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Effects of Note-Taking Training on Reading Comprehension and Recall

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ABSTRACT

The present study examined the process and product effects of note-taking strategy training on Iranian EFL learners' comprehension and retention of written material, with gender as a moderating variable. Intermediate undergraduate EFL learners (N = 108) were assigned to experimental and control groups. The Experimental (intervention) Group received training on how to take notes, using graphic organizers as a guide, while the Control Group did not receive any instruction. A multiple-choice reading test as well as two immediate and delayed written recalls (in combination with reviewing the notes) was used to measure note-taking effectiveness. The results of two-way ANOVAs suggested that the Experimental Group performed significantly better on both comprehension and recall tests. No statistically significant effect of gender was found on students' performance in the comprehension and retention tests. Analysis of written recalls also showed that the Experimental Group remembered more important ideas, and better identified the relationships between ideas.

INTRODUCTION

Week after week, teachers assign academic texts for students to read and learn; in fact, for most courses this is the principal mode of teaching (Clerehan, 1995). Further, a predominant pattern in these courses is for classroom instruction to be characterized by teachers lecturing and students taking notes. To assist understanding, most learners take notes of the important information they are reading, but do they employ effective note-taking skills to succeed in their reading tasks?

It is generally understood that reading comprehension is an interactive mental process between a reader's linguistic knowledge, knowledge of the world, and knowledge about a given topic. While reading, the reader constructs various representations of the text that are important for comprehension. Field (2002) argues that those representations include the surface code (the exact words of the text), the text code (main ideas representing the meaning of the text), and the mental models (the way in which information is represented in mind) that are embedded in the text. According to Nunan (2003), reading comprehension is a fluent process of combining information from the text and the existing schemata to understand the meaning. Therefore, reading for comprehension or meaning is one primary purpose for reading. But there are some obstacles to successful understanding. As Gersten, Williams, Fuchs, and Baker (2001) state, "Many of them arise in the strategic processing of text. For

example, students may not possess appropriate strategies for problem situations or they may not know when to use a strategy they, in fact, do possess" (p. 280).

One of these strategies, note-taking, is believed to improve learning of both oral and written materials. It is a useful technique in studying content, developing language skills, and learning tasks in general (White, 1996). O'Malley and Chamot (1995) define note-taking as "writing down the key words and concepts in abbreviated verbal, graphic or numerical form to assist performance of a language task" (p. 138). Fajardo (1996) sees note-taking as a complex activity which combines reading and listening with selecting, summarizing, and writing. Nwokoreze (1990) believes that "it is during the note-taking stage that students reach the highest level of comprehension" (p. 42).

The beneficial effect of note-taking is discussed in terms of two major functions (Kiewra, 1987). The first belief is based on the idea that the process of recording notes facilitates learning (which is known as the *encoding hypothesis*). It might include increasing students' attention, raising awareness of text organization, storing the information into memory, and encouraging the learner to compare the material with previously learned information. This hypothesis emphasizes the process functions of note-taking. The second hypothesis, external *storage hypothesis*, is related to the review function of note-taking. It is equally important because the notes (i.e., the products) serve as an external storage of information that can be used in retrieving the content in delayed recalls or answering exam questions. In this approach, the product functions of note-taking are emphasized.

Both note-taking functions assist students in paying more attention to important points and less attention to trivial details. For students to take full advantage of both functions, they must both take notes as well as review them (Robinson, Katayama, Odom, Beth, Hsieh, & Vanderveen, 2006). However, the problem is that students are generally poor note-takers, recording less than half of the critical ideas. If they take and study those notes, they miss out the second function (product effect) because they are reviewing incomplete notes (Katayama & Robinson, 2000). Kiewra, Benton, Kim, Risch, and Christensen (1995) make a distinction between conventional notes and notes taken with the help of specific frameworks such as graphic organizers or outlines. Conventional notes are the notes which are taken as a result of students' usual note-taking habits. Outline and graphic notes, on the other hand, are taken with the help of organizational devices which, by showing the organization of ideas and their relationships, guide students in taking more effective notes.

Graphic organizers are preferred to other organizational formats for several reasons. First, in graphic organizers, concepts are presented in a visual format, that is, the relative location of concepts and the relations among them are represented in a graphic format. In fact, they show, rather than describe, the organization of concepts (Robinson & Schraw, 1994). Another benefit of graphic organizers is discussed in terms of the encoding processing. When the information is presented both in the text and graphic organizers, it is encoded in two verbal and visual formats. The relative involvement of these two modes leads to the easier retrieval of concepts from long-term memory (Robinson & Molina, 2002).

