The effect of computer assisted word processing instruction on frequency and quality of revision in eighth graders' expository writing

by

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CHAPTER I. INTRODUCTION

To enable students to perceive writing as a way of thinking, teachers have practiced and researched the process approach to teaching writing. Since 1968, several models of the writing process have evolved to identify the subprocesses of writing and describe the interaction among those subprocesses. These models may be classified as either linear stage models or recursive process models. The linear stage models include the following series of stages: prewriting (planning), composing (writing), and revising (editing). Using this step-by-step sequence, inexperienced student writers often start with the first sentence and continue linearly until they finish. Most write only two drafts, rarely modifying their texts. Revisions are limited primarily to corrections in spelling and punctuation and changes in wording or phrasing (Kane, 1983). Skilled student writers, on the other hand, spend more time with prewriting, but also feel a need to restructure and reshape their writing (Sommers, 1980). Revision in the context of the linear stage model consists of editing surface features of the text to correct errors (Rohman & Wlecke, 1964).

The process approach to writing, currently used in many classrooms, reflects a recursive shifting of emphasis from product to process in writing instruction. In the process model, the writer weaves his/her way through many subprocesses (planning, remembering, generating, monitoring, reviewing, evaluating and revising (Graves, 1975; Nold, 1981). Revision in the recursive mode requires that a writer notice and resolve discrepancies between what has

been written and the intended text. To do this, he/she reviews, evaluates, and changes content and ideas. The writer passes through the process once or many times, emphasizing different stages during each passage (Murray, 1985).

Using the recursive process model, writers return to substrands of the overall process. There is a forward-moving action that exists by virtue of a backward-moving action. For example, the most visible recurring feature or backward movement involves rereading every few phrases. Some writers may go back after every sentence, but more frequently, the recursive movement occurs after a "chunk" of information has been written (Perl, 1983). The unit of discourse that is reread is not only a syntactic one, but also a semantic one defined by the writer. Often the process writing teacher will comment on content and organization (semantics) in early drafts in an effort to help the student discover meaning and become more fluent in written expression. Surface feature (syntax) edits are reserved for almost-completed drafts.

A second recurring feature relates to a key word or item associated with the topic. In subsequent recursive movements, the writer resolves mismatches between requirements of the audience and requirements of the writer, the topic, and the purpose. He/She often returns to reread the assigned topic, changing it to suit new perceptions.

There is sometimes a third backward movement that is more difficult to measure. It is a "felt sense" or non-verbalized perception of feelings evoked in the writer to what is not yet in words, but out of which images, words, and

concepts emerge (Gendlin, 1978). The writer chunks information for retrieval and then focuses attention on what he/she knows to determine the kind of writing that will best carry the message to the audience. It is this third backward movement that sometimes frustrates beginning writers who have trouble determining the audience's knowledge, values, and prejudices about the subject and selecting a point of view toward the audience. This is the point at which writers must be taught to plan, to decide about their intentions, and to revise using explicit teacher suggestions (Sudol, 1985). The recursive process model gives teachers and students a common view of writing and a logical procedure that can be adapted to individual student needs.

Computers and the Writing Process

Across the country, many teachers are beginning to incorporate word processing into their writing classes. They have found that computers facilitate recursive revision as just defined because word processors free writers to pause and reread major chunks of ideas by scrolling back and forth to see what they have written. The students' sense of task, their success in learning word processing programs, and their individual writing abilities all impact their success in writing using computers. However, teaching revision as a part of the recursive writing process can free students to use the computer as a writing instrument that enables them to advance intellectually much as professional writers might progress toward actual publication (Papert, 1980).

Even though computer-assisted word processing instruction appears as a panacea to some educators, research indicates that the computer alone cannot increase the frequency or sophistication of revisions in students' writing (Balajthy, McKeveny, & Lacitignola, 1987). Researchers have also found evidence that students' attitudes toward writing change as they work with word processors. Positive effects include a greater willingness to revise, to try prewriting techniques such as freewriting, to experiment with words and formats, and to take pride in their written products. Students also demonstrate a greater willingness to pay attention to teacher and peer comments as they work with computers in a writers' workshop environment.

Some researchers who have worked with 13-year-old computer writers suggest that they develop a more positive attitude toward drafting, revising, and using computers than those students with no exposure to computers. They have found that the immediate feedback from other students facilitated through a high degree of printer accessibility increases revising and editing frequency and quality (Tyler Eastman, 1989). On the other hand, other research with this age group suggests that their revisions do not necessarily improve the quality of their writing (Kurth, 1987).

Middle school students who shared their writing with their peers in a computer writing workshop, however, achieved at higher levels than those who did not (Sudol, 1985). They assumed responsibility for recursive revision or re-seeing their writing as they returned to experiment with their works in progress.

Collaborating successfully with their peers while focusing on the writing on the computer monitor appeared to research observers to heighten students' self-esteem as well as writing proficiency (Reynolds & Hart, 1988).

Research suggests that teaching models which foster, encourage, and contribute to the process of writing are more effective in terms of creating confident, productive, and skilled writers than the more traditional product-centered models (Elbow, 1981; Graves, 1985; Perl, 1983). As the writing workshop environment encourages collaborating and sharing work-in-progress, computers facilitate interaction in student-centered classrooms wherein the teacher's role shifts from director-evaluator-judge to collaborator-coach-partner.

It is against this backdrop of active participation in learning that questions about the effectiveness of students' use of computers to write and revise arise. Does the computer influence the manner in which young people write and revise? Does the computer encourage children to use more sophisticated revision strategies than they would normally use with pencil/pen and paper? Does the computer affect children's perceptions or attitudes about writing and revising? Does the computer have any effect on the quality of writing that children produce? (Ritter, 1989)

These questions have led researchers to a new educational philosophy based on cultural materials relevant to intellectual development. Meaningful intervention, Papert suggests, must take the form of working with these trends

(1980). Just as adult entrepreneurs market their ideas via computer, so will student writers express themselves more clearly and publish their writing in the real world, using computer word processing programs. To do this, they must be taught that revision is a way of re-seeing and that writing is a way of thinking and learning.

Statement of the Problem

The literature suggests that word processing reinforces and enhances the dynamic, interactive, social nature of writing in a process writing classroom. Revision is no longer only a means of recopying or retyping. Instead, it becomes a chance to take risks and experience a recursive, thinking while writing process. Research has shown that re-reading, doubling back again and again on what has been written is part of the creative process that advances writers forward (Selfe, 1985). Yet little research has been done to show the effect of combining computer word processor usage with process writing instruction in heterogeneous groups of 13-year-olds. Since most of these learners have completed the final stages of language acquisition and are those students in whom the Piagetian stage of formal operations is complete, a study is needed which investigates the effect of computer assisted word processing on frequency and quality of revision in eighth graders' expository writing.

Purpose of the Study

The purpose of this study is to collect data on the frequency and quality of revision in eighth graders' expository writing in a process approach writing workshop. The effect of computer assisted word processing and revision instruction on the quantity of revisions, the percentage of changes made during the revising stages, and the quality of the final product will be measured. The results of this study should provide a basis for using word processors in a student-centered, middle school writing process workshop. The results may also generate hypotheses for later work to substantiate the findings.

Dependent and Independent Variables

Dependent variables

The variables to be measured in this study are:

* the average percentage of changes made during the revision stage.
* the average percentage of global or structural revisions that change meaning in sentences or paragraphs.
* the average percentage of surface or editing changes that do not change meaning or emphasis in a text.
* the quality of the final writing product as evaluated holistically.
* the students' attitudes toward nine factors related to revising using a word processing program:
  (a) general writing tasks
  (b) use of the writing process
  (c) frequency of revisions
  (d) quality of revisions
  (e) revising with a computer word processor

(f) revising with pen/pencil and paper
(g) peer evaluation effectiveness toward revision
(h) teacher response effectiveness toward revision
(i) definition of the revision process.

* the students' attitudes toward nine factors related to revising using pencil/pen and paper:
(a) general writing tasks
(b) use of the writing process
(c) frequency of revisions
(d) quality of revisions
(e) revising with a computer word processor
(f) revising with pen/pencil and paper
(g) peer evaluation effectiveness toward revision
(h) teacher response effectiveness toward revision
(i) definition of the revision process.

Independent variable

The independent variable in the study is the mode of writing (computer word processor or pencil/pen and paper).

Research Questions

1. Will there be a difference in the average percentage of changes made during the revising stage of the writing process using a word processor or using pencil/pen and paper?
2. Will there be a difference in the average percentage of global or structural revisions that change meaning in sentences or paragraphs using a word processor or using pencil/pen and paper?

3. Will there be a difference in the average percentage of surface or editing changes (spelling, capitalization, punctuation, tense, and number) that do not change the meaning or emphasis of a text using a word processor or using pencil/pen and paper?
4. Will there be a difference in the holistically assessed quality of the final writing product using a word processor or using pencil/pen and paper?
5. Will there be changes in students' attitudes toward revising using a word processor or using pencil/pen and paper?

Limitations

This study was conducted in view of the following limitations:

1. The sample size was small (N = 50).

2. True random sampling was not possible due to previously completed heterogeneous grouping in the school district. However, the mean language scores for the experimental (computer word processing) group was within 2.04 points of the control (pencil/pen and paper) writing group.

3. Almost twice the quantity of time was allowed for the first writing assignment as was given for the second assignment due to the study being conducted in the early fall when students were reviewing the writing process.

4. Exogenous variables such as gender and race were not considered an official part of the study.

5. Aptitude variables (ability and motivation) and environmental variables (home, family, peers, class) were not considered.

6. The researcher could not control the amount of additional practice that some students received with the word processor in computer applications classes during the two-week study.

7. For both writing assignments, students were limited to the personal narrative and persuasive essay. Although they were free to select their own topics, the expository writing assignments limited their audiences and purposes in writing.

8. Students spent considerably more time conferencing with their peers and working in a more interactive environment during the first writing assignment primarily due to the limited time allowed for the second writing assignment.

9. The generalizability of the study is limited to similar size cities and school districts in which teachers use process writing teaching strategies.

Definition of Terms

consolidation–a primary revision operation that places two or more units of thought into one unit; sometimes referred to as sentence-combining (Faigley & Witte, 1981).

distribution–revision operation in which material in one text segment is passed into more than one single unit (Faigley & Witte, 1981).

linear stage revision model–edits surface features of the text to correct errors, including the following series of stages: prewriting [planning], composing [writing], and revising [editing] (Rohman & Wlecke, 1964).

recursive process revision model–weaves through subprocesses (planning, remembering, generating, monitoring, reviewing, evaluating and revising) and requires that a writer notice and resolve discrepancies between what has been written and the intended text (Gendlin, 1978).

revision as re-seeing–a way of seeing one's writing from a new perspective; repeatedly changing the meaning of text to (1) correct faulty or weak content; (2) add or substitute text to clarify original meaning or more suitably meet the needs of a genre; (3) delete, reorder, or restate to create grammatically readable sentences; (4) correct diction and/or syntax errors (Nold, 1979).

structural or global revisions–format changes in word, sentence, or paragraph location (addition or deletion) that change the meaning of the ideas expressed (Faigley & Witte, 1981).

surface or editing changes–mechanical modifications in the following areas: spelling, capitalization, punctuation, tense, number, format that do not change the meaning or emphasis of a text (Faigley & Witte, 1981).

writing–the process of selecting, combining, arranging, and developing ideas in effective sentences, paragraphs, and longer units of discourse (Strand, 1989).

writing process–consists of five recursive stages: pre-writing, writing, revising, editing, and publishing (Strand, 1989).

writing workshop–student-centered classroom environment that encourages collaborating and sharing work-in-progress and shifts the teacher's role from director-evaluator-judge to collaborator-coach-partner (Graves, 1985).

