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# Teaching ESL Beginners Metacognitive Writing Strategies Through Multimedia Software

**This case study explores how strategy-based instruction (SBI), assisted by multimedia software, can be incorporated to teach beginning-level ESL learners metacognitive writing strategies. Two beginning-level adult learners participated in a 10-session SBI on planning and organizing strategies. The Cognitive Academic Language Learning Approach (CALLA) was implemented with the aid of graphic organizer software. Our findings show that technology-supported SBI has brought multiple benefits for the learners. Comparisons of writings before and after SBI indicate that there is noticeable improvement in learners' ability to generate ideas and in logical organization of their essays. Researchers' observation notes and learners' reflections suggest that learners' engagement and motivation are boosted during their prewriting activities using the graphic organizer software. A close examination of the semantic maps generated from the writing software also reveals how learners practice metacognitive planning and organizing strategies for their writing. Finally, recommendations are made for future instructors and researchers investigating this topic.**

## Introduction

We, as English language teachers, have witnessed that our L2 learners, especially low-proficient ones, are struggling with the seemingly formidable task of academic writing and with the use of metacognitive writing strategies to tackle the demands of writing tasks. Researchers in the field of language-learning strategies (LLS) have increasingly zeroed in on how strategy-based instruction (SBI) can better enhance L2 learners' language development and make learning more enjoyable, effective, and efficient (Oxford, 1990). Empirical studies on LLS have shown that SBI can facilitate ESL

students' language learning, improve learning motivation, and reduce learning anxiety (Oxford, Lavine, Felkins, Hollaway, & Saleh, 1996).

By the same LLS token, metacognitive strategies (e.g., planning and organizing) have been proven to be beneficial in learning unfamiliar content by low-proficient learners (Ching, 2002). In our teaching context, two adult ESL beginners who were receiving remedial instruction on academic writing also epitomize this phenomenon. That is, low-achieving ESL beginners are usually constrained not only by the language barrier, but also by the unfamiliarity with appropriate LLS to help them cope with the demands of academic writing.

To better align instruction with language learners' digital learning styles, Oxford (2008) has called for integrating digital technology into language instruction. Nevertheless, implementing digital technology to enhance ESL beginners' use of metacognitive strategies in writing is still an area that deserves more research attention in order to provide theoretical and pedagogical implications.

The aforementioned concerns have motivated us to investigate how L2 beginners tap into metacognitive planning and organizing strategies during the prewriting stage and whether explicit SBI supported by multimedia technology can enhance their strategy use, which also leads to their writing development. The following literature review will provide further explanations about why it is crucial to conduct LLS research on this domain.

## Background

### *The Composing Processes of L1 and L2 Writers*

The composing processes of L1 and L2 writers have been of primary interest to L1 and L2 writing researchers for the past several decades. Studies on L1 and L2 writers' composing processes suggested that planning and organizing are critical skills for proficient writers (De La Paz & Graham, 2002; Sasaki, 2000). These studies revealed that

1. Skilled L2 writers plan more and structure their ideas better than less skilled writers;
2. Planning before writing (i.e., advanced planning) helps in reducing the cognitive load of short-term memory;
3. The strategies of planning and organizing are teachable skills.

In light of those findings, we decided to focus on planning and organizing strategies in our study because we hypothesized that instruction in these strategies could facilitate our students' academic writing development.

### *Metacognitive Strategies*

Flavell (1979) defined metacognition as "knowledge and cognition about cognitive phenomena" (p. 906). Metacognitive strategies include such "actions" as planning, organizing, monitoring, and evaluating. The use of metacognitive strategies requires both *metacognitive regulation* and *metacognitive knowledge* (i.e., knowledge about self, tasks, and strategies). In the context of writing, instruction of planning and organizing strategies is shown to become more effective by integrating self-regulation (i.e., student self-monitoring) as part of strategy instruction, because self-regulation helps students develop awareness of their writing process and make more informed choices about strategy use (Ching, 2002).