Green and Oxford (1995) emphasize the importance of finding the relationship, if any, between the use of strategies and learner variables such as gender, language proficiency, or motivation. Therefore, this study also tried to investigate, as a moderator variable, whether males and females differed in the way they utilized the note-taking strategy. Given increased research interest on note-taking process and product functions, examining it properly in EFL contexts deserves a good deal of attention.

LITERATURE REVIEW

Previous studies on the effect of note-taking have mainly focused on the process and product functions of note-taking. Slotte and Lonka (1999) studied the process and product effects of spontaneous note-taking on text comprehension. High school graduates (N = 226) were asked to apply their usual note-taking procedures while reading a philosophical text. Half of the participants were told in advance that they could review their notes during writing tasks designed to measure the ability to define, compare, and evaluate text content. The other group completed the tasks without their notes. The results showed that both the process and review effects impacted test performance measured through writing tasks. Equally, those students who knew they could review their notes later wrote more extensive notes, verifying the product or review effect. However, there were two limitations in this study: students were not allowed to write in or underline the text (instead, they wrote the notes in a separate sheet), and the text did not include headings.

In another study, Lonka, Lindblom-Ylanne, and Maury (1994) evaluated how the note-taking strategies of 200 university applicants (underlining and concept maps) affected detailed learning, synthesis tasking, and critical reviewing of a text. The subjects were allowed to make notes either in-text or on a separate piece of paper. The results showed that the hierarchical position of concepts directed students' attention and retention of content. Underlining improved both detailed learning and synthesis tasking, while concept mapping affected the critical analysis of the content; however, the omission of a delayed testing may be one limitation of their study. In a similar study, Dunkel (1988) showed that the number of information units, rather than the quantity of notes taken down, contributed to the post-lecture test performance. He notes the importance of providing learners with organizational devices that guide them in taking quality notes.

Some studies have investigated the role of graphic organizers in taking notes. Encoding benefits of graphic organizers and outline note-taking using spaced study and review were investigated (Katayama & Robinson, 2000). In two 40-min periods separated by two days, 117 undergraduates, divided into six groups, studied a chapter-length text along with a set of complete, partial or skeletal graphic organizers or outlines. The complete graphic organizers (showing the hierarchical relations between ideas in a visual format) or outlines included all the concept relations in the text, and students did not need to take notes; some of information was deleted in partial formats, and skeletal formats contained just headings. Students in the partial and skeletal groups were required to fill in the missing information by searching the text. Before testing, all groups were given their notes to review, and they were collected after 10 minutes. The results showed that both partial and complete graphic organizer groups outperformed the partial and complete outline groups. Similarly, all partial-notes groups outperformed complete outline groups on factual and application tests administered two days later. The superiority of partial notes can be explained through the encoding hypothesis: Students learn more concepts because they are more involved in a generative text processing. This encoding effect may be interpreted by the process in which the students are actively involved in generating concepts that need to be studied and remembered later more meaningfully than when the notes are provided for them. However, this study did not include any training in using spatial displays, and did not assess the students' previous familiarity with graphic organizers.

A similar study by Robinson et al. (2006) examined the effect of teaching graphic note-taking on text comprehension using three quasi-experimental and one true experimental design. One hundred and twenty undergraduates of an educational psychology course participated in the study. Partial and complete graphic organizers were provided for twelve chapters of a course book. In addition, students' note-taking style (linear vs. graphic) was

measured at the beginning and end of the course. Gradually, more information was deleted from graphic organizers for the last chapters. The intervention involved instructing students how to take graphic notes in a computer environment. Partial graphic organizers were presented on the computer screen. When students clicked on the empty cells, a window appeared with several choices. Then, they selected an item by clicking on it and went to the next empty cell. In all experiments, students who completed partial graphic organizers scored higher than those who viewed complete graphic organizers or wrote summaries on examinations and quizzes that measured course content. Moreover, a change from linear to graphic note-taking was observed among those who were trained (a computer-based training) to complete partial notes. The researchers surmised that graphic organizers are effective in any course that demands relationships understanding among concepts.

