

## The Effects of Self-Regulated Strategy Development (SRSD) Writing Instruction on the English Writing Ability for College Students with Disabilities\*

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This study investigated the effects of SRSD writing instruction on the English writing ability by multiple probe design across students. This study examined the expository comprehension and informative writing performance of three low-achieving college students with disabilities, specifically hearing impairments, following Self-Regulated Strategy Development (SRSD) instruction for TWA (Think before reading, think While reading, think After reading) and PLANS (Pick goals, List ways to meet goals, And make Notes and Sequence notes). Student performance, as measured by written summaries of designated texts, improved and was maintained following instruction. Students also took to the strategies used as well as instruction given, and believed that TWA & PLANS improved their reading and writing in English.

SRSD has had significant and meaningful effects among students with disabilities in college settings. In this study, examples of SRSD writing instruction aimed at improvements in the length and quality of writing in English are described. Promising findings of recent research focussed on college students with disabilities are also highlighted. In addition, suggestions for the implementation of an effective learning strategy for college students with disabilities are provided. Finally, the possible limitations of this study and the potential direction of future research are presented.

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**Key Words** : *SRSD, writing, college students with disabilities, hearing impairment*

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## I. Introduction

### 1. Purpose of the Study

When writing abilities are not well developed, students cannot draw on the power of writing to support and extend learning and development, and adults with inadequate writing skills face significant barriers to further education and employment (Harris, Graham, & Adkins, 2014). Many students with hearing impairment have academic writing problems and suffer a negative experience in adapting to the school environment (Kwon, 2011). Increasing numbers of students with hearing impairment are attending colleges and universities upon completion of high school by special education laws for students with disabilities and others in 2007 (Park, Lee, & Lim, 2008; Ministry of Education, 2013). As of the 2013 academic year, an estimated 950 students with hearing impairment were enrolled in colleges in Korea (Ministry of Education, 2013). The transition to university can be a stressful experience for many college students with disabilities, because one of the important challenges for them is the need to develop learning habits and to adjust their learning strategies to be successful in their new academic environment (Julia & Veni, 2012). In Korea, 30% of students with disabilities has been placed under academic sanction (Kim, 2004; Kim & Kim, 2006), having had difficulties in adjusting to college to the extent of requiring leaves of absence or dropping out (Kim, 2001; Suk & Kang, 2005). One of the primary reasons for dropping out and suffering academic sanction is the academic difficulties of students with disabilities (Kwon, 2005; Cho & Son, 2013). College students with disabilities also experience more difficulty in adapting to academic, emotional, and social changes than students without disabilities (Kim, Park, & Lee; 2003). As a result, college students with disabilities are graduating from institutions of higher education at lower rates than their peers without disabilities (Murray, Goldstein, Nourse, & Edgar, 2000). Ultimately, college students with disabilities have problems in terms of college life (Kim et al., 2006) as well as the basic skills needed for learning and for reading in order to perform written tasks related to their major and English Medium Instruction (EMI) as a foreign language (Cho & Son, 2013). Therefore, it is important to help them to adapt to college in an appropriate way, with a suitable level of learning supports (Cho & Son, 2013).

Recently, many universities have been trying to change in this respect and to become global leaders in terms of inclusiveness. For example, Korean universities have increased the number of EMI lectures in order to allow students to gain both specialized knowledge and enhanced English ability (Jin & Kim, 2013). And there has been increased interest in integrating the instruction of reading and writing in college composition classes for nonnative learners (Lee, 2000; Carson, 2001; Park et al., 2008). College students with disabilities have experienced an increase in the number of learning problems such as subject matter comprehension and task execution because of the increased prevalence of EMI, but empirical research has not been conducted on EMI for college students with disabilities (Mason & Graham, 2008). Also, colleges don't have learning support for individual English programs according to the type of disability in question. Specifically, the challenges students with hearing impairment face should be addressed in order to facilitate an increase in the effectiveness and efficiency of the language input (Park et al., 2008). One of the sources of challenge for the students with hearing impairment is that they are often learning to read and write in English while simultaneously developing a language for communicative purposes (Dostal et al., 2014). Researchers has noted, the students writing often persistently contains simplified sentences, grammatical errors or non-standard usages, typical shorter, less complex and sentences that are comprised of repetitions of basic grammatical patterns and the introduction of new topics without full development of ideas (Mayer, 2010; Dostal et al., 2014; Singleton et al., 2004). To elaborate, students with hearing impairment have a high attrition rate from post-secondary educational institutions (Boutin, 2008), and up to 75% of deaf and hard of hearing students fail to complete college (U.S. Department of Education, 1999) and has problems about learning adjustment from low reading and writing skills and phonetics problems (Kwon, 2005; Park et al., 2008; Huh & Lee, 2011; Kwon, 2011)

Park et al. (2008) investigated the English lexical ability of hearing impaired university students, demonstrating that they have difficulty in learning English. Researchers have described specific difficulties apparent in the writing skills such as poor organization, poor spelling, haphazard punctuation, and clumsy or repetitive syntactic structures of college students with learning difficulties (Kwon, 2011). Skilled writing is complex, requiring the extensive self-regulation of a flexible, goal-directed, problem-solving activity. During this process, the students build their understandings of grammars of English through explicit

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discussion of the languages and language equivalence. When students have difficulty communicating their ideas in English due to an expressive language delay, the teacher will use a variety of techniques such as drawing pictures, inserting pictures, using objects, using gesture, or role play to arrive at a point of common understanding (Dostal et al, 2014). Thus, teacher instruction model ways of expressing the ideas in SRSD, and expressive language development becomes the initial focus of instruction prior to English writing.

SRSD has been found to have positive effects on the work of student writers (Graham, Harris, & MacArthur, 2006). SRSD was explicitly designed to address the complex nature of writing and the difficulties most students experience in learning to write. SRSD instruction includes the explicit, interactive learning of strategies for genre specific and general writing, the knowledge needed to use these strategies, and techniques for self-regulating strategy use and writing behavior throughout the writing process. Students who struggle with writing lack the self-monitoring and goal-setting abilities that experienced writers use to navigate the writing process.

Researchers have established the effectiveness of SRSD instruction for students with learning disabilities and other struggling writers in over 40 studies conducted over the past 25 years (Mason, Harris, & Graham, in press). Findings from this research indicate that SRSD meaningfully improves what students write, how students write, and how students perceive the writing process. The positive effects of SRSD instruction have been clearly established for elementary through high school grades, in both self-contained and inclusive classrooms, and with one-to-one, small group, and whole class instruction. In recent studies, SRSD instruction has also shown positive effects for students with a range of disabilities (Mason, & Shriener, 2008; Mason, Harris, & Graham, 2011). Although these studies have proved the effectiveness of SRSD among students with disabilities, there is still a limitation in the number of studies. Specifically in Korea, only a few intervention studies like CBI(content-Based Instruction) strategies have been conducted EMI setting in college (Shim, 2012). And the effects of SRSD intervention studies need for common disability group as LD, ADHD (Jin, 2011). Therefore, more studies across participants, settings and genres are needed.

