

# The Evaluation of Computer Assisted Prewriting for Young EFL Writers

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**Abstract:** *This study aimed to determine the effect of instruction in computer assisted prewriting strategies on the early L2 literacy of elementary-school EFL students. This study adopted a quasi-experiment design involving two English reading ability tests, and one English writing test. Two intact classes of 56 elementary-school students participated in the study. The results showed that the computer assisted prewriting group significantly outperformed the traditional paper-and-pencil-based group in reading ability, writing quality, and writing quantity. The obtained results could be useful when developing an effective writing instruction model for beginning elementary-school EFL writers with the support of computer assisted prewriting strategies.*

**Keywords:** early L2 literacy, computer assisted prewriting, second language writing.

## 1. Introduction

The writing ability is important for the instruction of second-language (L2) learners, since it is not only a vital skill for academic or occupational success but also acts as an effective tool to raise the awareness that L2 learners have of knowledge gaps (Warschauer, 2010). Educators of English as a foreign language (EFL) have recently given more attention to literacy development, recognizing that students need to be able to read and write effectively if they are going to be successful in English language classrooms (Urzua, 1987).

Numerous studies have proposed prewriting strategies as one of the most effective ways to help beginning EFL writers to start their writing tasks (Brodney, Revves, & Kazelskis, 1999). However, most of these studies have involved older learners, such as junior-high-school students (Lin, Strickland, Ray, & Denner, 2004), senior-high-school students (Chiou,

2008), or college students and adults (Zaid, 2011). Moreover, the few studies that involved elementary-school EFL classrooms only considered instruction in a single prewriting strategy, such as concept mapping (Lin, 2010b), without taking into account other possibly effective prewriting strategies. Furthermore, mind mapping, brainstorming, and drawing tools are often adopted in real-life classrooms as prewriting strategies. No studies in Taiwan have focused on investigating the effect of prewriting strategies such as brainstorming and drawing tools on beginning EFL writing instruction, nor have they examined which prewriting strategy would be the most beneficial to beginning elementary-school EFL writers.

The advantages of computer assisted writing have been confirmed previously. This approach can effectively support authentic learning and process-based writing activities (Johnson & Johnson, 2004) and enhance the L2 literacy of learners (Wepner & Ray, 2000) and improve writing quantity, quality, and revision efforts (Goldberg, Russell, & Cook, 2003). Technology allows learners to visualize their thinking processes and teachers to better understand their students' learning, and thus allow teachers to determine how to improve their writing instruction. In spite of these advantages, no previous studies in Taiwan have attempted to incorporate computer assisted writing and different prewriting strategies in elementary-school settings.

While considering the lack of research on the effects of computer assisted prewriting strategies on elementary L2 learners' writing performance, the aim of this study was to compare the efficacy of computer-supported and paper-and-pencil-based prewriting-strategy instruction methods in an investigation of the preferences of elementary-school EFL students in prewriting strategies as well as the effects of prewriting strategies on the writing performances and early literacy of students. Two questions were posed to address this: does computer assisted prewriting strategy benefit the (1) writing performances and (2) early literacy of young English as a foreign language (EFL) writers? A quasi-experiment design involving two English reading ability tests, and one English writing test was adopted. Two intact classes of 56 elementary-school students participated in the study.

The following sections provide a briefly description of study method. The results of the data analysis are then presented and discussed, and conclusions drawn.

## **2. Method**

### ***2.1. Participants***

This study recruited 2 intact classes of fifth-grade students (56 students, each class comprising 28 students) from an elementary school in Taipei City by convenience sampling. Each class was randomly assigned to the experimental or control group. The control group

received instruction in traditional paper-and-pencil-based prewriting strategies, while the experimental group received instruction in computer assisted prewriting strategies (CAPSs). Both groups were allowed to freely choose among the three proposed prewriting strategies (mind mapping, drawing, and text chatting) while they were performing cooperative writing activities. Additionally, the participants in each class were further divided into heterogeneous writing groups of four students with different EFL ability.

## **2.2. Instruments**

**2.2.1. Early English reading ability tests.** Two tests were used to assess the early English reading abilities of the participants. The first was the DIBELS™ Nonsense Word Fluency (NWF) test. It is one of the subassessments of the Dynamic Indicators of Basic Early Literacy Skills™ 6<sup>th</sup> Edition (DIBELS™) (Good & Kaminski, 2002). The second one was a reading comprehension test (RCT) designed by the authors, reviewed by 3 experts in the field, and administered to 165 fifth graders at the same school in a pilot study.

**2.2.2. English writing test.** The writing performance of the participants was assessed using one test designed by the authors: the English Composition Test (ECT). The test was reviewed by 3 experts in this field and administered to 165 fifth graders at the same school in a pilot study. The ECT was administered to all of the participants before and after the treatment as pre- and posttests.