### *Influence of SBI on Strategy Use and Writing Proficiency*

The overarching purpose of SBI is to help students become "self-directed, autonomous and effective learners through the improved use of language learning strategies" (Oxford & Leaver, 1996, p. 227). Studies investigating the influence of writing-strategy instruction have been both descriptive and interventionist in nature. The focus of the descriptive studies has been on reporting the association between strategy use and ESL students' writing proficiency (e.g., Kobayashi & Rinnert, 2001). The interventionist studies have experimentally measured the effects of strategy training on strategy use (e.g., Sasaki, 2000). Findings from those studies suggested that explicit SBI can make a difference in language learners' strategy use as well as writing proficiency.[1]

### *Models of Strategy Instruction*

Some commonly implemented metacognitive instruction models include but are not limited to "the self-regulated strategy development model" (De La Paz & Graham, 2002) and "the Cognitive Academic Language Learning Approach" (CALLA) (Chamot & O'Malley, 1996). These models include components of instructor modeling, scaffolding, and student self-evaluation. In our study, we incorporated CALLA into our SBI because it can be adopted in different contexts, such as beginning-level, bilingual classrooms or pull-out ESL programs as illustrated in the *CALLA Handbook* (Chamot & O'Malley, 1993).

### *Technology-Supported SBI for Writing*

Given the fact that the 21st century is a digital era, most of our L2 learners are digital natives who use a wide range of technologies daily (Prensky, 2001). In that digital sense, using multimedia technology to support language instruction can better align with their digital

learning styles and interests (Oxford, 2008). Research on integrating technology into strategy instruction across language skills provides pedagogical implications for researchers and teachers to better understand how technology-supported SBI can optimize learners' language development, such as L2 learners' development of reading comprehension and strategies (Dreyer & Nel, 2003), or their improvement in listening comprehension (Vandergrift, 2004).

If we zoom our LLS lens in on the effects of technology-supported SBI on beginners' writing development, we see in Lorenz, Green, and Brown's study (2009) that integrating graphic organizer software into the prewriting process results in improvement in primary school children's writing of personal narratives in L1, specifically in logical organization. Students in their study have also demonstrated more engagement and motivation using graphic organizer software to help them generate and organize ideas during the prewriting process than they have in the traditional prewriting approach using paper and pencil only.

Despite the fact that previous studies have shown the beneficial effects in language gains to which technology-supported SBI can lead (e.g., L2 learners' receptive skills in reading and listening, L1 children's writing development), whether or not similar positive results could carry over to L2 adult learners at lower proficiency levels and to L2 writing still deserves more research attention (e.g., L2 adult beginners' writing development). As such, our study aimed to provide both research and practical implications on L2 adult beginners' strategy use and writing performance to further dialogues on technology-supported SBI. Specifically, our research purpose was to explore *how explicit SBI on metacognitive planning and organizing strategies through the use of graphic organizer writing software is related to changes in ESL beginners' strategy use and writing development.*

## The Study

To investigate this issue, our study employed a mixed-method design that involved both quantitative analyses of writing scores and qualitative analyses of strategy use and learning process. Writing software embedded in SBI was implemented throughout 10 sessions in five weeks. Researcher observations were also made throughout the duration of SBI to document moment-to-moment changes in student writing and strategy use.

### *Participants*

Two adult ESL beginners—Bao (Vietnamese) and Kim (Korean)—participated in this study.[2] Because their English proficiency did

not meet the English requirements for regular academic studies in US colleges, they were both enrolled in an intensive reading and writing class at an English Language Institute of a Northeastern US university. Both of them reported that they had received English instruction before they came to the US. However, their English proficiency, based on their instructor's assessment, was much lower than that of the other students enrolled in the same class. They could neither understand the instruction given by their English instructor nor communicate their thoughts in English. Therefore, they were "pulled out" of their regular class to receive additional writing assistance from us.

***Data Collection Procedure***

**Strategy-Based Instruction (SBI).** We implemented a 10-session SBI following the CALLA model (Chamot & O'Malley, 1996). We met the students twice a week, 90 minutes per session, over five weeks. Since the metacognitive writing strategies that we targeted were planning and organizing strategies, graphic organizer writing software was used to facilitate and scaffold the strategy learning.[3] With the software, students could use its embedded graphic organizers (e.g., concept maps and brainstorming webs) to express their ideas freely via the mapping feature (*planning*), as well as categorize their thoughts by grouping related information together (*organizing*).