According to the previous studies, adjustment to college students with hearing impairment was related to various academic factors such as reading and

writing skills, learning strategies (Lent et al., 2009; Dostal et al., 2014). Specifically, several researchers reported that reading and writing skills are important factors to the academic achievement in college (Park et al., 2008; Kwon, 2011). In addition, some researchers found that college students with hearing impairment have academic difficulty in college such as dropout and under academic prohibition (Kim, 2001; Suk et al., 2005; Kwon, 2011). Therefore, in this study, the college students with hearing impairment would show the effects of SRSD writing instruction in writing ability for college students with disabilities.

## 2. Research Questions

The purpose of this study is to investigate the effects of SRSD writing instruction on the English writing ability of college students with hearing impairment. It has a multiple probe design, and examines the effectiveness of SRSD (Harris & Graham, 1996) instruction in terms of a multiple- strategy approach to expository informative writing for students with disabilities who are at risk of failure in their major courses. The study asked the following research questions:

- 1) Is the SRSD writing instruction effective to improve English writing quantity of college students with hearing impairment?
- 2) Is the SRSD writing instruction effective to improve English writing quality(i.e., process of planning, contents, organization, expressive writing) of college students with hearing impairment?

## II. METHOD

### 1. Participants

Three college students with disabilities identified as having learning difficulties participated in this study. All participants were receiving support through the school's disability support service program. Confirmation of the participants' classification as having learning difficulties occurred prior to

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performance of the study with the assistance of on-campus disability support service personnel. Participants who has under-achievement hearing-impaired were recruited with the assistance of the on-campus disability support service office. The students classified as hard of hearing is 80–120 decibels (dB). Students were chosen as eligible for participation who met the following criteria: (a) had gained special college admission for students with disabilities; (b) attended EMI classes in college as a result of difficulty in reading and writing; (c) were assigned to Academic English level 1 in liberal arts when they were freshman which means beginning level in the English Language Proficiency program; (d) showed low GPA in college; (e) utilize reading and writing support devices for those with disabilities; (f) did not receive any learning strategy instruction before; (g) signed to a consent form to participate in this research. All participants had not received any specialized education service before in order to become college students. The characteristics of each participant are described in the following.

<Table II-1> Characteristics of Participants

Name	Student A	Student B	Student C
Gender	Female	Female	Female
Year	Junior	Sophomore	Sophomore
Major	Engineering	Political Science & Economics	Engineering
Type of Disability	Hearing impairment	Hearing impairment	Hearing impairment
Causes of Disability	Inborn	Inborn	Inborn
Hearing Aid	Wear	Wear	Wear
Hearing Loss (dB)	80	96	115
Grade of Disability	3	3	2
GPA in last year	2.06	0.50	1.56
Total GPA	2.84	1.8	1.94
Academic Characteristic	Academic English level 1, Difficulties in Science	Academic English level 1, Academic probation 2, Leave of absence 2,	Academic English level 1

## 2. Independent Variables

The independent variable of this study was SRSD writing instruction. TWA&PLANS strategy (Mason et al., 2006) was selected for informative writing. It prompted students to guide what to do before, while, and after reading & writing, and the mnemonic TWA+PLANS helped students to remember the steps of the strategy. <Table II-2> shows fourteen steps of TWA&PLANS strategy.

<Table II-2> The Steps of TWA & PLANS strategy

Strategy		Steps
Reading	T (Think before reading)	The author' s purpose
		What you know
		What you want to learn
	W (think While reading)	Reading speed
		Linking Knowledge
		Rereading parts
	A (After reading)	The main idea
		Summarizing information
		What your learned
Writing	P	Pick goals
	L	List ways to meet goals
	A	And
	N	Make Notes
	S	Sequence notes

The TWA+PLANS instructor have followed procedures fundamental to the SRSD approach. Lessons have focused, structured, explicit, and individualized to address the cognitive, affective, and behavioral characteristics of each student (Harris et al., 2003). Six strategy acquisition stages fostered student attainment of strategy usage: develop background knowledge, discuss the strategy, model the strategy, memorize the strategy, guided practice, and independent practice. Lessons have included direct instruction in self-regulating learning through self-instruction, goal setting, self-monitoring, and self-reinforcement (Harris et al., 2008).

### 3. Research Design

A single-subject multiple probe design (Horner & Baer, 1978; Tawney, Gast, & Skouge, 1984) across subjects were used to determine the effectiveness of instruction in the SRSD on the ability of college students with disabilities to summarize important information. A multiple probe design allows researchers to determine a functional relationship between independent and dependent variables when using small numbers of subjects in a study. A multiple probe design across subjects were employed to evaluate student English writing before and after instruction for the effects of the intervention. Baseline performance for each student was collected prior to instruction. This experiment was conducted through the baseline, intervention, and maintenance phase.

### 4. Procedure

Researcher selected knowledge and informative text topics from reading package, 500-600 words in length, same level text in each sessions, of Test Of English as a Foreign Language (TOEFL) text book. The TOEFL text book was academic English for college students(Shim, 2012). The reason of selecting those topic areas was that social studies and science studies included various information and knowledge and similar to college textbook. The textbook was integrated task for writing based on reading. The independent variable of this study was SRSD writing instruction by TWA&PLANS strategy (Mason et al., 2006).

#### 1) Baseline

During the baseline phase, from three to eight probes were collected from each participant. Participants read the text prompt and wrote the summarize. Before the intervention phase begin, a minimum of three continuous baseline probes were administrated until the student's performance were stable. All learning strategies and reinforcement were excluded in this phase.

## 2) Intervention

After the collection of initial baseline data, each of the three students who participated in the study received instruction in the TWA&PLANS strategies (Mason et al., 2006) from the instructor. All students were received of one-to-one instructional sessions for reason of needed additional practice and feedback or whose schedule necessitated meeting times that could not be coordinated with other subjects. During the course of the study, instructional materials were used that are provided in the Hacker TOEFL writing manuals.

The participants mastered the TWA&PLANS strategy through the planned procedures. First, the researcher introduced the definition and purposes of TWA&PLANS strategy so that students could understand what this strategy was, why it is important, and when they could use it. And then, the researcher explained each step of the strategy and modeled how to use it, using self-statements. For guided practice, students planned and brainstormed with the researcher collaboratively, and then they wrote the summary. After the summary was complete, the instructor prompted the student to reread the writing to make sure whether it includes all summary elements and they went through all steps. After the writing completed, they evaluated their writing with a checklist. Lastly, students wrote the summary independently, using the writing strategy. Instruction continued until the student met the criterion level – independently writing. Each session was taught for 50~60 minutes after school by the researcher. All students participated in two sessions a week.