CHAPTER II. REVIEW OF THE LITERATURE

Writing as a Way of Thinking/Knowing

Researchers of written composition focused their attention on writing as a product until a new paradigm emerged in the late 1960s. This new process view of learning to write developed because of the less effective traditional approaches which emphasized form and mechanics before ideas and meanings (Britton, Burgess, Martin, & McLeod, 1975). The shift in attention from product to process coincided with the reemergence of invention as a rhetorical discipline (Young, 1978). However, the dearth of historical research about teaching rhetoric and rhetorical invention led investigators to believe that the slow growth and development of teaching writing resulted from the inadequate preparation of teachers (Applebee, 1974).

Rejecting the traditional teacher-directed method of teaching writing, Janet Emig, in a benchmark study published in 1971, discovered that of 504 studies conducted before 1963 that appear in Research in Written Composition, only two related even indirectly to the process of writing among adolescents. Emig's 1971 research with twelfth graders revealed two modes of composing—*reflexive* (requiring a long period of prewriting, starting, composing aloud, stopping, contemplating the topic, reformulating, and observing the influence of writing on the teacher audience) and *extensive* (prose of a detached and reportorial

classroom nature). Emig, an early proponent of the process writing classroom model, advocated teacher training and a student-centered workshop environment in which teachers and students interact by thinking, inventing, talking, and writing.

In 1970, James McCrimmon advanced a theory of writing as a way of thinking/knowing, not of knowing in order to be able to tell others, but of knowing for self-understanding. This self-discovery mode of writing served as the forerunner of the process approach to writing. McCrimmon recognized that the common element in experienced and inexperienced writers was their need to understand their own views of subjects and to shape impressions into personal interpretations. He contrasted the *real* subject (individual's interpretation) with the *nominal* subject (merely a topic to be explored) and advocated writing for the purpose of interpreting or making choices (1970). McCrimmon's model writing classroom offered a safe workshop in which students and teachers interacted as writers.

Another early advocate of writing as a way of thinking, Donald Murray, in his book A Writer Teaches, urged teachers and students to write to think–to be surprised by what appeared on the page. Like McCrimmon, this process writing evolutionist advanced the idea that through writing one discovers meaning and wants to share it with others. Murray, along with Peter Elbow, stressed the importance of recursive free writing, which he called looping (1973).

Murray's writing process model took many variations until his 1985 process writing model included only three steps: (1) collect, (2) plan, (3) develop. He emphasized the fact that there is not necessarily one correct model.

Did the process approach to teaching writing accomplish its purpose of teaching students to think/write effectively? In 1984, The National Assessment of Educational Progress released a ten-year study of the holistic assessment of the writing of 9-, 13-, and 17-year-olds which revealed that 62% of the 17-year olds, 81% of the 13-year-olds, and 97% of the 9-year-olds could not write adequate informative prose. Asked to write imaginative description, 76% of the 17-year-olds could not do so adequately, nor could 83% of the 13-year-olds nor 95% of the 9-year-olds. Critics of the report claimed that the criteria emphasized thinking skills more than writing skills. The five major objectives of the study included the following: (1) using writing as a way of thinking and learning; (2) using writing for various purposes; (3) managing the writing process (drafting, editing, etc.); (4) controlling the forms of written language (grammar); and (5) appreciating the value of writing. Results of this study showed that teachers were giving greater attention to writing in 1984 than they were in 1974, but students were writing less than one paper a week in all their subjects. Recommendations clearly indicated the need for students to write for meaningful reasons for real audiences, to receive constructive responses to their ideas (peer evaluation and portfolio grading), and to receive continuous support for writing attempts (NAEP Writing Survey, 1974–1984, in Soltis and Walberg, 1989).

Proponents of writing as a way of thinking suggest that writing is a form of problem solving and that writing enhances and refines thinking (Wasserman, 1980; Olson, 1984; Selfe, 1985). They contend that the six levels of Bloom's

taxonomy (knowledge, comprehension, application, analysis, synthesis, and evaluation) correlate with the parts of the writing process (prewriting, writing, rewriting, revising, and editing). Leading students into writing activities is a natural progression in sequencing instruction. Writing is a measurable and demonstrable activity. By maintaining writing portfolios, teachers can easily demonstrate student progress, effort, and attainment in thinking/writing (Atwell, 1987).

Writing as a Process

According to the National Council of the Teachers of English, the operational definition of *writing* is the process of selecting, combining, arranging, and developing ideas in effective sentences, paragraphs, and longer units of discourse (Strand,1989). This process consists of five recursive stages: (1) pre-writing—broadening or narrowing a topic, choosing scope and direction of a writing project; (2) writing— [concerned with content, not mechanics] composing thoughts, ideas, and feelings; (3) revising—changing rough and subsequent drafts, still focusing on content, securing peer and teacher feedback, beginning to see a variety of choices and becoming more flexible, manipulating language and ideas [seeing words as temporary]; (4) editing—focusing on mechanics, preparing for publishing, repeating peer and teacher feedback, beginning to see purpose in mechanics of language because of communication

process between author and audience; (5) publishing—sensing ownership and accomplishment; realizing communication through written language.

The features of a process approach to writing include the following: (1) an environment that allows time to think, reflect, and write; (2) teachers who model listening and observing; (3) limited teacher feedback; (4) self-selection of topics that encourage a sense of ownership and authorship; (5) class share time that provides for immediate feedback; (6) journals and writing folders; (7) collaboration and teacher modeling to help students learn to share ideas for improving content and mechanical concerns (Strand, 1989).

Some of the benefits of the process-oriented writing programs include: (1) increased student interest in writing, responding, and collaborating; (2) development of active energetic writers' voices; (3) writing, thinking, and learning across the curriculum (Auten, 1988). The benchmark study by Janet Emig (1971) preceded nearly 20 years of research which suggests that process writing leads to real understanding since writing forces students to verbalize their inner voices and also to transfer learning from one context to another.

Even though extensive research supports the effectiveness of the process approach to teaching writing, in 1988 fewer than 20% of English teachers had received training in this method of teaching (Auten, 1988). One exception to this lack of teacher training in the process approach was found in Iowa, where over 5,000 teachers have participated in the Iowa Writing Project since its inception in 1978 (May, 1989). Modeled after the California Bay Area Writing Project, the Iowa

Writing Project focuses on professional learning with half the time spent actually writing and responding in an interactive writing workshop and the other half engaged in discussion about professional literature dealing with the facets of the writing process (Davis, 1989). Opportunities are available across the United States for teachers to participate in the National Writing Project, but narrow curriculum mandates toward basic skills learning appear to have weakened teacher motivation. As the process approach to writing has gained in popularity in the past two decades, teachers and students have recognized the irrelevancy of the isolated study of traditional grammar, diagramming sentences, and sequential skills (sentences, paragraphs, etc.). Researchers indicate that these types of activities have no effect on raising the quality of student writing (Hillocks, 1984). Kirby and Liner suggest that by drilling on one of the mechanical or structural facets of writing, teachers may even be diminishing motivation and destroying the effectiveness of the writing process (1980).

As teachers model the various parts of the writing process, they are perceived by their students as fellow writers. The instructional skills of monitoring and adjusting become important as teachers facilitate peer evaluation in group conferences that lead to meaningful revisions in writing. Student attitudes toward revising become more positive as they realize that every piece of writing does not have to be perfect; then, the student, through covert participation in "think" time, has time to experiment with his/her ideas, rethink/rewrite, and finally edit and publish a completed writing project.

Revision as a Way of Re-seeing

Revision is no longer interpreted in a linear sense (what the writer does once a rough draft is completed). Instead, revision is a way of seeing one's writing from a new perspective or re-seeing it (Murray, 1978). It is a recursive step in the process of writing that may be repeated as many times as needed to produce a text worth editing (Murray, 1985). Revision then becomes (1) changing the meaning of text to correct faulty or weak content; (2) adding or substituting text to clarify original meaning or to more suitably meet the needs of a genre; (3) deleting, reordering, or restating to create grammatically readable sentences; (4) correcting diction and/or syntax errors (Nold, 1979).

Most of the research on revision in writing deals with *when* subjects revise, *what* they revise, and *what differences* exist between the various levels of experience in writers (Humes, 1983). Younger writers resist revising, but eventually see a first draft as malleable (Gentry, 1980). They tend to make more superficial changes than do more experienced writers who feel the need to restructure and reshape their writing (Sommers, 1980). The key to motivating students to revise their writing is to help them re-see or rediscover meaning in their writing. To do that, the student needs to be free to select a topic that has meaning to him/her (depending on his/her personality type) and also free to respond to those who evaluate the writing in peer groups (Jensen & DiTiberio, 1989). Revision is then perceived as a continual process that helps writers learn what they have to say and reconsider and restructure clearly for an audience.

Computers as Enablers in the Revision Process

Currently one of the easiest ways to encourage children and adults to participate willingly and enthusiastically in the writing process is to integrate computer assisted word processing into the curriculum. Henry Jay Becker's idea that computers serve people best when they serve as special purpose tools to help accomplish goal-related tasks catapults young writers into the adult computer age by empowering them to use computers as adults use them (1984). Like Papert and Workman as well, Becker contends that word processing programs offer the capacity to help students make repeated attempts to improve the precision and productivity of their expressed thoughts (Workman, 1983).

While there is a wealth of research expounding the value of computers as facilitators of the writing process, there are some concerns that educators must first address. Word processing instruction needs to precede the use of the word processor in the writing process. Keyboarding skills must be taught with sufficient time to practice in order to maintain the skill level (Wetzel, 1988). To avoid confusion, the use of each new word processing program must be taught prior to writing tasks so that students learn to access the program, enter and edit text, and retrieve files.

Next, teachers must consistently allow students to select their own writing topics to insure a willingness to revise (Leonardi and McDonald). Persuasive writing assignments motivated sixth- and seventh-grade students to revise more than other types of writing (Afflerbach, 1985). Students should be taught

prewriting skills and self-checking skills. With teacher supervision, they will then be ready for computer-based writing activities, such as collaborative writing, peer evaluating, and revising (Leonardi and McDonald, 1986).

Defining revising is important lest students confuse it with editing. Initial research indicates that unless students are taught revision strategies, they may write *more* text with a word processor, but the quality of their writing is not significantly improved (Kurth, 1987; Riel, 1983).

Researchers agree that there are many advantages for using word processors to teach writing. Students: (1) spend more time composing and write longer texts when using a word processsing program (Kane, 1983; Hawisher, 1986; Appleby, 1988); (2) display a more positive attitude toward writing using computers (Daiute, 1982; Johnson & Sterkel, 1984; Kurth, 1987); (3) work as partners with their peers and teachers, sharing information and learning (Selfe and Wahlstrom, 1986); (4) collaborate and write more freely and easily, enjoying a heightened sense of audience and immediate feedback from their peers (Thompson and Jarchow, 1983; Hawisher, 1986); (5) become risk-takers as they perceive writing as a cognitive and physical activity that takes place continually as one writes (Sommers, 1980; Humes, 1983; Becker, 1984); (6) make two-thirds more revisions (word substitutions and reordering sentences twice as often) using word processors (Collier, 1983); (7) feel encouraged to revise because they can change text by giving commands rather than recopying (Daiute, 1982; Reynolds &

Hart, 1988); (8) are motivated to make higher level thinking types of revisions such as those which improve idea content and coherence (Balajthy, McKeveny, & Lacitignola, 1986–87).

Over half of the advantages of using word processors in teaching writing relate directly to the revision portion of the writing process. However, research does not support the hypothesis that students automatically revise and compose more successfully using word processors. They limit their changes to superficial, mechanical alterations unless directed by a teacher to make more sophisticated revisions (Collier, 1983; Kane, 1983). Therefore, the teacher holds a powerful responsibility for creating a classroom environment in which students and their instructor share information and learning as they work through the writing process together (Pufahl, 1984).