Following the five-step principles in the CALLA model (prepare, present, practice, evaluate, and extend), our SBI started with *preparation,* during which we introduced the concepts of planning and organizing strategies. Next, we *modeled* how to use the strategies by generating a concept map for a writing prompt via the writing software. Then, we provided students with the opportunity to *practice* creating their own concept maps. We also provided scaffolding whenever there was such a need. Finally, we asked students to *self-evaluate* their learning process and tried out the strategies on a new writing task (i.e., *extend*).

**Pre- and Posttests.** We conducted a pre- and posttest design to examine the effects of strategy instruction on students' writing performance. The pretest was used to establish the baseline for students' writing performance. It also helped researchers/instructors understand the weaknesses in students' writing so that we could target our strategy instruction to those weaknesses. Both the pre- and posttests were a 30-minute timed writing task using a prompt that was originally selected by the students' regular course instructor (i.e., not the researchers), with the understanding that their regular instructor would have most knowledge about what prompt best suited her students' level of writing proficiency. However, in the pretest, both stu-

dents found the original prompt assigned by their regular instructor too difficult. Therefore, the researchers had to change the prompt to a speaking-to-write task in which the students first interviewed one of the researchers and then wrote a descriptive essay based on the content of the interview.

For the posttest, the students were asked to describe a recent trip they had made. The prompt for the posttest was much more challenging than that for the pretest in the sense that students had to brainstorm ideas themselves rather than reorganizing the interviewee's responses. If students were able to perform better on this more demanding prompt in the posttest, we could infer that their writing ability progressed even further than in the case when the same prompt was used in both pre- and posttests.

A holistic rubric designed for scoring Test of English as a Foreign Language (TOEFL) writing (Weigle, 2002, p. 113) was used to evaluate students' writing in both pre- and posttests. The rubric assesses writing on a scale from 0 to 6 based on the criteria of relevance to the task, organization, development of ideas, and language use.

**Student Reflection and Teacher Observation.** In addition to pre- and posttests, we collected student reflections and teacher observation notes in order to document students' progress in strategy use. For each in-class writing assignment, we kept an on-site record of students' moment-to-moment employment of metacognitive strategies, especially when we observed that students experienced difficulty in applying the strategies. Furthermore, we recorded the amount of time that students actually spent planning and organizing their essays. At the end of each session, we also prompted our students to write reflection notes (or drawing pictures when they did not know how to write) on what they had learned on that day.

### *Data Analysis*

We analyzed our data by comparing the quality of students' writing on pre- and postinstruction writing tasks. We used the scoring rubric developed for TOEFL writing assessment (Weigle, 2002) to rate student writing samples. To reduce individual rater bias, we first participated in a training session in which the researchers and the students' regular instructor discussed the rubric, compared scores, and resolved discrepancies in scores. After a satisfactory inter-rater reliability was achieved (i.e., complete agreement), each writing sample was double scored by the first two researchers independently. Any writing sample with a discrepancy score of more than one was subject to a cross-check by the third researcher.

With regard to strategy use, we compared our notes throughout the 10 sessions on the amount of time that each student spent on prewriting activities and on how students applied the planning and organizing strategies.

## Results and Discussion

Analyses of data suggested that students have benefited from technology-enhanced SBI in the following aspects: First, their writing performance has improved from the pretest to the posttest, particularly in their ability to generate ideas and organize essays (see the Appendix). Second, their abilities to brainstorm and generate concept maps with the writing software have also improved through time (see Figure 1). Finally, they have become more engaged in using planning and organizing strategies, and they have progressed from local planning to global planning (see discussion in "Strategy Use" below). Below are in-depth discussions on the changes of their strategy use and writing performance, evidenced by relevant findings drawn from student writing samples, researcher observations, and reflection notes.

### *Writing Performance*

By comparing students' pre- and postinstruction writing, we noticed that students' writing quality had improved in every aspect of the assessment criteria and both students showed progress in their ability to generate ideas for the assigned writing prompt. Their scores increased from 2 out of 6 (Bao) and 3 out of 6 (Kim) on the pretest to 4 out of 6 for both students on the posttest. For example, in the pretest, Kim had initial difficulty coming up with appropriate interview questions. He was able to generate only a few basic questions (i.e., age, nationality, hobbies) with the assistance of the researchers. In terms of his writing, the content consisted only of a rearrangement of the interviewee's responses, and there was very little development of ideas. He also showed difficulty in spelling (e.g., "jung food," "Chiness") and applying basic grammatical rules, such as subject-verb agreement (e.g., "she like," "she dislike").