## 3) Maintenance

The researcher established two times maintenance phases for examining the maintenance of the intervention effect in relation English writing. The probes were completed under the same conditions as in the baseline phase and participants wrote about the given text. Measuring the first maintenance probes were conducted in two weeks after the end of the intervention phase for each participant. And the second maintenance probe were conducted in four weeks.

<Table III-3> Procedure of SRSD writing instruction

Procedure	Session	Intervention	
		Instruction	Activity
Baseline	3~8	<ul style="list-style-type: none"> <li>- No feedback</li> <li>- No reinforcement</li> </ul>	<ul style="list-style-type: none"> <li>- Give each student a reading text and ask reading and writing for summarizing in the passage</li> </ul>
Instruction	3	<ul style="list-style-type: none"> <li>- Introduce the strategies</li> <li>- Establish prior performance and set goals</li> <li>- Model the strategy and establish self-instruction</li> <li>- Collaborative practice</li> <li>- Guided practice</li> </ul>	<ul style="list-style-type: none"> <li>- Introduce TWA+PLAN strategy</li> <li>- Memorize TWA+PLAN</li> <li>- Goal Setting of text</li> <li>- Write the TWA self-statement sheet</li> <li>- Summaries for each paragraph</li> <li>- Strategy practice with teacher</li> <li>- Confirmation procedure</li> </ul>
Intervention	10	<ul style="list-style-type: none"> <li>- Independent Performance</li> </ul>	<ul style="list-style-type: none"> <li>- Summaries for each paragraph</li> <li>- Graph performance</li> </ul>
Maintenance	4	Generalization	

## 5. Measures

The dependent variables of this study were English writing ability. The data collection was conducted each session by outline and summary to text during the baseline, intervention and maintenance but not collected during instruction.

### 1) Writing Length

The number of written words were counted. Even though all words spelled correctly are counted, nonfunctional texts which were unrelated to the writing topic were excluded. One point per word was given as score. To check the reliability of scoring, the sample of functional and nonfunctional texts were given to two graduate students to score independently.

### 2) Writing Quality

The writing quality was scored using a holistic measure, which is the most common procedure for scoring writing quality based on the advanced

research and TOEFL writing text manuals (Graham & Perrin, 2007; MacArthur & Philippakos, 2010; Jung & Kim, 2011). With this method, raters read each paper attentively to obtain a general impression of overall writing quality. This qualitative measure had four categories: process of planning(4 scores), contents(12 scores), organization(9 scores) and expressive(15 scores) writing. Papers were scored using a 0- to 1-point or 3-point Likert-scale ranging from 0 to 40, with higher scores representing higher quality writing. Writing quality was scored by 2 English language teachers who were unfamiliar with the design and intent of the study. The raters received extensive training in applying the holistic scoring system.

## 6. Interrater Reliability

In order to measure reliability of measuring the students' writing ability, English language teacher scored 10 summaries among 22 summaries with rubric. Before scoring the summary, two graduate students were trained by the researcher on the methods of scoring. Two raters practiced scoring until 80% reliability was achieved (Reid & Lienemann, 2006). After completing scoring, total of agreements and disagreements was divided into the number of agreement, and then multiplied by 100. The mean percentage of interrater agreement on writing quantity was 100 for all of students. The mean percentage of interrater agreement for writing quality was 92.3.

$$\text{Interrater Reliability (\%)} = \frac{\text{Agreements for the trial}}{\text{Agreements for the trial} + \text{Disagreements for the trial}} \times 100$$

<Table III-4> Interrater Reliability on Writing Quality (%)

Student	Baseline	Intervention	Maintenance (Follow-up)
A	94	92	99
B	88	92	96
C	92	84	94

## 7. Social Validity

The measure of social validity was conducted with the students for satisfaction of the intervention. To obtain students' intervention satisfaction, the researcher used the student writing questionnaire. In addition to the rating scales, SRSD researcher interviewed students post-intervention to determine treatment acceptability. Interview questions were (a) If you were the teacher would you teach TWA and the PLANS strategy to your students? Why or why not? (b) If you did teach TWA and the PLANS strategy to students, what would you do the same? (c) What would you do differently? (d) What did you like or not like about TWA? (e) What did you like or not like about the PLANS strategy? (f) What did you like or not like about the text? (g) What did you like or not like about having self-statements? (h) Where can you use TWA and what can TWA help you do? (i) Where can you use the PLANS strategy and what can the PLANS strategy help you do? and (j) Where can you use your self-statements that you have chosen, and what can your self-statements help you with?

All of the participants were questioned about the overall satisfaction of SRSD writing strategy. The students were asked how this instruction influenced their writing ability and whether they would use this strategy to write summarize. The students responded that SRSD writing instruction was very helpful for improvement interest in reading and writing skills and use it self-directed in lectures.

## 8. Intervention Fidelity

For intervention fidelity, all procedures of intervention were administered according to the lesson plans by researcher and the researcher checked if the intervention was well going on by the fixed steps on a checklist during the intervention phrase. In addition, random 3 sessions of the 10 intervention sessions from each students were observed by the English language teacher, and she assessed items as they were performed by the researcher (Lienemann & Reid, 2008) and by recording the presence or absence of each instructional component. As a result of measuring intervention fidelity by the observer, fidelity was 100%.

$$\text{Intervention fidelity (\%)} = \frac{\text{the number of observed instruction procedure}}{\text{the number of planned instruction procedure}} \times 100$$