In an effort to accommodate students' needs, Dawn Rodrigues (in a study of inexperienced writers in a college basic English class) treated the computer laboratory as a writer's workshop (1985). Allowing four days for students to move from pre-writing to editing on each assignment, she urged students to work in groups in all phases of the writing process. She sequentially taught new word processing skills, such as block moves at different points during a semester. Eleven of twelve students in her class indicated that they improved in attitudes toward writing. She observed that using the computer reduced students' writing apprehension and also improved their collaborative revision efforts as they focused on content and structure first, style and mechanics later (D. Rodrigues,

1985). Unlike experienced writers in Bridwell's study, who were hampered by seeing only a small part of the screen at a time, these basic English class writers found that seeing only a portion of the text at a time helped them focus on only one change at a time before moving forward in their revision efforts (Bridwell, 1985; D. Rodrigues, 1985). Ronald Sudol shared Rodrigues' enthusiasm for the workshop approach and claimed that word processing combined with process writing instruction enabled his students to be more active and effective collaborators in their writing and revising (1985).

Daiute's research concluded that students also make fewer mistakes using word processors (1986). Duling's research, which required students to write first drafts by hand and to revise after typing text with a word processor, also showed fewer errors in final drafts (1985). Woodruff and fellow researchers found increased technical proficiency in final drafts when enriched and average eighth grade students used word processors (1986).

Students' perceptions of themselves as risk-takers improve as they perceive themselves as in control of the continual cognitive and physical activity of revising at the computer. Daiute's research using text editors in children's writing suggests that word processing student writers are more likely to monitor their own thinking and use computers for storing information, correcting spelling, recopying, and reformatting text. They free themselves for higher level thinking (1983).

On the other hand, Jeanette Harris presented a more critical view. While the students in her college freshman English class agreed in theory that they felt free to take risks or experiment in writing using word processors, in practice they seldom modified anything longer than a sentence (1985). Similar discrepancies between student perceptions of themselves as revisers of writing and those of their teachers were found in a study of 46 sixth-graders at Anson Middle School in Marshalltown, Iowa (Yocum, 1991). While their teachers noted few total revisions, 57% of the students said in a survey that they changed words and sentences when revising. While 67% claimed that they improved spelling and punctuation, only 23% felt that they moved or reorganized sentences and paragraphs. Seventy-eight percent of these sixth-graders agreed that they revised more often when writing at a computer (Yocum, 1991).

A significant recent study of middle school students as revisers may be found in Susan Tyler Eastman's *Writing with Computers: Accommodation, Achievement, and Attitudes* (1989). Using a computer per student, Eastman found that students developed a more positive attitude toward drafting, revising, and using computers than did those with no exposure to computers. Teaching was most effective in process-based and cooperative learning mini-lessons. Immediate feedback from other students was provided through a high degree of printer accessibility. This response to immediate peer sharing of the writing led to increased revising and editing of students' work. The study concluded that the

use of computers, printers, lessons, and learning environment contributed to statistically significant, increased frequency and quality of revision as a writing skill (Tyler Eastman, 1989).

Research presented in the *Fourth National Assessment of Writing* indicates that revision strategies are still not being taught in American public schools (Fitzgerald, 1987). Further research confirms that what 11–13-year-olds currently do to revise their compositions does not increase the quality of their writing (Kurth, 1987). Middle school students who shared their writing with their peers achieved at higher levels than those who did not (Pascarella & Pflarem, 1980).

The workshop approach to teaching process writing using word processors emerges as the environment which best encourages a sense of enterprise and accomplishment among students (Sudol, 1985). They assume responsibility for their recursive re-seeing or revising as they return to experiment with compositions that are perceived as dynamic entities (Reynolds & Hart, 1988). Yet they derive heightened self-esteem as they collaborate successfully with their peers, focusing on the writing that appears on the computer monitor whether it permits them to learn cooperatively within the room or across the country via a long distance network.

If the secondary analysis of the Fourth National Assessment of Educational Progress in Writing is correct, peer group influence and peer conferencing contribute positively to learning outcomes in writing. Perhaps in the computer writing workshop the same spirit of cooperation will combine

effectively with computer assisted word processing instruction in the writing process to further develop thinking/writing skills in 13-year-olds, who are old enough to have well-developed language skills, but are young enough to have a typical four years of high school ahead of them to mature as writers. Currently little is known about the writing ability of this age group (Applebee, 1981).

Summary

Process writing has evolved over the past twenty years as a form of problem solving that enhances and refines thinking. The benefits of process writing programs include increased student interest in writing, responding, and collaborating to verbalize and transfer learning from one content area to another. Although inexperienced writers make more superficial changes than experienced writers, they can be motivated to re-see or rediscover meaning by selecting their own topics and responding to peer evaluators' suggestions for global revisions.

To improve the precision and productivity of young adolescent writers, educators have integrated computer word processing into process writing curriculums. Young adolescents and their teachers have recognized the advantages of using computer word processors to facilitate higher level thinking types of revisions that improve content and coherence. They spend more time composing and display a more positive, risk-taking attitude toward revising as they feel empowered to improve their writing by changing text through giving

commands rather than by recopying. This increased positive attitude toward drafting, revising, and using computers suggests the need for a study of middle school students' frequency and quality of revisions in expository writing.

CHAPTER III. METHODOLOGY

This chapter describes the methodology used to examine the research problems. Sections included in this summary pertain to subjects, development of the instrument, research design, research procedures, limitations, and data analysis.

Subjects

Eighth-graders in the required language arts classes at Anson Middle School in Marshalltown, Iowa, were heterogeneously grouped in six sections. Two of the six sections were used to provide experimental and control groups. The experimental (computer word processing) group was selected because the class met during the computer literacy teacher's planning period, the only time when a class set of computers was available. The control group was selected on the basis of being equal in size to the experimental group.

Both the experimental and control groups consisted of 10 boys and 15 girls. There were four students with learning disabilities in the experimental and two in the control group. Twenty-three students in each group were Caucasian while one student in each group was African American and one student in each group was Asian. Consequently, there was a gender and racial balance.

Mean scores for the two groups on the writing skills component of the Iowa Tests of Basic Skills were within 2.04 points of each other. The

experimental (computer word processing) group's mean score was 68.08, and the control (pencil/pen and paper) group's mean score was 70.12. There were four students in each group who scored over 90% and three students in each group who scored below 50% in the national percentile rankings.

All subjects took the pretest relevant to student attitudes toward writing and particularly toward revision before the experiment began, and all of them took the posttest at the end of the study.

This research was limited to 25 eighth graders in the experimental group who received process writing instruction using Apple IIe/gs computers and the AppleWorks word processing program and the other 25 students in another section who received process writing instruction using pencil/pen and paper in the regular classroom. The computers were not networked, but an LCD screen and overhead projector were available for large group visibility, and the computers were attached to ImageWriter printers with the ratio of four computers per printer.

Research Design

Since neither full control over the scheduling of experimental conditions nor the ability to randomize could be realized in this research to be conducted in the classroom, a quasi-experimental design was used with an experimental and a control group measured at two different times. This two-group time-series design included measurement of both computer assisted word processing

instruction in a process writing workshop for the experimental group and pencil/ pen and paper composition instruction in a process writing workshop for the control group. The study took place over a thirteen-day period.

Research Procedures

Beginning activities

The proposal for this research was approved by the Iowa State University Human Subjects Committee. A copy can be found in Appendix C. Permission was obtained from the Marshalltown Community School District to study two classes of eighth graders at Anson Middle School. A copy of the school's consent letter may be found in Appendix C. The building principal and student teacher working with the researcher/ language arts teacher reviewed procedures and process writing lesson assignments before beginning the study.

The study was carried out in the Apple IIe/gs computer lab and in the regular eighth grade language arts classroom at Anson Middle School. The lab contained 30 computers which were not networked but which were connected to ImageWriter printers with a ratio of four computers per printer. First and final drafts were collected for two writing activities over a thirteen-day period from September 16–30, 1991.

Students participated in two writing assignments. The experimental group composed at the computers in the computer lab while the control group wrote with pen/pencil and paper in the regular eighth grade language arts

classroom. The writing assignments were comparable in level of difficulty, but the first personal narrative writing assignment reviewed the writing process and took eight days to complete while the second persuasive writing assignment required only four days to finish.

On the first day of the study, the researcher explained to the students that they would be participating in a research study to investigate frequency and quality of revision. All students received needed instructions and completed the pretest questionnaire (Appendix A).

On the second day of the study in the experimental group, the researcher introduced the students to the AppleWorks word processing program. The student teacher served as the keyboarder, and using an LCD screen and an overhead projector, she demonstrated the following: (a) accessing the AppleWorks word processing component, (b) creating a file, (c) using the options, (d) saving a file to a data disk. The students then practiced the processes modeled and created a file entitled *Journal* and completed freewriting for a first journal entry by using the autobiographical anecdote topic which was a part of the first assignment. The researcher and the student teacher circulated, observed, and offered assistance when needed.

In the regular classroom the researcher explained the interactive writing workshop classroom model and portfolio record keeping system. She then described the function of the journal, and students freewrote relevant to the first autobiographical anecdote assignment.

Writing assignments

The third and remaining ten meeting days were devoted to the two writing assignments. Two printouts were filed for each student in the experimental group from each of the two writing assignments: a first draft and a final draft. In the control group, comparable pen/pencil and paper drafts were collected and stored in portfolios in the regular classroom.

Prior to the start of each of the writing assignments, the researcher read an example to the students and then briefly discussed it. These example essays can be found in Appendix J.

For the first assignment, students worked together with the researcher to review the writing process, and together they brainstormed topic ideas and composed a first draft of a group essay. They used the LCD screen, overhead projector, and computer in the experimental group and the blackboard, overhead projector, and large newsprint paper in the regular classroom.

After completing the group effort, students worked individually to compose first drafts. The researcher and student teacher modeled revision strategies in both classes and demonstrated computer word processing commands for the experimental group to facilitate students rearranging and reorganizing words, sentences, and paragraphs within their essays. The revision strategies were demonstrated using large newsprint paper, markers, scissors, and tape in the regular classroom for the control group.

After completing a first draft, students were encouraged to reread their writing and follow the recursive revision strategies modeled so that they included an autobiographical anecdote with dialogue in their personal narrative essays. They were also given time to work with their classmates in peer evaluation of the various drafts. The first lesson was designed to lead students through prewriting, drafting, revising, proofreading, and editing toward publishing. To encourage the students to move freely from one phase to another, a short recursive computer lesson file was used in the experimental group and a similar recursive revision lesson was taught using pen/pencil and paper in the control group (Appendix H).

Because the first assignment reviewed the process of writing along with the personal narrative essay, it required eight days for completion. The second assignment again required students to write individually either at the computer in the experimental group or with pen/pencil and paper in the control group. It further allowed for practice of the writing process that would be used in the language arts classroom for the rest of the school year.

In the second assignment, students individually composed persuasive essays on topics about which they felt strongly. A revision checklist was used in peer evaluation groups to remind students of revision strategies they had previously learned (Appendix F). The second lesson also stressed organization of an argumentative proposition for the thesis sentence in the first paragraph of

the essay. Students were asked to include two or three major points and a personal experience to support their persuasive arguments. These variations in the assignments were included in the rubrics for holistic evaluation found in Appendix I.