Respecting an Iranian context, no study to date has investigated whether training students on note-taking with graphic organizers in a classroom environment could assist them to understand and remember important ideas. The present study was designed to achieve this aim while providing valuable insights for language learners,

RATIONALE

The purpose of the present study was to investigate the product and process effects of note-taking instruction with graphic organizers on comprehension and retention in an Iranian EFL context. A related goal was to examine the effects of note-taking by gender on EFL learners' reading comprehension. More specifically, it tried to first see how graphic organizers (as a note-taking guide) can aid students to understand and remember the relationship between concepts, and then examine the effectiveness of graphic notes in comparison to conventional notes. In addition to training with graphic organizers, students received verbal instruction on note-taking. In order to achieve the aims of the study, answers to the following questions were sought:

1. What is the effect of graphic note-taking instruction (using graphic organizers) on students' reading comprehension?
2. What is the effect of graphic note-taking training on students' retention of materials?
3. Is there any significant relationship between gender and the effectiveness of graphic note-taking on students' reading comprehension?
4. Is there any significant relationship between gender and the effectiveness of graphic note-taking on students' recall?

Correspondingly, the following null hypotheses were formulated:

1. There is no significant difference between training students on graphic note-taking and the comprehension of the written materials.
2. There is no significant effect of graphic note-taking instruction on students' recall of information.
3. There is no significant relationship between students' gender and the effect of graphic note-taking instruction on comprehension.
4. There is no significant relationship between students' gender and the effect of graphic note-taking instruction on retention.

METHOD

Participants

The sample consisted of 108 undergraduate students majoring in English-language translation. Their proficiency level was assessed through their performance on a test measuring reading comprehension. Those students whose scores fell within a standard deviation of 1 point below or above the mean were chosen for this study. The purpose was the homogeneity of two groups in terms of reading ability. For practical limitations, it was not possible to assign subjects randomly to two experimental and control groups. Therefore, the researcher used two intact classes with 60 and 56 students (initial sample consisted of 116 students). A semi-random procedure was used to determine which group will be the Control and which will be the Experimental. The Experimental Group consisted of 48 students (18 males and 30 females) and the Control Group consisted of 60 students (22 males and 38 females).

Materials

Two reading tests were used in this study. The reading comprehension section of a standard language test, namely, the *Michigan Test of English Language Proficiency*, was used to measure participants' reading proficiency level. The test included four passages, each followed by five multiple-choice questions. Another test, which was the reading section of a TOEFL test, served as the posttest, and it consisted of five passages with thirty multiple-choice items. The reliability of the tests was calculated using the KR-21 formula, and was within an acceptable range (the pretest was 0.70, and the posttest 0.75). Structured note-taking format was used to teach students about the organization of the text (Billmeyer & Barton, 2002). It included partial graphic organizers to raise students' awareness about text structure by identifying the main ideas and supporting details and their organization. A sample partial graphic organizer is provided in the Appendix. The reading passages for strategy training were selected from the students' textbook (Markstein & Hirasawa, 2004). The criterion for selecting the reading passages was students' unfamiliarity with the subject matter. This was achieved by asking participants some questions about the texts prior to assigning them.

Procedures

All the data was collected during a period of two months. In order to control for the lack of randomization, a reading pretest was administered to determine the proficiency level of subjects in terms of reading ability. Out of the initial sample of 116 students, 108—whose scores were in the acceptable range—were chosen for this study. They formed two reading classes that held two sessions every week. Both classes studied the same book, but with different instructors, and the syllabus and teaching methods were roughly the same for both groups.

The experiment was conducted over eight 30-min sessions. In the first session, the researcher introduced the importance of note-taking and described the objectives of structured note-taking, and text was provided for each student. The instructor read the passage aloud as students followed along silently. They were required to survey or preview the text (by looking for subheadings, pictures, key words, or captions), and then highlight information they regarded as significant through underlining, use of symbols, or use of different colors. Then, the instructor put the partial graphic organizer chart up on the board

for students. It contained some of the information and concepts, and students had to complete the remaining empty blocks with the assistance of their teacher. Gradually, as students progressed more in identifying important ideas and their relationships, more information was deleted from graphic organizers so that in the sixth session they completed blank graphic organizers without the help of their teacher. In addition to the graphic organizer training, the teacher also gave verbal instructions to the students about some techniques and guidelines that could improve their note-taking efficiency (e.g., identifying a purpose for note-taking, concentrating on the significant information, putting the information in one's own words, underlining those points they thought may appear later in tests, use of abbreviations and symbols to aid recall).