## IV. Results

### 1. Research Question 1 : Effects on Writing Quantity

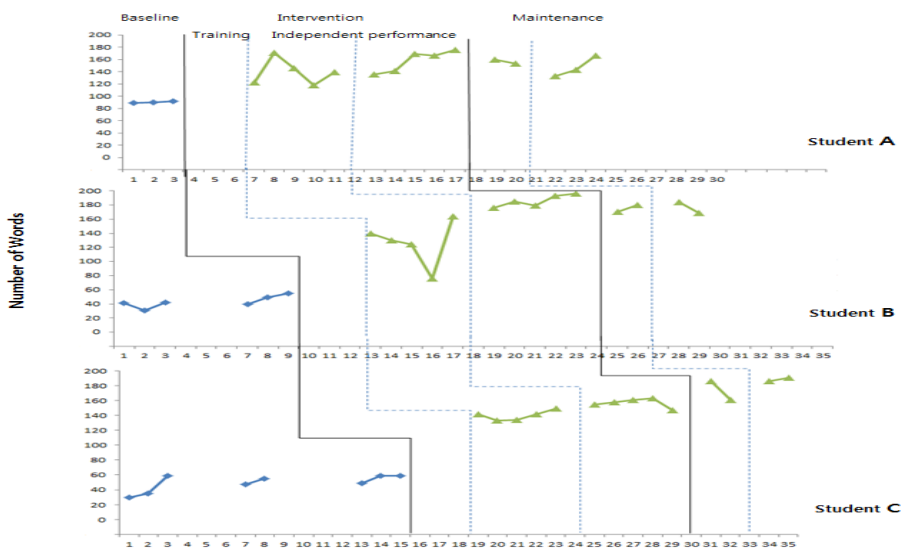
The Student A had mean number of words of 90.3 with a range of 89 to 92 during the baseline. During the intervention phase, Student A displayed mean number of words of 148.5 words with a range of 118 to 176 correlating to increases of 164.4%, which mean that a marked increase in summary length occurred. The visual analysis during the baseline indicated a stable slope with a trend. The visual analysis during the intervention indicated a positive slope with a moderate upward trend and cyclical pattern with high variability. PND(percent of non-overlapping data) points were calculated at 100% between baseline and intervention, which means that the intervention was very high effective and English writing length had improved over baseline. During the maintenance phase, the mean number of words was 151 with range of 133 to 166 correlating to increases of 101.6%, which means that an increase in summary length continued. The visual analysis during the maintenance indicated a positive slope with a moderate upward trend and cyclical pattern with high variability. PND data points were calculated at 100% between baseline and maintenance. The Student B had mean number of words of 43 with a range of 31 to 55 during the baseline. During the intervention phase, Student B displayed mean number of words of 156.3 words with a range of 76 to 196 correlating to increases of 363.4%, which mean that a marked very increase in summary length occurred. The visual analysis during the baseline indicated a stable slope with a trend. The visual analysis during the intervention indicated a negative slope with a low downward trend and cyclical pattern with high variability. PND data points were calculated at 100% between baseline and intervention, which means that the intervention was very high effective and English writing length had improved over baseline. During the maintenance phase, the mean number of words was 175.7 with range of 169 to 184 correlating to increases of 112.4%, which means that an increase in summary length continued. The visual analysis during the maintenance indicated a negative slope with a low downward trend and cyclical pattern with high variability. PND data points were calculated at 100% between baseline and maintenance. The Student C had mean number of words of 49.1 with a range of 30 to 59 during the baseline. During the intervention phase, Student C displayed mean number of words of 148.4 words with a range of 133 to 163 correlating to increases of 302.2%, which mean that a marked increase in

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summary length occurred. The visual analysis during the baseline indicated a stable slope with a trend. The visual analysis during the intervention indicated a positive slope with a moderate upward trend and cyclical pattern with high variability. PND data points were calculated at 100% between baseline and intervention, which means that the intervention was very high effective and English writing length had improved over baseline. During the maintenance phase, the mean number of words was 181 with range of 161 to 191 correlating to increases of 121.9%, which means that an increase in summary length continued. The visual analysis during the maintenance indicated a positive slope with a moderate upward trend and cyclical pattern with high variability. PND data points were calculated at 100% between baseline and maintenance. <Table IV-1> shows the mean number of words according to each of the phases, and [Figure IV-1] presents the number of words according to each of the sessions for each participant.

<Table IV-1> Mean Number of Words (Range 30–196 words)

	Baseline	Intervention	Maintenance (Follow-up)
Student A	90.3 (range 89–92)	148.5 (range 118–176)	151 (range 133–166)
Student B	43 (range 31–55)	156.3 (range 76–196)	175.7 (range 169–184)
Student C	49.1 (range 30–59)	148.4 (range 133–163)	181 (range 161–191)



<Figure IV-1> Number of Words of the Participants

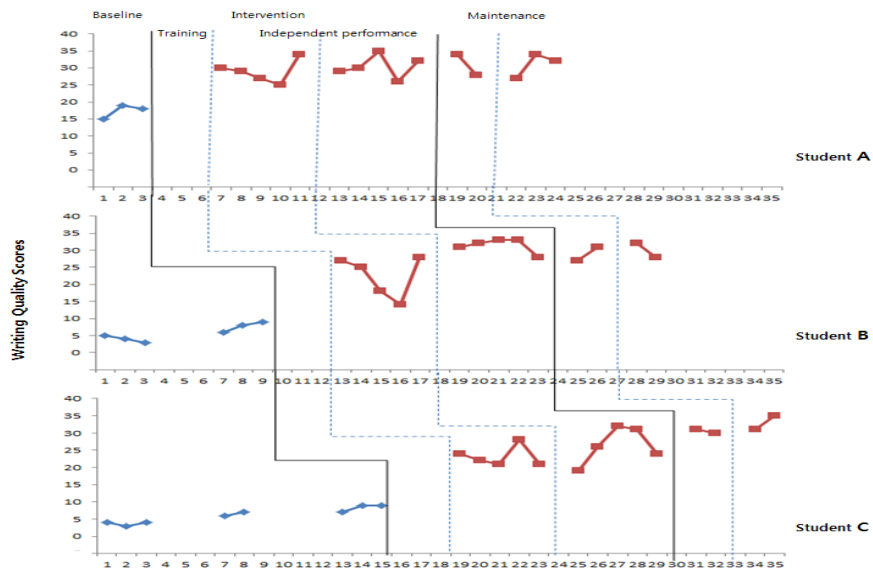
## 2. Research Question 2 : Effects on Writing Quality

The writing quality ratings of all student's summary improved considerably following the intervention. The improvement continued during the maintenance. The Student A had mean points of 17.3 with a range of 15 to 19 during the baseline. The visual analysis during the baseline indicated a stable slope with a moderate upward trend. During the intervention phase, Student A displayed mean points of 29.7 with a range of 25 to 35 correlating to increases of 171.6%, representing a positive slope with a low upward trend and cyclical pattern with high variability. PND data points were calculated at 100% between baseline and intervention, which means that the intervention was very effective and English writing quality had improved over baseline. During the maintenance phase, the mean points of writing quality was 31 with range of 27 to 34 correlating to increases of 104.3%, which means that an increase in writing quality continued. The visual analysis during the maintenance indicated a positive slope with a low upward trend and cyclical pattern with high variability. PND data points were calculated at 100% between baseline and maintenance. The Student B had mean points of 5.8 with a range of 3 to 9 during the baseline. The visual analysis during the baseline indicated a stable slope with a moderate upward trend. During the intervention phase, Student B displayed mean points of 26.9 with a range of 14 to 33 correlating to increases of 463.7%, representing a positive slope with a moderate (high) upward trend and cyclical pattern with high variability. PND data points were calculated at 100% between baseline and intervention, which means that the intervention was very effective and English writing quality had improved over baseline. During the maintenance phase, the mean points of writing quality was 29.5 with range of 15 to 19 correlating to increases of 109.6%, which means that an increase in writing quality continued. The visual analysis during the maintenance indicated a positive slope with a low upward trend and cyclical pattern with high variability. PND data points were calculated at 100% between baseline and maintenance. The Student C had mean points of 6.1 with a range of 3 to 9 during the baseline. The visual analysis during the baseline indicated a stable slope with a moderate upward trend. During the intervention phase, Student C displayed mean points of 24.8 with a range of 19 to 32 correlating to increases of 406.5%, representing a positive slope with a moderate upward

trend and cyclical pattern with high variability. PND data points were calculated at 100% between baseline and intervention, which means that the intervention was very effective and English writing quality had improved over baseline. During the maintenance phase, the mean points of writing quality was 31.7 with range of 30 to 35 correlating to increases of 127.8%, which means that an increase in writing quality continued. The visual analysis during the maintenance indicated a positive slope with a low upward trend and cyclical pattern with high variability. PND data points were calculated at 100% between baseline and maintenance. <Table IV-2> shows the mean points of writing quality scores in each of the phases, and <Figure IV-2> presents the change of writing quality scores in each of the sessions for each participant.