Definitions of terms, examples of revision strategies, and teacher modeling were all a part of both lessons. Appendix G describes the role of the teacher/facilitator of revision. However, students were expected to implement those revision techniques they learned in assignment one as they worked through assignment two. Peer response and evaluation as well as a time for whole class sharing of the writing were facets of both writing workshop designs. Students printed a first draft and a final draft in the experimental group. They filed in their portfolios in the regular classroom comparable pen/pencil and paper drafts in the control group.

On the thirteenth day of the study, the students completed the posttest questionnaire. They also responded to interview questions posed in individual conferences with the researcher. These questions are found in Appendix B.

Development of the Instrument

An attitudinal questionnaire was designed to measure subjects' attitudes toward the following: (a) general writing tasks, (b) use of the writing process, (c) frequency of revisions, (d) quality of revisions, (e) revising with a computer word processor, (f) revising with pen/pencil and paper, (g) peer evaluation group

effectiveness toward revision, and (h) teacher conferencing effectiveness toward revision. The questionnaire itself was based on information presented through the Iowa Writing Project and several other related studies of student attitudes toward writing with and without computers (Allen, 1990; Applebee, 1974, Johnson & Sterkel, 1984; Humes, 1983; Kurth, 1987). Procedures for constructing the instrument were based on information found in *How to Measure Attitudes* (Henerson, Morris, & Fitz-Gibbon, 1987).

The first step in developing the questionnaire was to collect statements that clearly differentiated between favorable and unfavorable opinions regarding the following: (a) general writing tasks, (b) use of the writing process, (c) frequency of revisions, (d) quality of revisions, (e) revising with a computer word processor, (f) revising with pen/pencil and paper, (g) peer evaluation group effectiveness toward revision, and (h) teacher conferencing effectiveness toward revision (Allen, 1990; Greer, 1991; Sullivan, 1989). Statements that favored frequency and quality of revising process writing or using a computer were considered to represent favorable opinions. About half of the statements were obtained from studies of student attitudes toward the computer (Allen, 1990; Greer, 1991; Sullivan, 1989). Other questions for which no instruments from previous studies could be found were constructed by the researcher. These statements related directly to frequency and quality of revision.

Content validity, the degree to which an instrument represents the content that the test is designed to measure, was a primary concern for the

researcher. This type of validity is most often determined by a professional appraisal. One university professor and two middle school language arts teachers were given a list of objectives and asked to determine if the statements would measure attitude toward revision in process writing and toward using computer word processors in implementing revision strategies (Appendix D). They were also asked to comment on the appropriateness of the questionnaire for eighth grade students who were familiar with the writing process and computers. Their suggestions were used to modify the instrument. The questionnaire was pilot tested in an eighth grade language arts class at Anson Middle School in Marshalltown, Iowa, on August 30, 1991. Twenty-five students who had completed a computer keyboarding class and were familiar with FredWriter and AppleWorks word processing programs responded to each of 25 questions using a Likert-type agreement scale with the following values:

1 = strongly disagree

2 = disagree

3 = not sure

4 = agree

5 = strongly agree

Based on the eighth graders' comments, questions, and concerns, the instrument was once again modified.

Reliability of the Instrument

In order to test the internal consistency of the twenty-five item instrument, Cronbach alpha reliability coefficients for each attitude were measured using the Cronbach alpha technique. Items were omitted if they reflected a weak or negative correlation with other items that were constructed to measure the same attitude. This resulted in the retention of 20 attitude questions and the addition of 10. The reliability coefficients for the attitude factors, based on the second administration of the questionnaire to the students, were as follows:

(a) general writing tasks, .92

(b) use of the writing process, .88

(c) frequency of revisions, .92

(d) quality of revisions, .73

(e) revising with a computer word processor, .82

(f) revising with pen/pencil and paper, .80

(g) peer evaluation group effectiveness toward revision, .72

(h) teacher conferencing effectiveness toward revision, .80

The overall reliability coefficient for all 30 attitude statements was .73.

The final instrument contained five items measuring background information and 25 attitude items measuring nine attitude factors. These nine attitude factors consisted of the following items on the attitude questionnaire:

(a) general writing tasks–items 1, 2, 3

(b) use of the writing process–items 4, 9, 10, 18, 20

(c) frequency of revisions–items 5, 18

(d) quality of revisions–items 6, 7, 8

(e) revising with a computer word-processor–items 24, 25, 26, 27, 28, 29

(f) revising with pen/pencil and paper–items 12, 30

(g) peer evaluation effectiveness toward revision–items 13, 15, 16, 19

(h) teacher response effectiveness toward revision–items 11, 12, and 14

(i) definition of revision process–9, 21, 11, 23

These attitude items were randomly distributed throughout the attitude section of the survey questionnaire. The questionnaire was administered to the 50 subjects the day before the first writing session and again the day after the last writing session. This instrument can be found in Appendix A.

Analysis of the written assignments

The first and final drafts were analyzed and compared by the researcher, using the taxonomy described in the Revision Analysis section, to determine the number of revisions and edits made. The final drafts from both writing assignments were holistically graded by a team of three experienced process writing instructors at the middle school level in the Marshalltown Community School District.

Holistic evaluation The theory on which holistic scoring is based maintains that the whole of a piece of writing is greater than any of its parts. Although in an analytic reading teachers may not agree on the weight to be

given a particular trait, the same teachers will, in judging a work as a whole, rank papers in much the same way. Judgments are made in about two minutes as an evaluator judges each anonymous paper independently. Guidelines for holistic scoring include the following: (a) Read the piece of writing just once and rate it on the basis of the impression from that first reading. (b) Consult the rubric to see what descriptors apply. (c) Record the numerical rating. (d) Do not react or say anything that will affect the objectivity of another scorer. (e) Reconcile invalid scores (Educational Testing Service, 1976).

Two rubrics, each containing a set of criteria used by the graders of this study, were used to rate the students' essays on content, organization, vocabulary, and mechanics. The basic rubrics to be used were formulated by a team of eighth grade language arts teachers in the Marshalltown Community School District who participated in the school district's writing assessment in May, 1991. While the basic rubrics were the same for both assignments, additional specific rubrics were added for each of the two assignments (Appendix I). The first assignment required that the student include a generalization and support it with an autobiographical anecdote. As the anecdote served to make a point, that concept also became a part of the rubric. The anecdote was to prove the generalization. These three ideas were added to the general rubrics for assignment one.

Assignment two included the additional rubrics that the writer convince his/her reader to either agree with him/her, that the essay appeal to reason, and

that the writer include a proposition statement in his/her thesis and return to it at the end of the essay. These additional rubrics (Appendix I) were added to the original rubrics after discussing the evaluation with the three middle school teachers. Grades were based on a scale of one to four, with four being the highest possible score.

Revision analysis The revision analysis was completed using a classification system adapted from Faigley and Witte (1981). This taxonomy helped determine the types of changes students made when they revised in both the computer word processing experimental group and in the pen/pencil and paper writing control group. Faigley and Witte's taxonomy classified global (structural) and editing (surface) changes as the two basic types of revision.

Global or structural revisions included format changes in word, sentence, or paragraph location (addition or deletion) that changed the meaning of the ideas expressed. For example, relocating a thesis or purpose statement from the beginning to the end of a paragraph would count as a revision because it would change the emphasis of ideas within the paragraph and/or essay. Each global change was coded as a revision. The taxonomy classifying revision changes that gave new meaning or emphasis to the text included the following: (a) additions, (b) deletions, (c) substitutions, (d) rearrangements, (e) distributions, (f) and consolidations (Faigley & Witte, 1981).

The taxonomy that represented a lower level of sophistication of revision described as edits or surface changes included modifications that preserved the

meaning and emphasis of the text. Edits included such items as combining sentences when the meaning and emphasis remain the same. Edits also included mechanical surface-level changes in the following areas: (a) spelling, (b) capitalization, (d) punctuation, (d) tense, (e) number, (f) format (Faigley & Witte, 1981). Each change from the first draft to the final draft was coded as either a revision or an edit.

Audio taped interviews After the writing assignments were completed, informal interviews with each of the students of varying abilities were audio tape recorded to determine student reactions to learning revision strategies in both the computer word processing experimental group and the pen/pencil and paper control group. These open-ended, informal interview questions can be found in Appendix B. The researcher then developed a summary of student responses from the audio taped interviews (Henerson, Morris, & Fitz-Gibbons, 1987).

Posttest questionnaire During the final class session (Day 13), students completed the attitude questionnaire once again (Appendix A). The purpose for administering the questionnaire a second time was to measure any changes in attitude toward frequency and quality of revisions and toward writing with the computer.

Analysis of the Data

Data from the writing samples were analyzed using the SPSSX procedure for paired t-test to determine any statistically significant differences in frequency and quality of revision between the computer word processing experimental group and the pen/pencil and paper control group.

Data from the questionnaire were analyzed using the SPSSX procedure for one-way ANOVA to determine any changes in attitude that occurred on the nine attitude factors.

Responses from the informal interviews took the form of a summary of open-response data (transcribed conversation), and since these were informal interviews, only percentages of categorized responses were recorded.

CHAPTER IV. RESULTS AND FINDINGS

In this chapter, results and findings are presented in relationship to the research questions explained in Chapter 1. For the first four research questions, an analysis was conducted of the number of total changes, global or structural revisions, and surface or editing changes made by the students in the experimental (computer word processing) and control (pencil/pen and paper) groups. The number in each category was then divided by the number of words in the first draft and multiplied by one hundred in order to calculate the percentage of total changes, global or structural revisions, and surface or editing changes. For example, one student made ten changes in writing activity one and produced two hundred words on the first draft. This student's percentage of changes was calculated as 10/200*100, which resulted in 5.00% changes.

Cochran Cox two-sample tests were carried out to test the significance of the difference between the mean percentage of total changes, global or structural revisions, and surface or editing changes made by the experimental and control groups. This test was used because variances between the two groups were not equal. A t-test was also conducted for the difference in quality of the final written drafts produced by students writing with computer word processors and students writing with pencils/pens and paper.

Research Question 1

The first research question was stated as follows: Will there be a difference in the average percentage of changes made during the revising stage of the writing process using a word processor or using pencil/pen and paper?

T-test results (Table1) indicate a significant difference in the percentage of total changes made between the groups (t = 3.18). The percentage of total revision changes for the experimental group ranged from 3.13% to 60.47%; the average percentage of changes was 9.10%. The percentage of total changes for the pencil/pen and paper writing group ranged from 1.36% to 18.18% with a mean of 5.14%. Figure 1 further illustrates the differences between the experimental and control groups' total changes in revision.