After the treatment was over, in order to evaluate the effect of note-taking training on reading comprehension, students were required to read passages and take notes, after which they had 30 minutes to answer 30 multiple-choice questions. They could review their notes in answering the questions. Next, all the subjects were required to write an immediate recall of the passages. They were asked to write whatever they remembered from the reading passages they had just read. In contrast, the Control Group subjects employed their usual note-taking habits, writing notes on a blank sheet of paper, while the Experimental Group employed graphic organizers. At the end of the session, the students submitted their graphic organizers or conventional notes to the teacher to be used in delayed testing. To measure recall, the same posttest (with the passages removed from the test) was given to the students a month later. But before testing, the teacher returned to each student their notes to review for 10 minutes. Then, they answered the written multiple-choice questions in 30 min. This time, due to the time and administration limitations, it was not possible to collect a written recall protocol from the students; instead, they reported orally what they remembered from the first administration of the reading passages. The researcher took notes from what they recalled with the help of the classroom teacher who sound-recorded the notes. The procedure was done individually with 50 students, so that fifty sets of notes or delayed recall protocols were available for qualitative analysis.

RESULTS AND DISCUSSION

The results of the pretest showed that the means of Experimental (M = 15.02) and Control Groups (M = 14.9), as well as those of males (M = 14.88) and females (M = 15), did not differ statistically. Table 1 shows the descriptive statistics for the pretest. Considering the fact that the two groups were equal at the beginning of the study, data from the posttest was used to compare and evaluate the effect of treatment. Since the two dependent variables of reading comprehension and retention were not related to each other (i.e., they measured distinct constructs), separate two-way ANOVAs were conducted for each dependent variable. The two independent variables in this study were note-taking instruction and students' gender.

Table 1. Note-taking Instruction and Gender

Gender	Intervention	Mean	Std. Deviation	N
Male	Note-taking	14.89	1.64	18
	Control	14.86	1.32	22
	Total	14.88	1.45	40
Female	Note-taking	15.10	1.84	30
	Control	14.92	2.24	38
	Total	15.00	2.06	68

Reading Comprehension

To examine the effect of note-taking instruction and gender on reading comprehension, descriptive statistics were calculated for this factor. Table 2 lists the means and standard deviations, as well as the overall values, for each group.

Table 2. Effect of Note-taking Instruction and Gender on Reading Comprehension

Gender	Note	Mean	Std. Deviation	N
Male	Note	21.78	3.71	18
	Control	19.82	2.68	22
	Total	20.7	3.29	40
Female	Note	22.00	3.34	30
	Control	19.05	3.54	38
	Total	20.35	3.73	68

Dependent variable: Reading comprehension

A comparison of the means across groups shows that the Experimental Group (M = 21.92) performed generally better than the Control Group (M = 19.33). Regarding the effect of gender, however, there is little difference between males (M = 21.78) and females (M = 22.00) in the Experimental Group. In order to compute statistical significance, the data were submitted to a two-way ANOVA with note-taking instruction and gender as between-group variables. Table 3 shows the results of the two-way ANOVA.

We are interested in lines 3-5 in Table 3. In line four, since the $F(1,104) = 13.27$ for instructed note-taking exceeds the critical value (3.94), there is a significant effect of note-taking strategy instruction on reading comprehension. Therefore, we can reject the null hypothesis and surmise that, since the effect size is large enough (eta squared =.11), note-taking instruction truly affects subjects' comprehension. However, there is no significant effect of gender $F(1,104) = .16$, providing empirical support for the null hypothesis predicting that there is no relationship between gender and note-taking instruction. This means that males and females made similar gains in reading comprehension through note-taking instruction.

Table 3. The Two-Way ANOVA Effect of Note-taking Instruction and Gender on Reading Comprehension

Source	Type lll Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	86.684a	3	62.228	5.511	.001	.137
Intercept	42517.258	1	42517.258	3765.542	.000	.973
Gender	1.837	1	1.837	.163	.687	.002
Note	149.872	1	149.872	13.273	.000	.113
Gender * Note	6.073	104	6.073	.538	.465	.005
Error	1174.279	108	11.291			
Total	46666.000	107				
Corrected Total	1360.963					

Dependent variable: Reading comprehension, $p < .05$, a: Adjusted R squared = .137 (Adjusted R squared = .112)
*: the interaction effect

Further, line five shows that the interaction effect of two independent variables is small: $F(1,104) = .53$. Therefore, we might claim that the difference between the two groups is mainly due to the effect of strategy instruction—the females performed better than the males, although the difference is not statistically significant.

Note-Taking and Recall

Regarding the second independent variable, the total mean of Experimental Group ($M = 21.85$) was higher than that of the Control Group ($M = 20.12$). Moreover, the mean of males in the Experimental Group exceeded that of the females. To see whether these differences reach the statistical significance, a two-way ANOVA was conducted.