<Table IV-2> Mean Points of Writing Quality (Range 3-35 scores)

	Baseline	Intervention	Maintenance (Follow-up)
Student A	17.3 (range 15-19)	29.7 (range 25-35)	31.0 (range 27-34)
Students B	5.8 (range 3-9)	26.9 (range 14-33)	29.5 (range 15-19)
Student C	6.1 (range 3-9)	24.8 (range 19-32)	31.7 (range 30-35)



<Figure IV-2> Writing Quality Total Score

1) Process of Planning

The 4 items were scored using a 0- to 1- level Likert-scale. <Table IV-3> shows the average of the process of planning in each phase and [Figure IV-3] presents the change of the process of planning before, intervention and after invention.

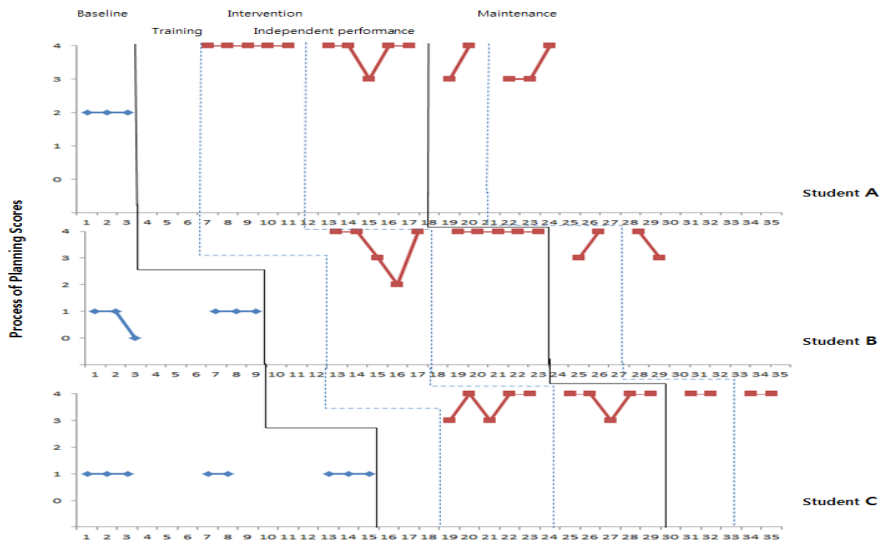
<Table IV-3> Mean of Process of Planning Scores (Range 0-4 scores)

	Baseline	Intervention	Maintenance (Follow-up)
Student A	2.0 (range 2)	3.9 (range 3-4)	3.4 (range 3-4)
Student B	0.8 (range 0-1)	3.7 (range 2-4)	3.5 (range 3-4)
Student C	1.0 (range 1)	3.7 (range 3-4)	4.0 (range 4)

As <Figure IV-3> shows, all students mastered the TWA&PLANS strategy after the training. During the baseline phase, Student A displayed low moderate levels of process of planing, with a mean 2.0. During the intervention phase, mean levels of process of planning increased noticeably, meaning there was a high rapidity of change from baseline to intervention. For student A, the mean levels of process of planning increased from 2.0 to 3.9 during the intervention, which was an improvement of 195%. During the maintenance phase for process of planning, mean levels of process of planning decreased from 3.9 to 3.4, which was a change of 87%. Student B displayed low levels of process of planing, with a mean 0.8. And the mean levels of process of planning increased from 0.8 to 3.7 during the intervention, which was an improvement of 463%. During the maintenance phase for process of planning, mean levels of process of planning decreased from 3.7 to 3.5, which was a change of 95%. Student C displayed low levels of process of planing, with a mean 1.0. And the mean levels of process of planning increased from 1.0 to 3.7 during the intervention, which was an improvement of 370%. During the maintenance phase for process of planning, mean levels of process of planning increased from 3.7 to 4.0, which was a change of 108%.

In common, the student did that they felt difficulty in writing planning. The Students could not write any plan during the baseline phase. It seemed that they were lack of integrated and critical thinking for summarize. However,

they wrote more planned after the training by mastering all strategy steps. This demonstrated that the effects of the intervention had been maintained throughout the entirety of the maintenance phases and the intervention was very high effective and English writing process of planning had improved.



<Figure IV-3> Process of Planning Score

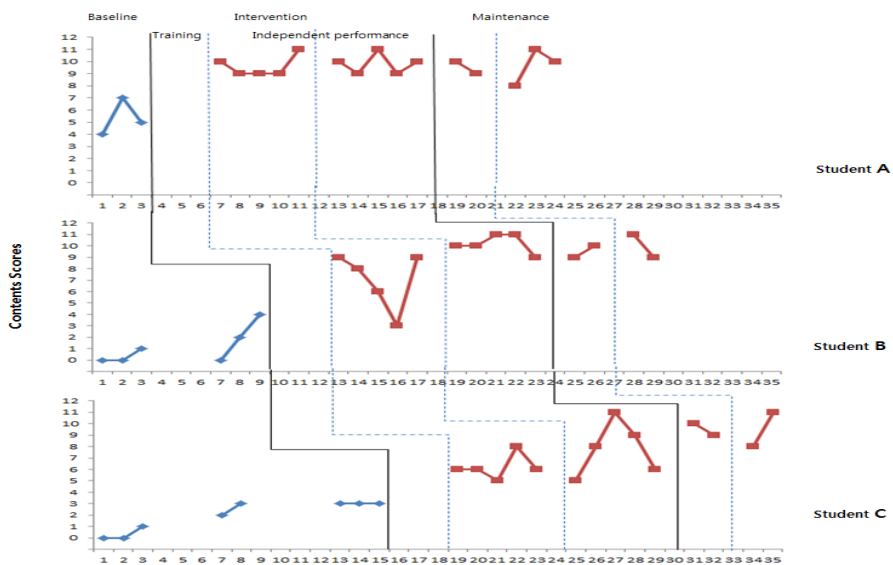
2) Contents

The 4 items were scored using a 0- to 3- level Likert-scale. During the baseline phase, Student A displayed moderate levels of contents, with a mean 5.3. During the intervention phase, mean levels of process of planning increased noticeably, meaning there was a high rapidity of change from baseline to intervention. For student A, the mean levels of contents increased from 5.3 to 9.7 during the intervention, which was an improvement of 183%. During the maintenance phase for content mean levels of process of planning decreased from 9.7 to 9.6, which was a change of 99%. Student B displayed very low levels of contents, with a mean 1.1. And the mean levels of contents increased from 1.1 to 8.6 during the intervention, which was an improvement of 782%. During the maintenance phase for contents, mean levels of contents increased from 8.6 to 9.7, which was a change of 113%. The visual analysis during the intervention indicated a positive slope with a

low upward trend and cyclical pattern with high variability. Student C displayed low levels of contents, with a mean 1.8. And the mean levels of contents increased from 1.8 to 7.0 during the intervention, which was an improvement of 389%. During the maintenance phase for contents, mean levels of contents increased from 7.0 to 9.5, which was a change of 136%. After the instruction, all of three students' contents of writing quality increased. Specifically, student B increased her contents of writing quality dramatically during and after the intervention with and without support. This demonstrated that the effects of the intervention had been maintained throughout the entirety of the maintenance phases and the intervention was very high effective and English writing contents had improved.