**2.2.3. Writing rubrics.** This study adopted the detailed scoring guidelines of Jacob et al. (1981) to assess the qualities of the learners' writing compositions. The writing rubrics consisted of content, organization, vocabulary, language use, and mechanics.

## **2.3. CAPSs tools**

This study was implemented by offering the experimental group three CAPSs tools from the Brain Sparkling Module of the writing platform (as shown in Figure 1) developed by Lan et al. (2008) while they were performing group writing tasks. Three CAPSs were provided: text chatting, mind mapping, and drawing. In addition, the members of the control group were offered the same three paper-based prewriting tools to help them collect and discuss ideas for their individual or group writing tasks.



Figure 1. Three cooperative prewriting tools in the writing platform.

## 2.4. Design

This study investigated the effect of the CAPSs instruction on the L2 literacy and writing performance of elementary-school students using a pretest–posttest, quasi-experiment design. Both L2 learners' reading and writing scores were collected and analyzed.

## 2.5. Procedure

The treatment lasted for 6 weeks, and each class period lasted 40 minutes, twice weekly. Before the treatment, the participants took both the English writing and reading (NWF and RCT) tests to determine their L2 literacy. They were also taught the three prewriting strategies: text chatting, drawing, and mind mapping. The experimental group also received additional training on using the writing platform and online prewriting tools.

During the two meetings each week the participants first received instruction on how to write a riddle or story. They then worked on their own, practicing writing their own individual written work, and submitted their work. After that they started their cooperative writing tasks, and they had to submit their group creation and conduct peer assessment. Each group presented and shared their riddles or stories with the whole class at the last meeting. After the last instruction session, the participants had to take the English reading and writing tests again.

The teaching activities were the same in the control group, except that all of the teaching materials were paper-based. The other procedures, time limits, and the content of the English tests were the same as for the experimental group.

## 3. Results

### 3.1. Preferences of students for prewriting strategies

Soon after students finished their first writing task, the prewriting strategies they had chosen were checked, and the frequencies of the chosen strategies were computed. Table 1 lists the results for the preferred prewriting strategies. Chi-square analysis indicated that the prewriting strategies did not differ significantly between the experimental and control groups ( $\chi^2_{(2,1)} = 4.43, p > .05$ ). Additionally, the first consideration in both groups when choosing a prewriting strategy was its ease of use.

Table 1. *Results of prewriting strategy survey*

| Group        | Mind mapping |         | Drawing |         | Brainstorming |         |
|--------------|--------------|---------|---------|---------|---------------|---------|
|              | N            | (%)     | N       | (%)     | N             | (%)     |
| Experimental | 8            | (28.6%) | 8       | (28.6%) | 12            | (42.8%) |
| Control      | 11           | (39.3%) | 9       | (32.1%) | 8             | (28.6%) |

### 3.2. English ability tests (reading and writing)

The English abilities of all students were determined before and after the treatment by administering individual tests: NWF, RCT, and ECT. A two-way ANCOVA was conducted to determine how various dependent variables differed between students in the experimental and control groups. The independent variables were the group (experimental and control) and test (pre- and posttests), while the dependent variables were the scores for English skills (Oral Reading Fluency and Retell Fluency). The covariate was student EFL scores from the previous semester. Results were considered to be statistically significant when  $\alpha < .05$ .

The pre- and posttest scores (mean and standard deviation values) of the three tests are presented in Table 2. The homogeneity tests of regression coefficients for the four tests were all insignificant: NWF,  $F(53,1) = 1.15, p > .05$ ; RCT,  $F(53,1) = 1.31, p > .05$ ; and ECT,  $F(53,1) = .00, p > .05$ .

Table 2. *Descriptive Statistics of English ability tests*

| Test     | Group               | NWF   |       | RCT   |       | ECT   |      |
|----------|---------------------|-------|-------|-------|-------|-------|------|
|          |                     | M     | SD    | M     | SD    | M     | SD   |
| Pretest  | Experimental (N=28) | 28.29 | 16.83 | 37.86 | 18.73 | 9.31  | 8.16 |
|          | Control (N=28)      | 26.29 | 16.62 | 34.29 | 17.94 | 10.33 | 7.46 |
| Posttest | Experimental (N=28) | 32.93 | 19.17 | 44.29 | 22.68 | 15.28 | 6.12 |

**3.2.1. Comparison of NWF scores.** Two-way ANCOVA revealed a significant interaction between group and test NWF scores ( $F(1, 54) = 14.02, p < .05$ ), with the magnitude of the difference varying according to level. A simple main-effect analysis demonstrated no statistically significant difference between the two groups in the NWF pretest scores ( $F(1, 53) = .02, p > .05$ ). However, the two groups performed significantly differently in the NWF posttest ( $F(1, 53) = 4.82, p < .05$ ), meaning that the knowledge of the alphabetic principle was the same in both groups before the study, but after the intervention the alphabetic spelling ability was significantly better in the experimental group.