The relatively high value of $F(1,104) = 14.40$ shows that there is, indeed, a significant effect of note-taking strategy on subjects' recall. Considering the effect size (eta squared =.11), we can claim that this effect is also meaningful. Thus, the second hypothesis is also rejected. When the reference is made to the same results for dependent variable of reading comprehension, we see that the positive influence of note-taking instruction is more connected with retention than comprehension. Therefore, the hypothesis that there is no relationship between subjects' gender and the efficiency of note-taking for recall is supported, as there is no considerable effect of gender on recall.

Table 4. Effect of Note-taking Strategy and Recall

Gender	Note	Mean	Std. Deviation	N
Male	Note	22.17	1.58	18
	Control	20.45	1.87	22
	Total	21.22	1.92	40
Female	Note	21.67	2.53	30
	Control	19.92	2.51	38
	Total	20.69	2.65	68

Dependent variable: Retention

Table 5. The Two-Way ANOVA Effect of Note-taking Strategy and Recall

Source	Type lll Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	87.22a	3	29.094	5.631	.001	.140
Intercept	44137.797	1	44137.797	8541.988	.000	.988
Gender	6.648	1	6.648	1.287	.259	.012
Note	74.418	1	74.418	14.402	.000	.122
Gender * Note	.007	1	.007	.001	.971	.000
Error	537.384	104	5.167			
Total	47750.000	108				
Corrected Total	624.667	107				

Dependent variable: retention, $p < .05$, a: Adjusted R squared = .140 (Adjusted R squared = .115)
*: the interaction effect

However, if we contrast this F-ratio (1.28) with the corresponding value obtained for reading comprehension F (.16), it is clear that the effect of the gender factor is more significant for recall than for comprehension. The very small F-ratio for the interaction of

two variables suggests that the gains in recall are the results of the main effect of instruction rather than gender. This time, however, males outperformed the females in both groups. Tables 4 and 5 show the results of the ANOVA operation as well as descriptive statistics.

If we compare the results of two analyses with each other, we see that although females outperformed the males in reading comprehension, males gained higher scores than females in retention. In other words, we can assume that while note-taking instruction worked better for females in comprehension, it improved recall for males. Taken together, these findings provide a strong support for the claim that note-taking strategy instruction improves both the reading comprehension and retention of intermediate EFL students.

Analysis of Notes

Dunkel (1988) recommends that "investigators and note-taking teachers need to be cognizant of the kind of information recorded in notes, not just the amount of information recorded" (p. 273). In addition to statistical analyses, a content analysis of the recall protocols of the two groups was provided by two university lecturers, conferring to reach agreement in their analysis, the purpose of which was a qualitative analysis of recall protocols in order to test the statistical results, without any quantification or scoring the content. Several criteria were used in judging the quality of written recall protocols or the notes of two groups: the hierarchical organization of content (including the main ideas, subordinate details, and their relations), degree of verbatim note-taking, paraphrasing, use of symbols, abbreviations, and total number of words (Clerehan, 1995; Badger, White, Sutherland, & Haggis, 2001). Incorrect spelling and syntax were not taken into account.

The first obvious difference between the protocols of the two groups was the number of words: the Experimental Group had written significantly more words than the Control Group. In addition, the Experimental Group wrote down more key ideas, and their notes were more complete than the Control Group, who had written often incomplete short notes. In both groups, the amount of detail was less than the local points (i.e., their notes included more important and general ideas than specific details). However, the Experimental Group mentioned more main concepts than the Control Group. Table 6 shows the distribution of main ideas, supporting details, and omissions of information in the Experimental and Control Groups' notes.

Table 6. Proportion of Main Ideas, Supporting Ideas, and Omissions

Groups	Experimental	Control
Main Ideas	45%	32%
Supporting Details	25%	23%
Omissions	30%	45%
Total	100%	100%

Discrepancy between main ideas and supporting details was more frequent among the control group's ideas. Both groups' protocols included grammatical and spelling mistakes, as well as notes written in L1, which shows a lack of English language proficiency among the foreign students. In general, the amount of verbatim note-taking (the mere copying of textual information) was more than paraphrasing in the protocols of both groups. It is necessary to mention that males and females were roughly similar in both the kinds of note-taking strategies they used, as well as the amount of information in their notes.