In contrast, on the second writing task after SBI, he could compose a paragraph of 12 sentences for a much more difficult prompt in the same amount of time. He was able to use the past tense (e.g., "went to Canada") in some instances and the development of ideas was also much more extensive (e.g., differences between the US and Korea). To illustrate, the Appendix shows both Kim's pre- and postwriting samples.

Similar improvement occurred with the other participant—Bao. Based on our observation notes, Bao had a hard time composing five

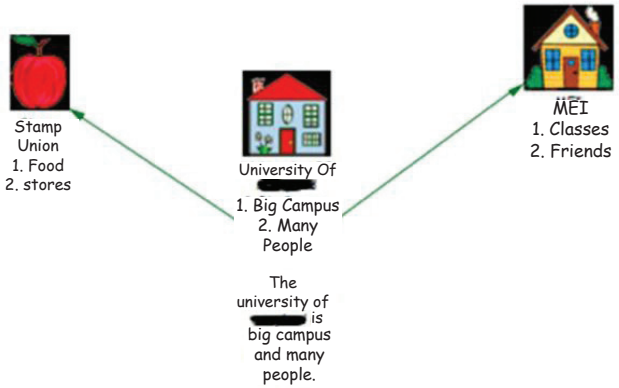
sentences in 30 minutes (pretest). However, he could come up with a paragraph of eight sentences in 45 minutes (posttest). Although Kim and Bao still exhibited limited facilities with grammar, vocabulary, and spelling in the posttest, they were able to address the prompt with some elaborations, and the overall quality and quantity of their writing were much improved if compared with those in the pretest writing task.

***The Role of Writing Software***

During the first session in which we introduced the writing-software program and demonstrated how to use it to do pretask planning, we witnessed its effects on beginners' writing process through imposing a phase of graphic organizing and semantic mapping before the actual writing process. Since the program is a visual-organizing tool that walks learners through a writing cycle of brainstorming, outlining, and elaborating, repeated practice with the software helps learners habitualize the use of planning and organizing strategies in their prewriting process. For example, Kim and Bao were prompted to write an essay assignment on "My Campus" and told to brainstorm their main ideas by creating a concept map using the graphic organizer software before starting to write the essay. Capitalizing on the graphic organizer feature embedded in the software, they were encouraged to visually represent the organization of the essay by mapping out their main ideas with relevant pictures and to generate supporting ideas under each created picture (see Bao's concept map in Figure 1). By engaging in the prewriting activity of building a concept map, they were able to practice the planning and organizing strategies during the prewriting process.

When reflecting on their experience with the graphic organizer software, students said that the graphic feature in the program created more fun in planning and organizing their ideas. The use of semantic mapping also helped them break down the major ideas into subthemes. When the students visualized these ideas in the form of a hierarchical map, they could proceed from one idea to another in a much more logical and efficient manner than they would otherwise. This finding also coincides with the positive effects of using graphic organizer software for prewriting activity that further reinforces beginner writers' on-task motivation and engagement and improves logical organization, as evidenced in Lorenz et al.'s (2009) study.

Judging by the types of improvement that were observed from student writing and the nature of the writing software, we argue that the changes in student writing performance were primarily attributed to our SBI supported by the graphic organizer writing software. Ac-




The university is big campus and many people.

Stamp Union

1. Food

2. stores

I felt that the stamp union is big too. The first two weeks was not bad. But after that I hate stamp food. Because there is only fastfood, jungfood. Also price is expensive. I think stamp union of good point is so many rest area. And bank, post office, store from one place so convenient.

*Figure 1.* Sample of Bao's conceptual map exported from the Kidspiration software.

cording to Lorenz et al. (2009), the benefits of using graphic organizer software include helping learners maintain topic relevance, improve rhetorical organization of the essay, and increase the quantity of writing. Analyses of student writing in the pre- and posttests indicated that students made most progress in their ability to generate ideas (and hence longer essays) and in the structural organization of their essays. Given the fact that the students were pulled out of their regular class to receive SBI from us and that they rarely wrote in English outside class, we could rule out the possibility that such changes in their writing were due to factors other than our technology-enhanced SBI.