There was a significant test effect on the performances of both groups in NWF tests. The experimental group performed significantly better in the NWF posttest than in the pretest ( $F(1, 54) = 5.96, p < .05$ ), whereas the control group performed significantly worse in the posttest than in the pretest ( $F(1, 53) = 8.14, p < .05$ ). These results indicate that the treatment resulted in significant progress in the experimental group.

**3.2.2. Comparison of RCT scores.** There were no significant test-by-group ( $F(1, 54) = 2.61, p > .05$ ), group ( $F(1, 52) = .20, p > .05$ ), or test ( $F(1, 54) = 1.33, p > .05$ ) effects in the RCT scores, meaning that the reading comprehension ability did not differ significantly between the experimental and control groups. Although the experimental group made progress in reading comprehension after the treatment, it was still only marginally better than that in the control group ( $F(1, 54) = 3.83, p = .055 > .05$ ).

**3.2.3. Comparison of ECT scores.** There were significant test-by-group effects in the ECT scores ( $F(1, 54) = 15.66, p < .05$ ), with the magnitude of the difference varying according to level. A simple main-effect analysis demonstrated no statistically significant difference between the two groups in the ECT pretest scores ( $F(1, 53) = 3.38, p > .05$ ) but a significant difference at the posttest ( $F(1, 53) = 5.23, p < .05$ ), meaning that the experimental group outperformed the control group after the treatment. The test of the main effect of the ECT revealed that the experimental group made significant progress in the posttest ( $F(1, 54) = 36.58, p < .05$ ) whereas the control group did not ( $F(1, 53) = .20, p > .05$ ).

#### 4. Discussion and conclusion

This study investigated the effects of instruction in CAPSs on the L2 literacy in elementary-school EFL students. The scores in the NWF test were higher in the experimental group than in the control group, and they improved significantly after the treatment. The RCT scores indicated that the experimental group outdid the control group, and also made almost

significant progress. Such results indicated that the proposed CSCPWSs are beneficial to the reading ability of EFL pupils.

In contrast, the control group showed mixed results in the tests. For example, NWF scores dropped significantly after the treatment in the control group. This was found to be due to low-ability students in the control group giving up answering test items in the posttests. In contrast, this phenomenon was rarely seen among the low-ability students in the experimental group, even though they often did not progress markedly after the treatment. This indicates that CAPSs were effective at preventing them from giving up when encountering difficulties in their learning.

With regard to the overall writing performance, the results showed that CAPSs can facilitate the writing ability of students, as demonstrated by the posttest scores in the experimental and control groups. Those in the experimental group significantly outperformed those in the control group in the writing test, and also significantly improved their writing abilities.

The finding that the writing quality and quantity was significantly better in the experimental group than in the control group confirms with the results of previous studies (Bangert-Drown, 1993; Goldberg, Russell, & Cook, 2003). It seemed that early writing instruction involving prewriting strategies can help beginning EFL learners to write compositions of better quality and a higher accuracy of form. Moreover, those in the experimental group wrote significantly longer passages than those in the control group after the treatment, and significant progress also appeared after the treatment. This further supports the efficacy of such early writing instruction involving technology and prewriting strategies.

The writing instruction proposed in the current study also solved the problems found in previous EFL writing research conducted at Taiwanese elementary schools. For example, Wang (2005) found that hand-drawn mind mapping only improved the writing structural organization of the students, and not their overall writing quality. Lin (2010b) included a cooperative learning element in hand-drawn mind-mapping experiments, but positive gains were found only in the writing quality, organization, and spelling of the students, and not in their writing motivation. Lin (2010a) used picture prompts to promote writing ability, but found that this had no significant effect on the writing proficiency and attitude. The CSCPWSs used in the current study avoided these drawbacks of paper-and-pencil-based writing in the previous studies due to the incorporation of prewriting strategies, computer technology, and cooperative learning into early EFL writing instruction.

Lastly, the three prewriting strategies proposed in this study have different properties: (1)

mind mapping is a graphic organizer for visualizing ideas via the use of words, images, and symbols; (2) drawing is image-based and involves visualizations; and (3) text chatting is a text-based group exercise for enhancing collective knowledge. The experiments have shown that CAPSs instruction is more effective and feasible than traditional paper-and-pencil-based instruction in enhancing the L2 literacy of beginning EFL students.

This study also preliminarily investigated the preferences of students for these three prewriting strategies and the reasons for choosing them. However, the number of students choosing each strategy was small, and their first consideration for choosing a strategy was its usability. Therefore, this study only represents an exciting first step, with further research obviously being required. It would be beneficial for future studies to involve larger populations and investigate the effects of these three CAPSs on students with different English ability levels.

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