and time-consuming.	1	2	3	4	5
23. Using background knowledge in educated guesses.	1	2	3	4	5
24. Calculating the remaining time in order to adjust the reading speed.	1	2	3	4	5

Appendix B

Interview Guide

Note. Presented in this appendix are some notes that I as the researcher created to ensure that the interviews went effectively with every student taking part.

#1. Prepare students for the interview by again explaining its purpose to them. Remember also to assure them that their responses, regardless of positivity or negativity, will have no impact on their subject scores or relationship with me.

#2. Remind students of the need for the interviews to be recorded for analysis.

#3. Tell students not to be distracted by or worried about my note-taking during the interview. Explain to them that the notes taken are simply for me to ask follow-up questions or ask for clarification.

#4. Ask the seven main open-ended questions created (see Appendix C). Cross out a question after it has been asked.

#5. After a question has been asked, wait patiently for students to respond. Allow them several seconds or even a minute to recall the experience. (If they pause for too long, ask them if they'd like me to repeat myself or rephrase the question.)

#6. Don't interrupt when a student is responding. Allow them to finish their responses first. Meanwhile, take notes of anything in the statement, information, or description that needs further explanation or clarification; ask follow-up questions then.

#7. Ask students to give specific examples of the strategies they described in their responses.

#8. Ask follow-up questions to let students explain their responses further, such as "could you say something more about that?" "what do you mean by that? or "could you demonstrate how you did that?"

#9. Ask follow-up questions when a student's response is ambiguous.

Appendix C

Interview Questions

1. Describe your general experience of taking the instruction in test-taking strategies this semester.
2. How would you evaluate the pedagogical effects of the instruction in test-taking strategies?
3. Recall your experience of using any specific test-taking strategies when performing a TOEIC test in the experiment.
4. Describe your perspectives on or perceptions of the test-taking strategies that you have learned with me this semester.
5. Are there any differences between your use of test-taking strategies before and after the treatment? If yes, please elaborate.
6. Have you encountered any difficulties in using the test-taking strategies taught in the class? If yes, please elaborate.
7. Would you consider taking part in similar instruction in future? Why or why not?

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