***Strategy Use***

Our in-class observation notes and students' reflection notes also revealed that students had changed their strategy use in two ways. First, students allocated more time to prewriting activities, such as brainstorming and organizing ideas. One of the students, Kim, spent nearly half of the time on planning and brainstorming ideas when he was taking the posttest. However, he was not engaged in any prewriting activity on his pretest. Second, we saw a shift from *local planning*

(planning at the lexical level) to *global planning* (planning at the discourse level) as our SBI proceeded (Sasaki, 2000). That is, during the first few SBI sessions, we often observed that students started to write a few words or sentences, paused, crossed out what they wrote, and started again. As SBI went along, we noticed that students became much more accustomed to drawing an outline before they started to write, and they paused very little in the process of writing.

Similar to the argument we made for writing performance, we would also infer that differences in students' strategy use were related to our use of the software in SBI. Our findings about the students' increased involvement with prewriting planning and improved writing fluency were consistent with the benefits that were claimed about the writing software by previous researchers (e.g., Roberts, 2002).

### *Individual Differences*

Apart from Kim's shift in the use of planning strategy from pre- to posttests, there was also a noticeable difference between the way in which the two participants, Kim and Bao, employed the planning and organizing strategies. Bao allocated more time to the actual composing process, while Kim spent a lot of time on his pretask planning. A second difference was that Bao completed the entire process of brainstorming and writing through the medium of computer, whereas Kim had to fall back on paper and pencil to sketch a draft before word-processing what he had written on paper. From Kim's notes, we also noticed that he had resorted to his Korean L1 to help him organize the writing process, and his frequent use of an electronic dictionary also supported our hypothesis that Kim had to back-translate into his L1 to generate text. From our experience as teacher-researchers in this study, we could clearly see the need to be sensitive to individual differences in order to optimize SBI.

## Implications

In addition to our findings that using graphic organizer software to teach SBI had multiple benefits for beginners in their academic writing, we were also able to draw a few lessons that may provide both research and pedagogical implications for future researchers and instructors who are interested in delving more into this topic:

### *Repeated Modeling and Practice*

One of the crucial lessons drawn from this study is that the key to SBI for beginning-level learners is repeated modeling and practice. When we taught our participants, we noticed that they did not have the language ability to understand our verbal explanation of

what strategies were and how strategies could be used. They could only observe our demonstration on using a strategy and replicate the procedure. Their first few attempts at replicating the procedure were often unsuccessful. Therefore, it is essential to allocate sufficient time to repeated teacher modeling and student practicing in order for ESL beginners to better automatize the strategy use during SBI.

***Strategy Clusters***

Even though research has shown that metacognitive strategy instruction enhances learners' self-efficacy, we observed that students had low self-efficacy when they first encountered SBI. We hypothesized that our strategy instruction would have yielded more positive results if we clustered metacognitive strategies with other LLS. This is supported by Macaro's (2001, 2006) argument that "for a strategy to be effective in promoting learning or improved performance, it must be combined with other strategies" (Macaro, 2006, p. 327). In our context, socioaffective strategies, such as the cooperative strategy and the questioning for clarification strategy, can be taught in conjunction with the planning and organizing strategies to help enhance the communications between instructors and students—which will contribute to the overall effectiveness of SBI.

***Teacher Training in Strategy Intervention***

From our experience of implementing SBI in this study, we realized that teacher assessment of strategy use was as valuable as learners' self-evaluation. For SBI to be successfully implemented, teachers should be given strategy training so that they are aware of the ultimate goal of strategy instruction, systematically executing the framework for strategy assistance designed by researchers, assessing learners' strategy use in task performance, and evaluating whether or not the goal has been attained based on the outcome of assessment (Chamot, Barnhardt, El-Dinary, & Robbins, 1999).

***Role of L1 in Strategy Instruction and Assessment***

Another valuable lesson we learned is that strategy-assessment techniques that were commonly used in previous studies—such as strategy survey, learning diary, and think-aloud protocols—are not applicable to low-achieving ESL students, who have not yet developed the English proficiency to complete these evaluation procedures. A solution to the problem, if budget allows, is either to use a questionnaire that has been translated into students' L1s, or to let students perform the think-aloud protocols in their L1s and later hire a professional interpreter to translate the protocols into English. In our case,

we created some intuitive self-evaluation techniques (e.g., "thumbs-up, thumbs-down," drawing smiley and crying faces) that required minimal language use of our ESL beginners.