<Table IV-4> Mean of Contents Scores (Range 0-11 scores)

	Baseline	Intervention	Maintenance (Follow-up)
Student A	5.3 (range 4-7)	9.7 (range 9-11)	9.6 (range 8-11)
Student B	1.1 (range 0-4)	8.6 (range 3-11)	9.7 (range 9-11)
Student C	1.8 (range 0-3)	7.0 (range 5-11)	9.5 (range 8-11)



<Figure IV-4> Contents Scores

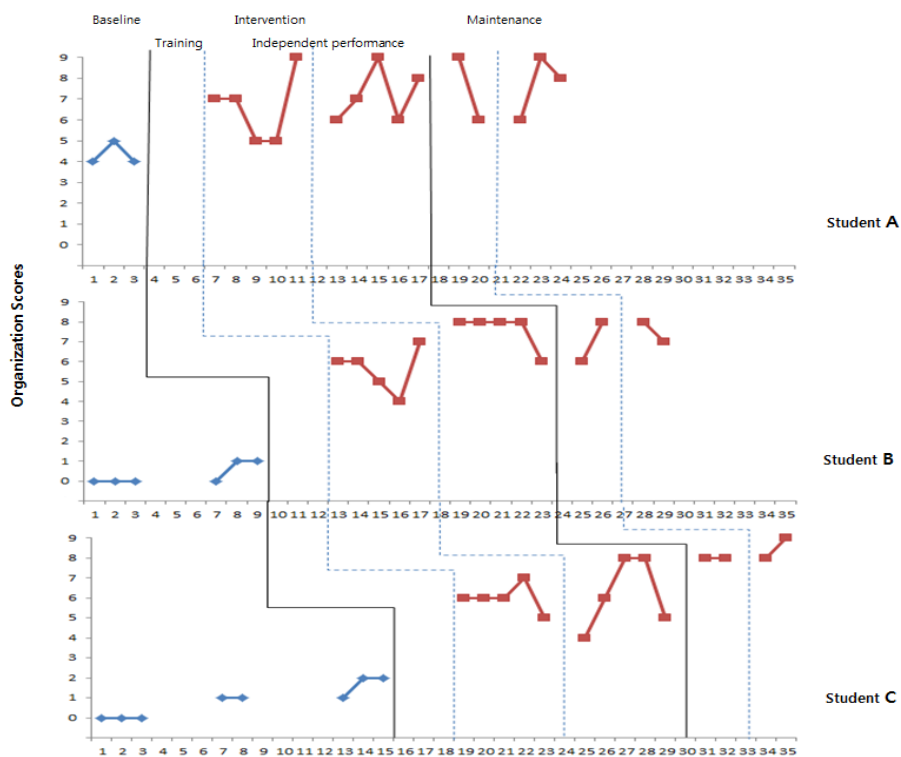
### 3) Organization

During the baseline phase, Student A displayed moderate levels of organization, with a mean 4.3. During the intervention phase, mean levels of organization increased noticeably, meaning there was a rapidity of change from baseline to intervention. For student A, the mean levels of organization increased from 4.3 to 6.9 during the intervention, which was an improvement of 160%. PND data points were calculated at 80% between baseline and intervention. During the maintenance phase for organization, mean levels of organization increased from 6.9 to 7.6, which was a change of 110%. The visual analysis during the intervention indicated a positive slope with an upward trend and low variability.

Student B displayed very low levels of organization, with a mean 0.3. And the mean levels of organization increased from 0.3 to 6.6 during the intervention, which was an improvement of 2,200%. The intervention phase was a rapidity of change from baseline to intervention. During the maintenance phase for organization, mean levels of organization increased from 6.6 to 7.2, which was a change of 109%. The visual analysis during the intervention indicated a positive slope with a high upward trend and cyclical pattern with high variability. Student C displayed low levels of organization, with a mean 0.8. And the mean levels of organization increased from 0.8 to 6.1 during the intervention, which was an improvement of 763%. During the maintenance phase for organization, mean levels of organization increased from 6.1 to 8.2, which was a change of 134%. After the instruction, all of three students' organization of writing quality very highly increased. Specifically, student B not only contents but also organization increased dramatically during and after the intervention with and without support. In common, the student did that they felt difficulty in writing organization. The students did not understand organization of reading text during the baseline phase. It seemed that they were lack of logical and critical thinking for summarize. However, they wrote more understood after the training by mastering all strategy steps. This demonstrated that the effects of the intervention had been maintained throughout the entirely of the maintenance phases and the intervention was very high effective and English writing organization had improved.

<Table IV-5> Mean of Organization Scores (Range 0-9 scores)

	Baseline	Intervention	Maintenance (Follow-up)
Student A	4.3 (range 4-5)	6.9 (range 5-9)	7.6 (range 6-9)
Student B	0.3 (range 0-1)	6.6 (range 4-8)	7.2 (range 6-8)
Student C	0.8 (range 0-2)	6.1 (range 4-8)	8.2 (range 8-9)



<Figure IV-5> Organization Score

#### 4) Expressive writing

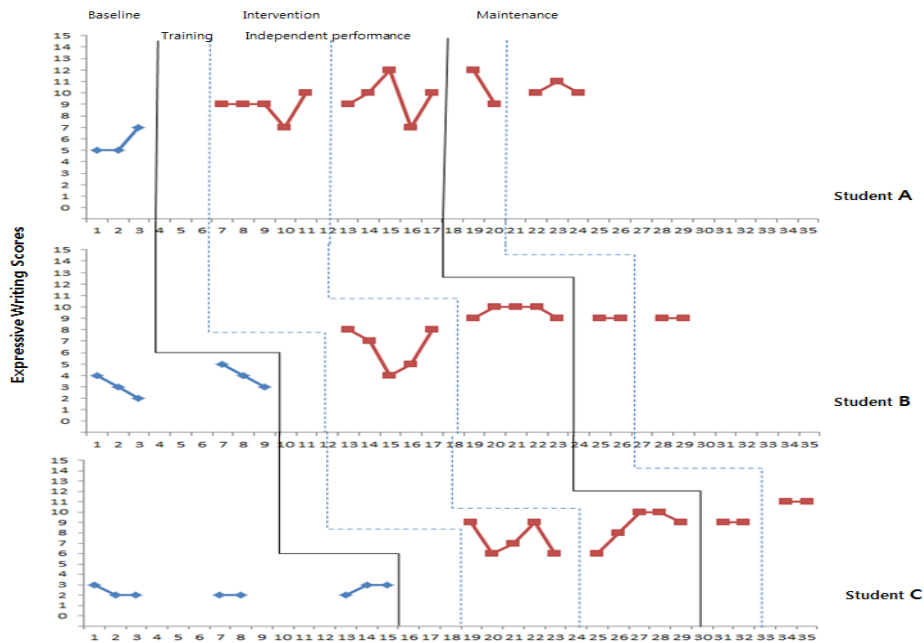
During the baseline phase, Student A displayed moderate levels of expressive writing, with a mean 5.6. During the intervention phase, mean levels of expressive writing increased noticeably, meaning there was a