Table 1. T-test comparison of experimental group total changes and control group total changes in revision

Groups	N	Mean	SD	t	sig.
Experimental	25	9.10%	4.90	3.18	<.01
Control	25	5.14%	6.12		

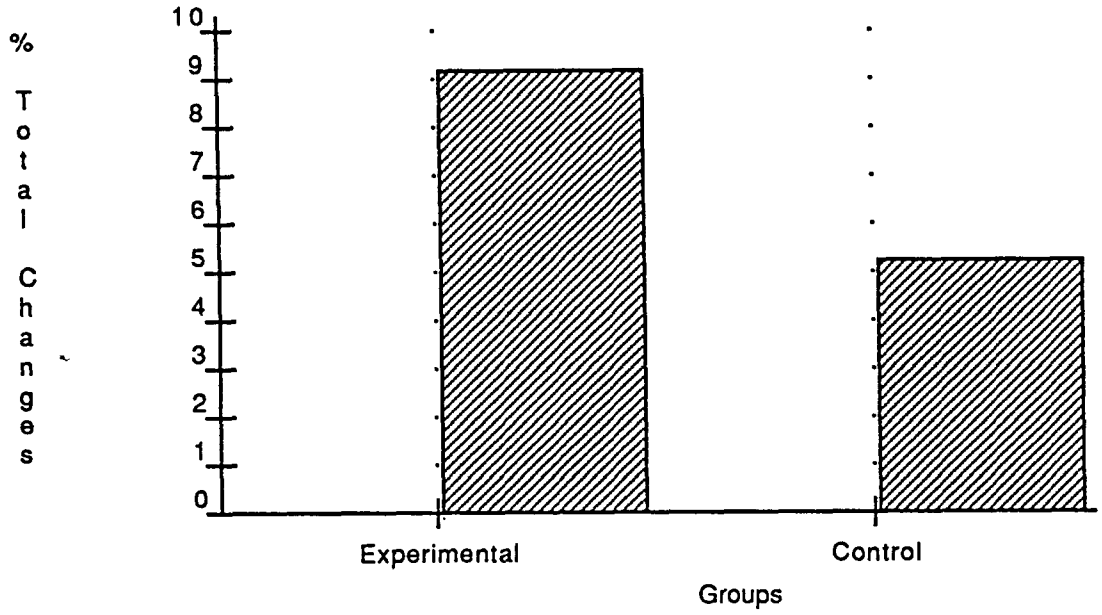

Figure 1. Comparison of average percentage of experimental group and control group total changes

Research Question 2

The second research question was stated as follows: Will there be a difference in the average percentage of global or structural revisions that change meaning in sentences or paragraphs using a word processor or pencil/pen and paper?

T-test results (Table 2) indicate that there was a significant difference in the percentage of meaning-changing revisions made between the experimental group and the control group ($t = 5.51$). The percentage of total meaning-changing revisions made by the computer assisted word processing group ranged from 1.6%

to 9.73% with a mean of 3.45%. The percentage of total meaning-changing revisions for the pencil/pen and paper group ranged from .36% to 3.11% with a mean of 1.22%. Figure 2 further illustrates the difference between the experimental (computer word processing) and control (pencil/pen and paper) groups' total percentages of meaning-changing revisons.

Table 2. T-test comparison of experimental group meaning-changing revisions and control group meaning-changing revisions

Groups	N	Mean	SD	t	sig.
Experimental	25	3.45%	1.87	5.51	<.01
Control	25	1.22%	.77		

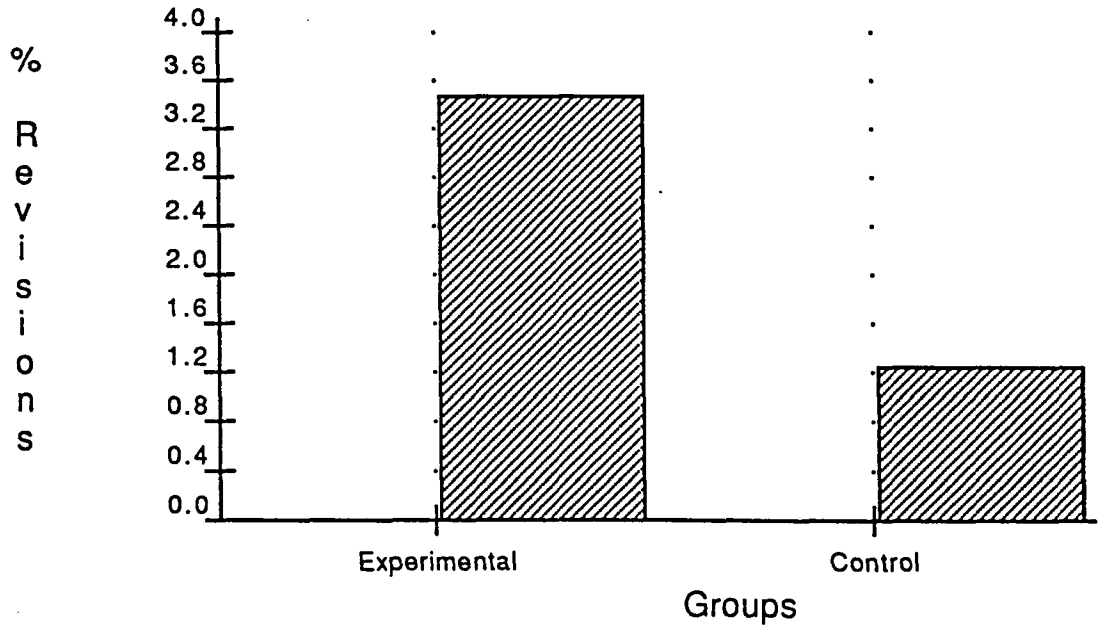

Figure 2. Comparison of average percentage of experimental group and control group meaning-changing revisions

Research Question 3

The third research question was stated as follows: Will there be a difference in the average percentage of surface or editing changes (spelling, capitalization, punctuation, tense, and number) that do not change the meaning or emphasis of a text using a word processor or using pencil/pen and paper?

T-test results (Table 3) indicate that there was not a significant difference in the percentage of surface or editing changes made by the experimental (computer word processing) and control (pencil/pen and paper) groups (t = 1.73). The percentage of total surface or editing changes for the experimental group ranged from 1.46% to 16.94% (mean of 5.65%). Overall edits made by the control group ranged from 0.65% to 16.82% with a mean of 3.91%. Figure 3 further illustrates the differences between the groups.

Table 3. T-test comparison of experimental group surface or editing changes and control group surface or editing changes

Groups	N	Mean	SD	t	sig.
Experimental	25	5.65%	3.57	1.73	>.05
Control	25	3.91%	3.51		

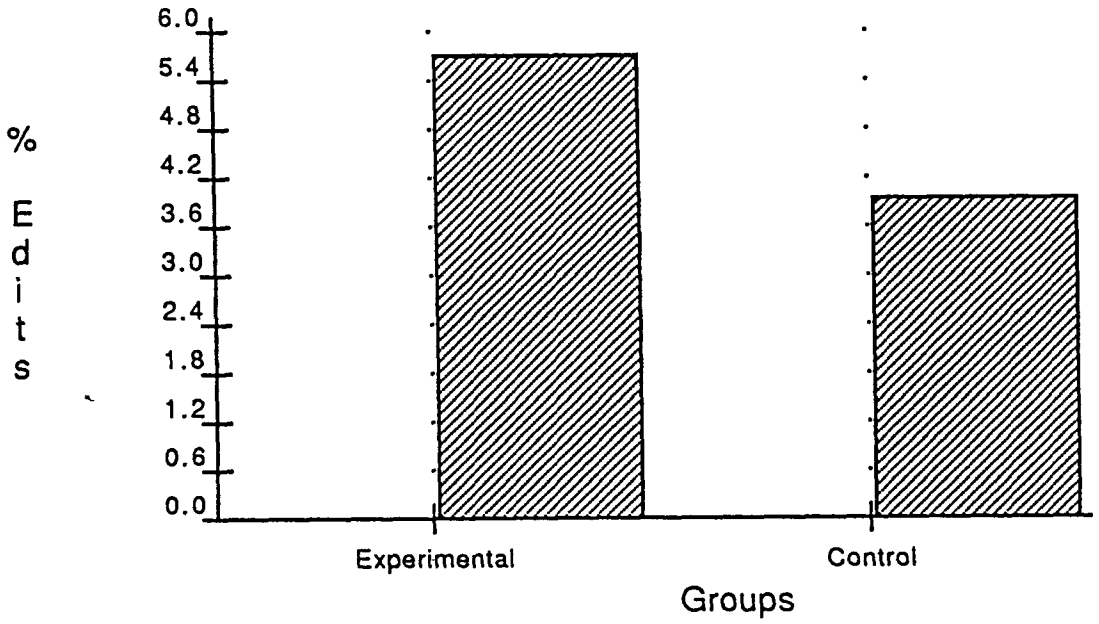

Figure 3. Comparison of average percentage of experimental group and control group surface or editing changes

Research Question 4

The fourth research question was: Will there be a difference in the quality of the final written product when students write using the computer word processor or when they write using pencil/pen and paper?

As shown in Table 4, there was not a significant difference between the mean holistic scores of the experimental group and the control group ($t = .62$). Possible scores on the writing assignments ranged from 1.00 to 4.00 with 1.00 representing the lowest quality paper and 4.00 representing the highest. The scores on the computer assisted word processing (experimental) group's

writing assignments ranged from 2.00 to 4.00 with a mean of 2.88. The holistic scores from the pencil/pen and paper (control) group ranged from 1.5 to 3.5 with a mean of 2.78. The difference between the mean holistic scores reflecting the quality of final drafts showed that the experimental group writers averaged .10 points higher on their final drafts than did the control group students. Figure 4 further illustrates the small difference between experimental and control groups' quality of final drafts.

Table 4. T-test comparison of experimental group mean holistic scores on the combined assignments and control group mean holistic scores on the combined assignments

Groups	N	Mean	SD	t	sig.
Experimental	25	2.88	.53	.62	>.05
Control	25	2.78	.61		

Research Question 5

The fifth research question was stated as follows: Will there be changes in students' attitudes toward revising using a word processor or using pencil/pen and paper?

Students' attitude scores were measured using scales that were composed of certain attitude items on the questionnaire designed by the researcher. Students' answers on each attitude item that contributed to an attitude scale were summed and divided by the number of items contributing

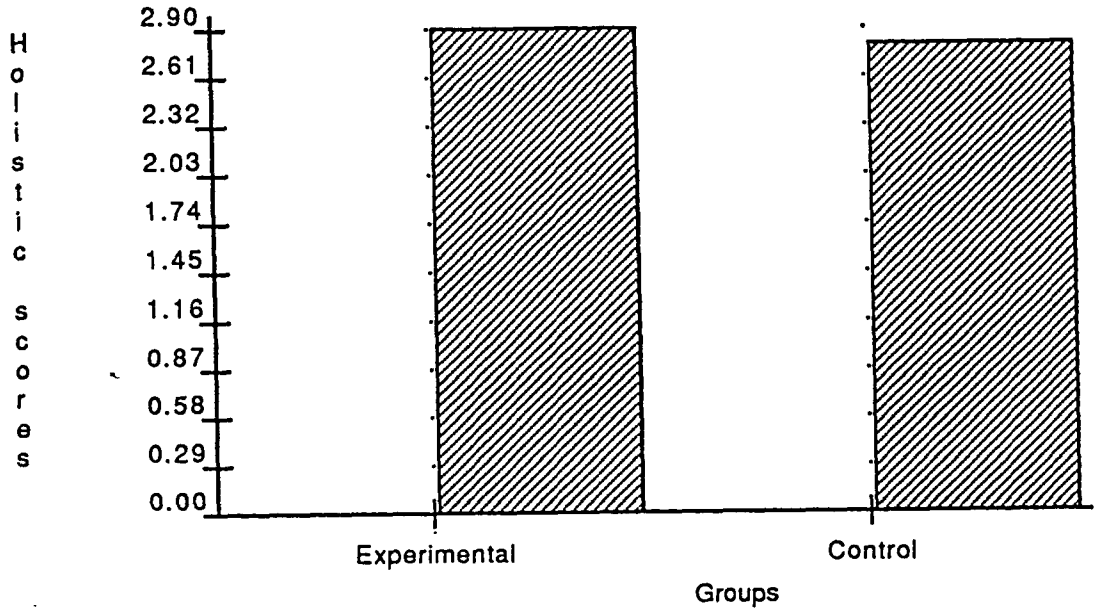

Figure 4. Comparison of experimental group and control group quality of final draft as shown by mean holistic scores

to the scale to yield an average item score for the attitude scale. On the questionnaire, a "5" answer was coded as the highest positive score, with a "1" answer representing the lowest positive score. Each student completed the the two essay writing assignments. Scores on the questionnaire for these writing attitudes will be discussed as they relate to specific aspects of the revision process as well as to the use of the computer word processor.