Our experience of targeting beginning-level learners in SBI also made us realize why previous research would opt for more advanced-level learners in their studies (e.g., Chamot & O'Malley, 1996). Being able to speak the mother tongue of their participants or at least to have an interpreter who can translate learners' L1 has placed more cumbersome demands on researchers dealing with L2 beginners. Through our study, it dawned on us that L1 was such a crucial factor with low-proficient learners because it was the most efficient manner through which researchers could tap into learners' internal thinking process (e.g., think-aloud protocols) while they were applying strategies in language learning (Macaro, 2001, 2006).

## Limitations

Although both learners were pulled out of their regular class for remedial writing assistance with us, they were sometimes absent from our SBI sessions because of personal business. We inevitably had to shorten our SBI sessions to collect consistent data in a timely fashion to mitigate their lack of commitment or motivation to participate. Constrained by the availability of purchased software site licensing in our department, we could use only Kidspiration (grades K-5) in our SBI with the two L2 adult beginners. Even though our participants did not hold negative attitudes toward the use of Kidspiration, we would have opted for Inspiration software that is more age appropriate (grades 6-adult) for our participants if the license had been available at the outset of our research project.

Given the small sample size and the difficulty of using any type of self-report to tap into the low-proficient learners' internal mental processing, it was not our research intent to draw any generalizable conclusion (i.e., a "causal relation" between the technology-supported SBI and strategy use/writing development), but to honestly report the research findings and lessons we have learned from working with ESL beginners through technology-enhanced SBI. We hope that the findings will help us avoid the pitfalls and facilitate our future research design.

## Concluding Remarks

Even though implementing SBI with beginning-level learners is not an easy task, we still contend that it is vital to expose beginners to strategy instruction and raise their awareness of how and what type of strategies can foster their language learning. The rationale behind

this argument is that low-proficient learners are the group of learners who need the assistance of strategies the most. Our stance concurs with that of Macaro (2001, 2006), who also asserted that SBI should not be postponed until intermediate or advanced levels. In other words, beginning-level learners should not be excluded from the opportunities to become more successful learners with the use of LLS, which could motivate them to continue toward more advanced levels. However, our contention that beginning-level learners should not be spared from the benefits of SBI does not mean that we could implement it without making instructional adjustments to match the level and learning styles of such learners. From our experience as teacher-researchers in this study, we could clearly see the need to be sensitive to individual differences in order to optimize our strategy assistance and lower the risk of unforeseen pitfalls of strategy intervention that we encountered.

Our study revealed that using graphic organizer writing software to teach metacognitive planning and organizing strategies can help beginning-level ESL students become better strategy users and more efficient writers. We believe that with repeated in-class modeling and practicing, and creation of self-evaluation methods that are tailored to low-achieving students, SBI supported by multimedia writing software can benefit adult ESL students—even absolute beginners.

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**Notes**

[1]See Macaro (2006) for a comprehensive review of this research area.

[2]Pseudonyms were chosen for the two participants to protect their confidentiality.

[3]Kidspiration (Inspiration Software) was incorporated in this study for its hands-on graphic organizer feature that helped in facilitating the instruction of planning and organizing strategies during the writing process.

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## Appendix

***Kim's Pretest Writing Sample***

Author is my special teacher. She is from China and she's 27 old. She like watching movie and listen to music and reading book. So she's very smart. Sometimes she cooking chiness food or korean food. But she dislike American jung food. For example hamburger and pizza etc. Author want to great university teacher. So she hard studying.

***Kim's Posttest Writing Sample***

The last month I went to Canada for my friends. College Park from Nigara fall until then hour and 750 miles. This is very long distance. So I was first experience. Because Korea is a small. I think USA is very beautiful for the highway. Ten hour drive at the end, arrival the Niagar falls. My impression is bad because long time driving and this day so cold and cloudy. Niagara falls is very big sightseeing. So there is many restaurant and hotel. I think about there is price commonness. However I don't find good restaurant and hotel.