CONCLUSION

The purpose of the present study was to investigate the product and process effects of note-taking instruction with graphic organizers on the comprehension and retention of written material and to examine whether students' gender moderates the results or not. The results of data analysis revealed that students who completed and studied graphic organizers performed considerably better on both comprehension and recall conditions than did students who studied their conventional notes. That is, both the product and process effects of note-taking instruction were confirmed. The findings also provide evidence for a slightly greater effect of reviewing notes on the retention of material, of course, not statistically significant. This may support the important role of graphic organizers in the retention of information. In addition, the results confirm the previous findings that graphic organizers improve learning from texts (Robinson & Kiewra, 1995; Robinson & Molina, 2002), whereas conventional notes result in a poorer test performance (Kiewra et al., 1995). It can also be concluded that note-taking training, particularly in the use of partial graphic organizers, is effective for successful learning (Katayama & Robinson, 2000).

Regarding the second independent variable, students' gender, results of a two-way ANOVA and analysis of notes suggested that students' gender had no significant effect on note-taking. In fact, there was no difference found between males and females in terms of note-taking efficiency. However, it was found that while females outperformed the males on comprehension, males were better in terms of retention.

Qualitative Analysis and Pedagogical Implications

In order to offer a qualitative interpretation for the above results, two immediate and delayed recalls were gathered from the students. As mentioned in the method section, in both recall conditions, Experimental Group papers contained more idea units, included more words, and represented the relationships among the facts better. Equally, they supported the finding that the number of words in the notes correlated with test performance (Clerehan, 1995). The analysis showed that the Experimental Group was more successful in distinguishing the different layers of the text and the interrelationship between ideas. This may further support the results of the quantitative analysis regarding the effectiveness of graphic organizers in highlighting important ideas. Thus, it can be suggested that both the quality and quantity of note-taking affects learning.

In general, the amount of subordinate ideas was less than the main ideas in students' notes. This is consistent with Clerehan's (1995) findings that the number of ideas decreases as L2 students move from the level-one idea (main points) to level-two or three (supporting details). However, in delayed recall students remembered fewer details than they did immediately after treatment, but this may also be the result of the verbal-only testing. Analysis of recall papers revealed that a great many students from both groups failed to employ note-taking strategies effectively. Many students simply wrote down words, or wrote phrases word for word, without connection or comprehension.

The results of this study have several pedagogical implications for the way in which note-taking strategies are conceptualized. Students should be taught that diverse note-taking strategies do exist. In turn, each strategy demands different mental tasks and is affected by multiple factors. Students need to acquire the metacognitive knowledge that allows them to know when, and under what conditions, a particular type of note-taking strategy is most effective. By incorporating spatial note-taking formats such as graphic organizers, teachers can guide their students in taking high-quality notes. Students should also realize that not all the information is of equal significance—recalling the essential facts should be the focus of

learning rather than grasping individual details. Teachers should equally pay attention to the effectiveness of strategies students employ, not just the overt study behavior.

Limitations and Suggestions for Further Research

Dunkel (1988) points out that students' attitudinal factors such as interest, motivation, and previous knowledge about content influence note-taking. Since note-taking is generally not a requirement for success in courses, students may not be motivated to engage in such behavior. This study specifically examined the effect of one type of note-taking strategy. Further research investigating other potential strategies, or a combination of several strategies together, might yield a different picture of the note-taking process. Examining the effect of a course-length note-taking training in relation to the students' performance on final exams would seem helpful to students. Similarly, recent research shows that students' learning orientations affect the way study strategies are utilized (Ferla, Valcke, & Schuyten, 2008). It would be desirable to understand how students' cognitive styles (auditory vs. visual or analytic vs. holistic) may interact with their note-taking activity. Finally, it would be helpful to measure the effects of note-taking instruction for long-term retention, after a week and after more than a month.

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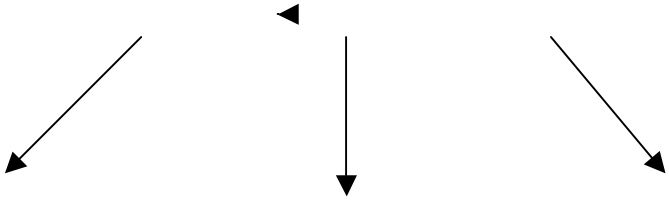
APPENDIX

Partial Graphic Organizer

Write topic here

First English Settlers in the New World



What problems did they face?	What changes caused these problems?	What did they do to solve the problem?
a. dissent	a. …….	a. …….
b. …….	b. communal farming	b. partnership development
c. illness	c. …….	c. …….
d. …….....	d. group work	d. individual farming
e. starvation		