General writing tasks

The overall average item score for the attitude toward general writing tasks was 2.61 for the experimental group, and for the control group it was 3.25. Posttest item scores for this attitude toward general writing tasks averaged .14 higher for the experimental group and .26 higher for the control group, indicating an increase in positive attitude toward general writing tasks for both groups (Table 5). There was not a significant difference between the groups.

Table 5. One-way ANOVA for the differences in attitude toward general writing tasks

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Questionnaires	1	12.5000	12.5000	1.3087	.2583
Within Groups	48	458.4800	9.5517		

Use of the writing process

The overall average score for the experimental group was 3.73, and for the control group it was 3.50. The posttest item scores for the attitude toward use of the writing process averaged .20 higher for the experimental group and .33 lower for the control group, indicating an increase in positive attitude for the

experimental group and a decrease for the control group. Results of the analysis (Table 6) indicated a significant difference between the pretest and posttest administrations of the questionnaire.

Table 6. One-way ANOVA for the difference in attitude toward use of the writing process

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Questionnaires	1	76.8800	76.8800	5.8132	.0198*
Within Groups	48	634.8000	13.2250		

* $p < .05$

Frequency of revisions

The overall average score for the experimental group was 3.63, and for the control group it was 3.66. Item scores on the posttest for the attitude toward frequency of revisions averaged I.06 higher for the experimental group and .12 lower for the control group, indicating an increase in positive attitude toward frequency of revisions for the experimental group and a decrease in positive attitude for the control group. Table 7 indicates that there was a significant difference between the pretest and posttest administrations of the questionnaire for the scale toward frequency of revisions.

Table 7. One-way ANOVA for the differences in attitude toward the frequency of revisions in the writing process

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Questionnaires	1	15.6800	15.6800	4.9051	.0316*
Within Groups	48	153.4400	3.1967		

* $p < .05$

Quality of revisions

The overall average item score for the attitude toward the quality of revisions for the experimental group was 3.95, and for the control group it was 3.91. Posttest item scores for the attitude toward quality of revisions (Table 8)

Table 8. One-way ANOVA for the differences in attitude toward quality of revisions in the writing process

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Questionnaires	1	.9800	.9800	.1318	.7181
Within Groups	48	356.8000	7.4333		

averaged .16 lower for the experimental group and .18 lower for the control group, indicating a decrease in positive attitudes toward quality of revisions for both groups, but not a significant difference between them.

Revising with a computer word processor

The overall average item score for the experimental group on the scale for attitude toward revising with a computer word processor was 3.28 for the experimental group and 2.92 for the control group. The experimental group averaged .36 higher on the posttest while the control group averaged .36 lower on the posttest, indicating a significant difference (Table 9).

Table 9. One-way ANOVA for the differences in attitude toward revising with a computer word processor

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Questionnaires	1	98.0000	98.0000	11.2773	.0015*
Within Groups	48	417.1200	8.6900		

* $p < .05$

Revising with a pencil/pen and paper

The overall average item score for the attitude toward revising with a pencil/pen and paper was 3.20 for the experimental group and 3.35 for the control group. Item scores on the posttest for this attitude toward revising with a pencil/pen and paper averaged .04 lower for the experimental group and .06 higher for the control group, indicating a decrease for the experimental and an increase for the control group, but not a significant difference in attitude toward revising with a pencil/pen and paper (Table 10).

Table 10. One-way ANOVA for the differences in attitude toward revising with a pencil/pen and paper

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Questionnaires	1	2.0000	2.0000	.6064	.4400
Within Groups	48	158.3200	3.2983		

Peer group evaluation effectiveness on revision

The overall average item score for the attitude toward peer group evaluation effectiveness on revision was 3.03 for the experimental group and 2.70 for the control group. Table 11 indicates that there was not a significant difference in attitude toward peer group evaluation effectiveness on revision.

The posttest item scores for the experimental (word processor) group were .07 higher while they were .23 higher for the control (pencil/pen and paper) group, reflecting an increase in positive attitudes for this item.

Table 11. One-way ANOVA for the differences in attitude toward peer group evaluation effectiveness on revision

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Questionnaires	1	13.5200	13.5200	1.1680	.2852
Within Groups	48	555.6000	11.5750		

Teacher response effectiveness on revision

The overall average item score for the attitude toward teacher response effectiveness on revision was 2.68 for the experimental group and 3.35 for the control group. Average scores on the posttest for the experimental group were .10 lower and for the control group .10 higher, indicating that there was not a significant difference between the groups in attitude toward teacher response effectiveness on revision (Table 12).

Table 12. One-way ANOVA for the differences in attitude toward teacher response effectiveness on revision

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Questionnaires	1	8.8200	8.8200	1.9805	.1658
Within Groups	48	213.7600	4.4533		

Revision stage of the writing process

The overall average item score for the attitude toward the revision stage of the writing process was 3.56 for the experimental group and 3.72 for the control group. Results of the one-way ANOVA (Table 13) indicate that there was not a significant difference between item scores on the posttest for the positive attitude toward the revision stage of the writing process. The posttest scores from the experimental group averaged .27 higher while the control group's mean scores were .06 higher, indicating an increase in positive attitude in both groups toward this item.

Auxiliary Findings

Informal interview findings

Informal interviews were conducted with the 25 eighth grade students in both the experimental and control groups. The researcher used the same ten

Table 13. One-way ANOVA for the differences in attitude toward the revision stage of the writing process

Source	Degrees of Freedom	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Questionnaires	1	2.8800	2.8800	.3336	.5663
Within Groups	48	414.4000	8.6333		

open-ended questions in discussing revision in the writing process with all of the students.

The most interesting reaction was related to the number of students who favored writing using the computer word processor. Eighty-eight percent of the students in the experimental or computer word processor group preferred writing with the word processor while only 48% of the students who had completed the thirteen day study using pencil/pen and paper indicated they would like to compose using a computer.

Relevant to their perceptions of ways that revision improved their writing, 64% of the word processing writing group felt that revision led to clearer/easier to understand written expression while only 40% of the pencil/pen and paper group responded similarly. In this latter group, 36% of the students offered the idea that revision provides a chance to correct mistakes, but only 12% of the

computer writing class felt that correcting mistakes was an important part of revision. Twenty-four percent of both groups said revision helps a writer realize what he/she said.

Attitudinally, 41.7% of students in the computer word processing (experimental) group thought writing after reviewing/revising was fun, and another 41.7% indicated that they liked using the computer. Yet another 16.7% knew that their writing was improved by revising, a factor noted by 40% of the eighth graders who used pencil/pen and paper for their writing assignments. Twenty percent of the latter group felt that writing seemed easier after reviewing revision in the writing process, and 28% more of this group felt more confident and liked writing more after the two week workshop experience. Twelve percent of the pencil/pen and paper writers expressed the idea that they still didn't like writing, but none of the computer assisted group responded negatively.

Replicating other research studies, 56% of the computer word processing writers indicated that peer response/evaluation was useful in the revision stage while only 24% of the pencil/pen and paper group responded favorably to peer response (Hawisher, 1986). Instead, 36% of this group preferred teacher response while only 12% of the computer writers felt the need for teacher response. In regard to revision as rereading/reseeing, 32% of computer assisted writers and 40% of pencil/pen and paper composition students valued rereading as a revision component.

From peer evaluation, 68% of the computer assisted writers felt pleased and encouraged to improve while a larger 84% of the pencil/pen and paper group responded positively to peer assistance. Contrary to the previous useful revision stategies response, 16% of the computer (experimental) class and 12% of the pencil/pen and paper (control) group said that they liked teacher response better. In the former group, 16% of the students were surprised they liked peer evaluation while only 4% of the more traditional pencil/pen and paper students expressed similar feelings.

Preferred publication audiences differed per group. The majority of the students in both groups favored sharing their writing with their peers/friends (44% of the word processing writers and 52% of the pencil/pen and paper class). Forty percent of the computer-assisted composers preferred national magazines as publication possibilities while only 20% of the pencil/pen and paper class considered such real world audiences. Eight percent of the eighth graders in both classes indicated that they did not want to publish their writing elsewhere.

Finally, 32% of the pencil/pen and paper writers said that they write better than they previously thought now while only 20% of the computer class expressed this idea. In both groups, 20% of the students said they like writing and that it was fun, and another 16% in each group felt that they had improved in self-expression. A surprising 24% in the computer assisted class and 16% in the pencil/pen and paper class indicated that they wanted to work more on prewriting because they still felt that they did not have a lot to write about.

Additional findings

A video taped version of one thirteen-year-old girl's composing at the keyboard style of thinking/writing yielded interesting observations during the two-week study. She, like many other middle school students, is an extroverted, sensing type of learner (Lawrence, 1982). She volunteered to be video taped and directed her abundant energy into interacting with tangible reality. She learns best by doing, with considering, reading, and writing to follow. The following summary items describe her revision strategies:

1. rereads and edits as she progresses in the writing process.
2. revises within sentences one-handed.
3. reviews/rereads/significantly adds to discovery draft.
4. begins composing at the keyboard while directions are being given.
5. uses prompted writing to guide organization of her essay.
6. visits with neighbor to help him understand assignment.
7. rereads/reviews /substitutes words within sentences.
8. uses Appleworks options commands successfully.
9. self-talks quietly as she composes, progressing more quickly.
10. expresses doubt about using printer correctly/asks teacher for help.
11. rereads hard copy.
12. proofreads/edits/prints another draft.
13. shows another student how to print copy.

14. articulates ideas quickly and easily (excellent keyboarding skills).

15. deletes first draft and begins again!

Researchers who employ computer technology to record students' writing divide writers into two groups: "Beethovians," those who discover what they want to say as they write, and "Mozartians," those who plan rather thoroughly before attempting a draft (Bridwell, 1985). Generally Mozartians report that word processors facilitate their writing while Beethovians feel frustrated by having to scroll back and forth to see what they have written. In the observations made of the 13-year-old volunteer, the researcher noted that she qualified as a Beethovian style writer as she progressed through the writing process with self-discovery of content. She edited as she created a first draft, discovered new insights, and revised again, looping back and forth through a recursive writing process.

Summary

The subjects were first pre-tested on their attitudes toward writing with computers and the revision stage of the writing process using a questionnaire developed by the researcher. At the end of the two weeks, the students completed a posttest using the attitude questionnaire. The results of the attitude survey indicated the students' attitude in the experimental group was highly positive toward using computers while in the control (pencil/pen and paper) writing group, the attitude toward writing with a computer was negative.

Other statistically significant differences related to the higher positive attitude toward use of the writing process for the experimental group and a negative attitude toward the writing process for the control group. Also recorded by the findings of the attitude questionnaire was a statistically significant higher positive attitude toward frequency of revisions within the writing process for the experimental group and a slightly negative attitude toward this aspect of the writing process for the control group.

The subjects in both experimental (computer word processing) and control (pencil/ pen and paper) groups were given two expository writing assignments. The research questions examined the difference in the quality of the written text as well as the types of revisions, edits, and the number of total changes made by individual writers in both groups. Although the experimental group made a greater number of total changes, revisions, and edits than did the control group, significant differences between the groups were noted only for the percentage of total changes and revisions. There was not a statistically significant difference between the computer word processing group and the pencil/pen and paper group's holistic scores or edits.

Auxiliary findings in the form of informal interviews supported the attitude questionnaire results. Over twice as many students in the experimental (computer word processing) writing class indicated that they preferred writing with a computer word processor compared with the control (pencil/pen and paper) group.

The majority of students in the experimental group expressed the idea that writing was fun, that they liked using the computer, and that they felt more confident and liked writing more after the two-week writing. Conversely, while the control group knew that their writing was improved by revision, a small percentage of this group responded that they still did not like writing. No one in the experimental (computer word processing) group expressed a negative interest toward enjoyment after writing the posttest.