rapidity of change from baseline to intervention. For student A, the mean levels of expressive writing increased from 5.6 to 9.2 during the intervention, which was an improvement of 164%. PND data points were calculated at 80% between baseline and intervention. During the maintenance phase for expressive writing, mean levels of expressive writing increased from 9.2 to 10.4, which was a change of 113%. The visual analysis during the intervention indicated a positive slope with an low upward trend and low variability. Student B displayed very low levels of expressive writing, with a mean 3.5. And the mean levels of expressive writing increased from 3.5 to 8.0 during the intervention, which was an improvement of 229%. The intervention phase was a high rapidity of change from baseline to intervention. PND data points were calculated at 80% between baseline and intervention.. During the maintenance phase for expressive writing, mean levels of expressive writing increased from 8.0 to 9.0, which was a change of 113%. The visual analysis during the intervention indicated a positive slope with a upward trend and cyclical pattern with high variability. PND data were represented 100% between baseline and maintenance. Student C displayed low levels of expressive writing, with a mean 2.3. And the mean levels of expressive writing increased from 2.3 to 8.0 during the intervention, which was an improvement of 348%. During the maintenance phase for expressive writing, mean levels of expressive writing increased from 8.0 to 10.0, which was a change of 125%. The PND data were represented 100% between baseline and maintenance.

After the instruction, all of three students' expressive writing of writing quality very highly increased. Specifically, student C increased her expressive writing dramatically during and after the intervention with and without support. Like these, all students improved writing quality ratings and maintained the effects during maintenance phase. Although the students showed differently scores in writing skills, they showed problems in process of planning, contents, organization and expressive writing during the baseline. During the intervention, they showed gradual improvements in writing quality. This means that SRSD writing instruction has positive effects on students' English writing quality.

<Table IV-6> Mean of Expressive writing Score (Range 2-12 scores)

	Baseline	Intervention	Maintenance (Follow-up)
Student A	5.6 (range 5-7)	9.2 (range 7-12)	10.4 (range 9-12)
Student B	3.5 (range 2-5)	8.0 (range 4-10)	9.0 (range 9)
Student C	2.3 (range 2-3)	8.0 (range 6-10)	10.0 (range 9-11)



<Figure IV-6> Expressive Writing Score

## V. Discussion

This study investigated the effects of SRSD writing instruction on the English writing ability of college students with hearing impairment who has learning difficulties. The results of this study were uniformly positive and indicate that each of the three participants improved their ability to

summarize information following instruction in the TWA&PLANS strategy. This study demonstrated improvement in both the quantity of English writing participants were able to generate, and the quality of their writing. In summary, SRSD writing instruction has been highly effective in improving the writing skills of students with hearing impairment and their college grades. The following is a summary of the results, and discussion of the study.

### 1. Effects on Writing Quantity

The result of the first research question showed that SRSD writing instruction was effective in improving the English writing quantity of college students with disabilities during the intervention and maintenance phases. At their baseline standard, the students' written texts were generally short and incomplete. But after SRSD writing instruction, the students showed an increase in English writing length. This increased number of words showed the effectiveness of the intervention and maintenance phases. The students showed stability in writing length during the intervention phase, because they were able to write longer summaries, given the familiar academic topics which were closely related to their majors and background knowledge. Although all the students displayed improvement in writing quantity during intervention, Student B and Student C showed more progress than Student A. Only Student A wrote summaries of the information in texts they were assigned to read during the baseline phase. The participants did not have confidence to write in English and felt intimidated. However, the current study offers evidence that one-on-one teacher-directed, explicit, self-regulated strategy instruction, guided practice, and independent practice for writing foster growth in reading comprehension and writing in students who struggle with English expository text reading and writing. As a result of these strategies, the students gained the confidence to write in English at greater length and to completion. This demonstrated the importance of the instructors' role in SRSD writing instruction, which chimed with the results of previous research (Graham, Sandmel, 2011; Thompson, 2011). In addition, since all three students in this study had memorized and learned to apply the

strategy steps during instruction, the stability and level of performance may have been improved by providing opportunities for them to practice TWA&PLANS for reading and writing after establishing performance criteria.

The results were consistent with previous research (Mason et al., 2006; Mason, Harris, & Graham, 2011). However, the previous empirical research did not examine EMI for college students with hearing impairment but students with learning disabilities (Park et al., 2008; Mason et al., 2008). This study occurred in a college setting and used texts conducive to integrating students' writing and subject matter related with their majors in college. Therefore, students could assimilate the strategy into the lectures delivered in English in their major courses, and instructors could incorporate SRSD English writing instruction into their lectures or workshops and seminars.

## 2. Effects on Writing Quality

The result of the second research question showed that SRSD writing instruction was effective in improving the English writing quality of college students with disabilities during the intervention and maintenance phases. At their baseline standard, the students' writing scores were very low, and their work was incomplete. But after SRSD writing instruction, the students showed an increase in English writing quality. The increased writing quality scores showed the effectiveness of the intervention and maintenance phases. These results support previous research (Mason, Harris, & Graham, 2011). The students' planning process, selection of contents, textual organization and level of expressive writing were enhanced after the intervention. Training in writing self-descriptions helped college students with disabilities who struggle with English reading and writing to self-regulate their strategy acquisition. For all three participants, PND was calculated. The percentage increases in writing quality scores were significant and remained stable throughout the intervention.

This study focused on the expository and informative English writing of college students with disabilities. Previous SRSD writing instruction research focused on elementary school and middle school students with

learning disabilities. Therefore, the focus on research related to college students with disabilities is of great significance. In SRSD instruction it is important that students are not provided a more advanced stage of strategy instruction until they have mastered the required skills. Writing mechanics such as grammar, spelling, and handwriting should not be explicitly taught or corrected during prewriting, planning and composing, and are best reserved for revision sessions. Instructors should avoid overemphasizing student errors. The students had grammatical knowledge and could correct errors in their summaries themselves. Therefore their grammar and vocabulary problems were ameliorated during the intervention phase, although they did not receive any instruction in them. In addition, it is well established that students with writing difficulties have difficulty in maintaining skills they have been instructed in. Therefore, the instructor should provide opportunities for ongoing review and practice. Maintenance is best supported when strategies are pursued across the curriculum and courses, requiring instructors to collaborate with each other.