Also notable in the recorded responses to open ended interview questions was the large percentage of students in the experimental group who indicated an interest in publishing their writing in national periodicals. Half as many students in the control group considered such real world audiences.

Over half the respondents in the experimental group found peer evaluation effective as it influenced revision in writing while fewer than half as many in the control group valued peer reactions/feedback. Teacher response was preferred by a higher percentage of students in the control group.

A video tape of one eighth grade girl's writing process recorded the recursive (looping back and forth) writing model noted by researchers as an advantage of computer assisted writing. Self-talk and rereading/reseeing/ revising as she progressed through the compositions revealed the occurrence of higher level thinking usually associated only with experienced writers. This student demonstrated that, at the eighth grade level, she made many global and surface changes while composing the text.

CHAPTER V. SUMMARY, DISCUSSION, RECOMMENDATIONS AND CONCLUSIONS

Summary

Revision is a recursive step in the writing process that offers a way of seeing one's writing from a new perspective or re-seeing it. It may be repeated as many times as needed to produce a text worth editing. Revision may change the meaning of text to correct faulty or weak content; add or substitute text to clarify meaning; delete, rearrange, distribute or consolidate to give new meaning or emphasis to the text. Revision in writing is a continual process that helps writers discover what they have to say and then reconsider and restructure clearly for an intended audience. Research in the area of revision as a part of the writing process has shown that computers empower young writers to improve the precision and productivity of their expressed thoughts.

Concerned educators emphasize the importance of keyboarding and word processing instructions with sufficient time to practice to maintain the skill level before students are expected to compose using a word processor. Researchers also suggest that the use of each new word processing program be taught prior to writing tasks. Researchers agree that students who use word processors for revision in writing tasks display a more positive attitude toward writing and toward using computers, make two-thirds more revisions, collaborate and respond to peer feedback more freely and easily, and are motivated to more higher level thinking types of revisions than their pencil/pen and paper counterparts.

However, research does not support the hypothesis that students automatically revise more successfully when using word processors. The teacher holds a powerful responsibility to provide a workshop environment in which students feel safe interacting with their peers and assuming increased responsibility for their own learning through writing. Researchers suggest that particularly at the middle school level, the computer word processor may combine with peer response in a writing workshop setting to facilitate growth in refining writing skills in eighth graders so that they may mature as writers through the four years of high school yet to come. Currently little research has focused on the writing ability of middle school (grades 6–8) students.

The purpose of this study was to compare the effect of computer assisted word processing instruction on frequency and quality of revision in eighth graders' expository writing. Data were collected regarding the quantity of changes, revisions, and edits students made during the revising and editing stages of writing as well as the quality of the final written product. Also measured were students' attitudes toward revising with or without the computer as well as their attitudes toward general writing tasks, use of the revision stage of the writing process, frequency and quality of revisions, and peer/teacher evaluation effectiveness on revision.

Two classrooms, each with 25 eighth grade students from Anson Middle School in Marshalltown, Iowa, participated in this study. The study lasted two weeks and included a pre and posttest attitude questionnaire as well as two

(personal narrative and persuasive essay) expository writing assignments. The twenty-five students in the experimental (computer word processing) group composed individually at the keyboard/monitor of Apple gs unnetworked computers using AppleWorks word processing program in the school's computer lab. In the control group, 25 eighth graders individually completed the same two expository writing assignments using pencil/pen and paper. Printouts were collected of the computer word processor students' first and final drafts for each writing assignment in order to tally changes, revisions, and edits. Hand written first and final drafts of the same assignments were collected in the pencil/ pen and paper group. The final written pieces were holistically scored on a scale from one to four by independent graders. Results were analyzed using the SPSSX procedures for a paired t-test and a one-way analysis of variance test. The alpha level was set at .05.

This study was designed to measure how computer assisted word processing instruction affected the number of changes, revisions, and edits students made in their written essays as well as the quality of the written pieces. Using subjects who had received keyboarding instruction in sixth grade and who had previously learned to use the FredWriter word processing program was important to eliminate variables such as computer anxiety and lack of familiarity with the computer keyboard and word processing. Each student in the experimental group received instruction in using the AppleWorks word processing program on the first day of the study.

Summary of the Results

Research question one stated that there would be a difference in the average percentage of changes made during the revising stage of the writing process when students wrote using a word processor compared with students writing with pencil/pen and paper. Results of the t-test indicated that there was a significant difference between the mean percentage of total revisions made by the experimental group (9.10%) and the control group (5.14%).

Research question two dealt with the average percentage of global or structural revisions made during the revising stage of the writing process for both computer word processing and pencil/pen and paper writing groups. The percentage of revisions made by the word processing (experimental) group was 3.45%. The pencil/pen and paper (control) group averaged only 1.22% meaning-changing revisions, and results of the t-tests on this data showed a significant difference in the percentage of global or structural (meaning-changing) revisions made.

Research question three asked if there would be a difference in the average percentage of surface or editing changes made by the experimental (word processor) and control (pencil/pen and paper) groups. The experimental group averaged 5.65% edits while the control group averaged 3.91%. The t-test results indicated that there was not a significant difference in the number of edits made by the two groups.

Research question four was designed to determine if there would be a difference in quality of the final written products between the experimental and control groups. The mean score (2.88) for the computer word processing (experimental) group was slightly higher than the mean score (2.78) for the pencil/pen and paper (control) group. However, the results of the t-test on this data did not show a significant difference in the holistic scores of the final drafts.

Research question five asked if there would be changes in the nine attitude constructs toward revising using a word processor or using a pencil/pen and paper. Results of the analysis of variance tests performed on nine attitude factors indicated a significant difference in only three items. Students in the computer word processing (experimental) group showed an increase in positive attitudes toward the use of the writing process, frequency of revisions, and revising with a computer word processor.

Discussion of the Results

Researchers have shown that re-reading (doubling back again and again on what has been written) is part of the process that advances writers forward (Selfe, 1985; Murray, 1985). Revision using word processors is interpreted as advantageous by some researchers as students perceive themselves as risk-takers and make two-thirds more revision (Sommers, 1980; Humes, 1983; Collier, 1983; and Becker, 1984). Similarly, this study showed a significant increase in the number of total changes made in the revision stage of the writing process.

For the experimental (computer word processing) group, the average number of changes produced during the revision stage was 9.10%, while the average number of changes for the control (pencil/pen and paper) group was 5.14%. The difference between the two averages indicated an increase of 3.96% changes for the experimental group from first to final drafts, suggesting that the computer word processor facilitates a greater number of total changes for the group writing with computers. This increase was significant.

According to Collier and Kane, inexperienced writers generally limit their revision changes to superficial, mechanical alterations unless directed by a teacher to make more sophisticated changes (1983). Results from this study suggest that teacher/peer response did facilitate a greater number of revisions for the experimental (computer word processor) group. Average revisions for the experimental group were higher (3.45%) than for the control group (1.22%). The difference between the two averages indicated a significant increase for the computer word processing group (2.23%).

While previous research concentrated on older writers, this middle school study suggests that eighth graders change text by editing to increase technical proficiency in final drafts using the computer just as other inexperienced writers do (Duling, 1985; Daiute, 1986; and Woodruff, 1986). Results from this study indicate that the average percent of edits for the experimental (computer word processor) group was 5.65% or 1.74% higher than for the control (pencil/pen and paper) group (3.91%). This increase was not statistically significant.

Results of this study suggest that a supportive peer group and teacher response in the process writing workshop do influence eighth graders to increase significantly the number of revisions made using a computer word processor. While the average number of revisions for the experimental group exceeded that of the control group and did appear to be statistically significant, it still represents only a small percentage of the entire text. Apparently, eighth grade students need more than a supportive peer group and teacher instruction/demonstration to dramatically increase their revision and editing capabilities.

Especially for middle school students, peer group influence and peer conferencing contribute positively to learning outcomes in writing (Pascarella & Pflarem, 1980; Fitzgerald, 1987). Other research suggests that what 11–13-year olds do to revise their writing does not increase the quality of their final products (Kurth, 1987). Although this study found that students achieved slightly better holistic writing scores when writing at the computer, this improvement in the writing score was not significant. Students averaged a score of 2.88 on their computer word processing assignments, with 4.00 representing the highest score and 1.00 representing the lowest score, while 2.78 was the average score for the pencil/pen and paper writing assignments. The difference in average scores of .10 was not significant.

The lack of a significant difference in the writing scores between the computer word processing assignments and the pencil/pen and paper assignments might be the result of a narrow grading scale. Students'

assignments were graded on a four-point scale. A broader scale might have allowed for finer distinctions among student writers' pieces, which then might have allowed more room for a significant difference between computer word processing writing and pencil/pen and paper products.

Researchers have shown that students who write with a computer word processor display a more positive attitude toward writing than those with little or no exposure to computers (Dauite, 1982; Johnson &Sterkel, 1984; Kurth, 1987). For middle school students, this positive attitude relates particularly to the drafting and revising stages of the writing process (Tyler Eastman, 1989). Findings from this study support the research on student attitudes for some of the facets of the writing process but not for others.

One of the previous findings replicated in this study suggests that students who use computer word processors in the study show significantly more positive attitudes toward the use of the writing process. Mean item scores on the scale for attitude toward the use of the writing process were 3.63 on the pretest for the experimental group and 3.83 on the posttest, representing a significant increase in positive attitude toward the use of the writing process. Mean scores for the control group decreased from the mean item score of 3.66 on the pretest to 3.34 on the posttest, indicating a decrease in positive attitude for the pencil/ pen and paper writing group.

Similarly, mean item scores on the scale for attitude toward frequency of revisions in the writing process increased significantly for the computer word

processor group as the pretest item mean was 3.1 and the posttest item mean was 4.16. The control (pencil/pen and paper) group's pretest item mean was 3.72 while their posttest mean decreased to 3.60.

Another significant difference for the experimental (computer word processor) group was reflected in the more positive attitude toward revising with a computer word processor. Mean item scores for the experimental group on the pretest were 3.11, and on the posttest the mean item scores increased to 3.46. For the control group the mean item scores on the pretest were 3.10, but on the posttest they decreased to 2.74. This difference might relate in part to the business-like attitude adopted by the computer word processing class. Their work habits clearly illustrated that they realized they had limited time to use the computers, and they set to work immediately upon entering the room each day. They frequently commented about the ease of revision facilitated by the word processors.

For the factors of general writing tasks, the average item scores for both groups decreased slightly, but the decrease was not significant. One reason for this decrease might be the general wording of the items: I enjoy classroom writing assignments; I write outside of class for my own personal enjoyment; and I believe that writing is a way of thinking.

The already high positive score on the attitude toward quality of revisions (4.08 on the pretest for the experimental group and a mean item score of 4.00 for the control group) may explain the slight decrease in positive attitude toward this facet of the writing process. The posttest item scores averaged 3.92 for the

experimental group and 3.82 for the control group. Another factor that might further explain this decrease was that many students felt rushed to complete final revisions on the second assignment, and that might have influenced their responses. There was not a significant difference in this attitude scale.

For the factors relating to revising with pencil/pen and paper, the experimental group showed a slight decrease from the average item response of 3.22 on the pretest to 3.18 on the posttest while the control group showed an increase from a mean item score of 3.32 on the pretest to 3.38 on the posttest. The decrease in the computer word processor (experimental) group's average item scores might be attributed to their easy access to the computer word processor during class time. The slight increase in the control (pencil/pen and paper) group's average item responses might be the result of their practice of this method of revising. For this attitude factor there was not a significant difference.