### 3. Limitations

Several limitations of this study have been identified. One limitation is the incomplete student records available for the participants in the study. None of the students had achievement score records in their student files, and their learning disability areas had not been diagnosed. The students had records that were limited in both content and detailed identification of student strengths and weaknesses, thus reducing the ability to provide complete student descriptions. However, all participants satisfied university documentation requirements for receiving disability support services, and exhibited academic characteristics consistent with students with learning difficulties. A second limitation was the sample of participants. Those included in the current study were female college students with hearing impairments. Initially there were four student participants, including a male college student with visual impairment. However, the sole male student dropped out after the intervention phase cause of individual schedule. He attended the four baseline tests, three training sessions, and intervention

sessions four times. Unfortunately, as he did not attend to the conclusion of the study, the researcher could not compare and analyze the effects of his disability, nor his gender and grades with those of the other participants. A third limitation consisted of the changes made to the probe session scheduling during the maintenance phase of the study. Due to the approaching end of the semester, students on the second and third tiers of the research design replications had to change from maintenance probes occurring at two-week intervals to maintenance probes occurring at one-week intervals. A one-week interval between maintenance sessions may not have been ideal in determining if students were able to maintain writing length and quality over time. Also, it would have been desirable to allow maintenance probe sessions to continue for several more weeks for students on the lower tiers of the research design replications.

#### 4. Implications for Further Research

This study provided evidence that instruction in the TWA&PLANS strategy (Mason et al., 2006) is an effective procedure for improving the ability of college students with hearing impairment to write English related to important textbook-based information in testing situations. This finding has implications for college students with disabilities and post-secondary personnel who provide services to them. While an increasing number of students with disabilities are enrolling in college (Brinckerhoff et al., 2002; Ministry of Education, 2013), they are not experiencing the same level of academic success as their peers without disabilities (Murray et al., 2000; Cho & Son, 2013)). The empirical validation of effective interventions for college students with disabilities is one step in the process of providing college students with disabilities the ability to independently meet the academic demands of the college environment. Specifically, the TWA&PLANS strategy can provide students with a tool to enhance their ability to summarize important information from college textbooks, a skill that the participants in this study identified as one that is important for all college students. Ultimately, the adoption of strategies for meeting the academic demands of college could lead to improved rates of success for

college students with disabilities. Many of the support services and facilities that college students with disabilities receive create an environment in which the student is dependent on others for support (e.g., tutoring, note-taking services, course outlines, etc.). The learning strategies examined in this study are independent tools that can decrease students' reliance on external assistance. These strategies assist students in accepting the responsibility of knowing how, when, and in what situations to use the learning techniques they have been taught, including the ability to generalize the application of strategic learning skills to new situations. While there is an initial investment of time and effort in both teaching and learning a strategy, the positive effects can be long lasting. When used in conjunction with other services and facilities, strategy instruction could prove to be a factor in helping college students with disabilities to achieve higher attendance and graduation rates.

The findings of this study indicate that strategies such as the TWA& PLANS strategy can be taught to college students with hearing impairment who has learning difficulties in disability support service settings including small group instruction and one-on-one instructional formats. This offers personnel who provide services to college students with disabilities another resource for providing these students with empirically validated supports during their academic careers. In addition, the findings of this study may be applicable to the period prior to post-secondary education. According to previous research, SRSD writing instruction is a very effective intervention along the spectrum from elementary to secondary school students. Therefore, it should also be implemented with the cooperation of students and teaching professionals at both the secondary and post-secondary levels. Furthermore, the findings of this study may generate interest among post-secondary faculty and disability support personnel in further research into strategies and other instructional interventions, in an effort to identify effective models of support for students with disabilities. Also, the findings may assist in the creation of avenues for collaboration between disability support offices and other academic skills staff on college campuses or colleges of education, who may have expertise and personnel who could assist disability support offices with strategy instruction.

Future research needs to address the generalized use of the

TWA&PLANS strategy by college students with hearing impairment who has learning difficulties. A follow-up study of the participants could yield important data about their ability to maintain and apply the strategy to novel settings and situations over time. This will be critical when designing systems to implement this type of strategy use in college disability support service environments because of the importance placed on independent learning in college settings. Finally, future research should be conducted to identify other strategies and instructional approaches that can assist students with disabilities to independently meet the academic demands of the college.

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## 자기조절 쓰기 전략교수가 장애대학생의 영어쓰기능력에 미치는 효과

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### < 요약 >

본 연구는 읽기 활동을 통합한 자기조절 쓰기 전략교수가 장애대학생의 영어 쓰기 능력에 미치는 영향에 대해 검증하고자 한다. 연구의 대상은 서울 소재 4년제 대학교에 특별전형으로 입학한 장애대학생들 중 쓰기에 어려움을 보이는 청각장애학생 3명이 참여하였다. 본 연구는 대상자 간 중다간헐 기초선 설계를 사용하여 실험을 진행하였고, 전략교수는 일대일로 진행되었다. 본 연구의 TWA & PLANS 쓰기 전략 교수는 읽기 전략과 쓰기 전략을 활용한 쓰기 과정 전략 교수를 의미하며, 기초선 3회~8회, 전략 교수 3회, 중재 10회, 유지 4회로 주 2회씩 최소 18회기, 최대 22회기 동안 진행되었다. 본 연구의 결과는 쓰기 전략 교수 유형에 따라 양적인 부분과 질적인 부분으로 나누어 학생들의 쓰기점수 변화를 측정하였다.

본 연구에서 얻어진 연구결과는 다음과 같다. 첫째, 자기조절 쓰기 전략교수를 활용한 중재를 통하여 세 명의 청각장애대학생의 글의 양이 증가하였다. 둘째, 자기조절 쓰기 전략교수를 활용한 중재를 통하여 세 명의 장애대학생의 글의 질은 모두 매우 높은 수준으로 향상되었고, 높은 수준으로 유지되었다. 요약한 글의 질에 대하여 쓰기과정 계획하기, 내용, 구조 및 문법에 대한 항목으로 세분화 하여 분석한 결과, 각 요소별로도 쓰기 능력이 크게 향상된 것으로 나타났다. 이를 통해 교사의 명시적 설명과 구체적인 시범과 안내 및 일대일로 진행되는 개별화 수업은 학생들의 영어 글쓰기 능력에 매우 큰 도움을 준다는 결과를 제시하였다. 본 연구 결과를 바탕으로 쓰기 학습 장애 대학생들을 위한 쓰기 전략의 효과에 대해 논의하였으며 향후 연구에서 고려할 점을 제언하였다.

**주제어** : 자기조절전략교수, 쓰기, 장애대학생, 청각장애

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