Item response scores for the attitude toward peer evaluation effectiveness on revision increased for both groups, and it was high from the beginning. The experimental group's average item response on the pretest for this attitude was 3.00, and the control (pencil/pen and paper) group's average item score was 2.58. Both groups increased in positive attitude toward peer evaluation effectiveness on revision with the experimental group's posttest mean item response of 3.07 and the control group's posttest mean item response of 2.81. The lack of a significant difference in the positive attitude toward peer evaluation might be because of the already high positive attitude.

Of special interest to the researcher/teacher was the decrease in positive attitude toward teacher response effectiveness on revision shown by the experimental (computer word processing) group. Their average item response on the pretest was 3.23, with a posttest item score of 3.12. Conversely, the control (pencil/pen and paper) group increased in positive attitude toward teacher response effectiveness on revision from an average item score of 3.29 on the pretest and an average item score of 3.40 on the posttest. This decrease in positive attitude toward teacher response effectiveness on revision might be a result of the empowering quality of the computer as it enables the student to make additions, deletions, consolidations, etc. more easily and, therefore, frees him/her to grow toward independent higher level thinking. The increase in positive attitude toward teacher response effectiveness on revision in the pencil/pen and paper group might have resulted because of the interaction of the teacher/writer in the interactive writing workshop in the regular classroom. Again, no significant difference was found in this attitude item perhaps due to the narrow nature of the attitude responses on the Likert-type scale.

A final attitude factor that did not change significantly over the two-week course of the study was the attitude toward the revision stage of the writing process. Differences between the pretest and posttest indicated a slight increase in positive attitude toward the revision stage of the writing process although this increase was not significant.

One possible explanation for this lack of significant increase in positive attitude toward the revision stage of the writing process might be that two weeks, the length of time of the study, was too short a time for the students to realize the capacity for revision that the computer provided. Some students found the AppleWorks options difficult to recall. As cited previously, researchers have found that students need to be taught word processor skills with sufficient time to practice in order to maintain the skill level (Wetzel, 1980).

Discussion of the Additional Findings

Although the study was only two-weeks long, informal interviews with the participants in both the experimental (computer word processor) group and the control (pencil/pen and paper) group reinforce the significant differences found in three areas. Eighty-eight percent of the students in the experimental group that used computer word processors favored writing using a computer while only 48% of the pencil/pen and paper writers indicated this preference. The easy access to the computers during class time as well as the ease of making revisions and edits using the AppleWorks word processing program might be the reason for the higher percentage of students who preferred to compose with computers in the experimental group. The pencil/pen and paper group might have shown a decrease in preference to use the computer because they were aware that the computer lab was open to other classes only during the class period when the experimental group met.

Sixty-four percent of the experimental group felt that revision led to clearer/easier to understand written expression while only 40% of the pencil/pen and paper (control) group expressed this response. In this latter group, 36% of the students said that they felt revision provided a chance to correct mistakes while only 12% of the computer class expressed this editing feature to be important. Twenty-four percent of both groups related that revision helps a writer realize what he/she said. One of the reasons that the computer word processor (experimental) group might have indicated a higher percentage of positive attitude toward revision as a catalyst for change toward clearer/easier to understand writing might be the ease with which they made global revisions using AppleWorks options. Observations made during the two–week time period showed that they enjoyed using the new features as they were explained and modeled by the researcher and student teacher in the compuer lab. Another reason for their preference toward making global revisions instead of lower level editing changes might be that the latter type of changes were simple to make as the students learned to use spell checkers automatically. In the peer evaluation groups, the control (pencil/pen and paper) writers showed difficulty in identifying global changes that would improve the text while they focused on mechanical or grammatical errors quickly.

Attitudinally, 41.7% of the computer assisted writing group expressed the idea that writing after reviewing/revising was fun, and another 41.7% of that group indicated they liked using the computer. While some of that attitude might

be attributed to the novelty effect, the pencil/pen and paper writers did not spontaneously indicate that they thought writing was fun at any stage of the writing process. This attitude might be a result of the time consuming process of literally cutting and pasting and of rewriting successive drafts of their essays using pencil/pen and paper. This latter group expressed a more serious attitude toward changes in the writing, indicating that they thought writing seemed easier after reviewing revision (20%), and another 28% said that they felt more confident and liked writing more after the two-week workshop. This change in positive attitude might be the result of positive outcomes in their own writing that occurred because of using the revision strategies learned and practiced in class during the two-week period of the study.

A favorable response to peer evaluation effectiveness on revision (56% of the computer word processor class) from the experimental group might have been due to the ease of peer conferencing in the computer lab as students worked in pairs in their peer evaluation groups. Students sometimes printed hard copies using the available printers, but more frequently they simply moved to read each other's monitors. The pencil/pen and paper writers worked in triad groups, and only 24% responded favorably to peer response. One of the factors influencing this attitude in the control group might have been that their class experienced difficulty in articulating specific constructive criticism. The researcher spent some time teaching the process of responding specifically to the rubrics

established for the two assignments. Students in the computer word processing class approached their revisions as necessary aspects of polishing their writing. Their work habits improved as the study progressed, and they sought peer response to their writing and used the word processor to write recommendations for revisions as they evaluated each other's writing.

Although the attitude questionnaire mean item scores did not reflect a significant difference in students' positive attitudes toward peer group evaluation effectiveness on revision in their informal interviews, a large percentage (84%) of the pencil/pen and paper writers felt pleased and encouraged to improve because of peer response. A smaller 68% of the experimental (computer word processor) group expressed this reaction. Part of the reason for this interview response following the study might be that the pencil/pen and paper writers spent more time working together in their triads than did the computer assisted writers. Therefore, only 4% of the pencil/pen and paper writers expressed surprise that they liked peer evaluation group work. They used cooperative learning groups more frequently and were accustomed to interacting with their peers in reading and writing activities more frequently than the computer word processor class. This might explain why a larger 16% of the experimental group said that they were surprised they liked peer evaluation.

One additional finding that complemented the peer evaluation approval factor was the audience preference for publishing their writing for both groups. Forty-four percent of the word processing writers favored sharing their writing

with their friends while 52% of the pencil/pen and paper writers wanted to publish their writing for peers. Again the climate established in the writing workshop in the regular classroom might account for the larger percent of pencil/pen and paper writers who indicated that their audience preference was a group of their peers. Forty-four percent of the word processing writers preferred to publish their writing for an audience of their peers, and another 40% considered national periodicals as publication audiences while only 20% of the pencil/pen and paper writers considered publication in the print media. One explanation for this interest in publication for real world audiences might be found in the professional appearance of the final draft produced with the computer word processor. Students in this group demonstrated pride in the appearance of their finished products as well as in the overall content. Another informal observation might explain the increase in the computer word processor group's interest in publication in outside the school markets. One student's letter to the editor (an adaptation of his second writing assignment) was published during the course of the two week study. Other students who noticed this at-risk student's success might have been encouraged to follow his example in working toward publication outside the middle school. Other students in this computer assisted writing class also published adaptations of their persuasive essays (second assignments) as editorials in the school newspaper.

Qualitative findings provided further support for the use of the computer word processor in the writing process. During the study one thirteen-year-old

girl volunteered to be video taped so that her style of thinking/writng could be observed. Her writing reflected the recursive, looping back and forth composition style that indicates that the writer discovers meaning and works through a reflexive mode (Elbow, 1981; Emig, 1971). This video tape yielded similar research findings as those found in Jensen and DiTiberio's 1989 anthology, Personality and the Teaching of Writing. She did, however, appear to follow the more sophisticated composition style of experienced writers as she reread and reviewed her writing in chunks as she progressed. She restructured and reshaped her writing as researchers have found experienced writers to do (Sommers, 1980). This observation might be explained as a a part of her personality type, or it might suggest that inexperienced writers employ more sophisticated writing and revising strategies than those previously attributed to them.

Another qualitative finding relates to the frequency with which this computer assisted volunteer subject interacted with peers near her and with the teacher/ researcher. She was energetic and learned by doing as she also taught others who had questions about the computer word processor or about the writing assignments. She was also quick to ask for reassurance and help. These traits might be attributed to her personality or perhaps to the classroom climate wherein students felt comfortable working cooperatively to help each other through the writing process.

At the end of the informal interviews, 24% of the computer assisted writers indicated that they wanted to work more on prewriting because they

still felt that they did not have many experiences about which to write. Sixteen percent of the pencil/pen writers responded similarly. This indicates a need to encourage brainstorming, clustering, and freewriting as methods of inculcating creativity prior to writing a discovery draft.

Recommendations for Further Study

Results of this study indicated that further research is needed in the use of computer word processors as they impact revision in the writing process.

The first recommendation is to lengthen the time of the study. Both this study with eighth-grade students and that of Ruth J. Kurth with tenth-grade students found a significant increase in the percentage of revisions and total changes that students made from first to final drafts of their writing using a word processor. Kurth's study encompassed twelve weeks of work, however. An extension would provide time for the researcher to follow students' progress for a longer time period and to measure whether the revisions continue to increase significantly. This extension would also allow students time to become more familiar with the word processing program and with the concept of peer conferencing within the computer assisted writing workshop.

Another reason for extending the study would be to continue to measure student attitudes toward revision in the writing process and toward the use of the computer in writing. This study and those of Colette Daiute, Damion Curtiss, and Ruth J. Kurth agree that students enjoy writing with the computer more than their

classmates who work with traditional writing tools. Extending the length of time of the study would enable the researcher to monitor the significant differences found by all of these researchers relevant to the increase in students' positive attitudes toward revising with a computer word processor, frequency of revisions, and the use of the writing process.

Gail E. Hawisher, in her review of research literature related to computers and the writing process, found that most research has been conducted for less than a semester or academic year, which may not be long enough to document measurable differences in growth in writing (1989). While this study showed .10 higher mean holistic scores for the computer assisted writers' final drafts, there was not a significant difference shown. Woodruff and his colleagues examined final drafts of enriched and average eighth graders and found that for each group that composed at computers, the students' final drafts were judged more technically proficient than first drafts (1985). This research combined with the current study would indicate the need for an extended time period of perhaps two or more school years to measure students' writing products with a careful distinction between global revisions that change meaning and edits which simply contribute to the technical proficiency of final drafts. Woodruff and his colleagues and this study suggest a need to examine the effect of the computer on the writing of low ability students as well (1985). This study included four learning disabled students in the computer word processing (experimental) class and only two in the pencil/pen and paper (control) class.

A second recommendation is to carry out a study of the effect of peer interaction/conferencing on individual computer written products. There is some preliminary evidence that suggests that students collaborate to a greater extent when word processing is introduced into writing classes (Kurth, 1987). Positive attitudes toward peer evaluation conferences in both the computer and traditional writing classrooms suggest the need to document the support for the strong feeling of improved writing ability that often accompanies positive attitudes. Peer conferencing when combined with use of the computer word processor might lead to increased revisions and edits as well as higher quality writing.

The third recommendation for further study relates to the informal observations made of one eighth grade student composing at the computer. This study and that of Selfe and Wahlstrom suggest that word processing tends to motivate students, and in so doing, creates an ecology in which students and teachers share information and learning (1986). This finding suggests a need for a study of teaching strategies that capitalize on computers and social interactions in the computer writing workshop. The current research and that of George Hillocks, Jr. suggest that the teacher as learner/writer model might lead to a new conceptualizaton of writing instruction (1986).

The fourth recommendation is to carry out a study in which the effects of the computer on the collaborative writing of eighth graders is monitored. While Dale Greer and G. Gayle Allen have found significant improvements in writing

scores from the first collaborative computer written assignment to the second in sixth graders and in college juniors and seniors, only Ruth J. Kurth's study suggests that eighth graders collaborate with one another to a greater extent when word processing is introduced into the process writing classroom.

A fifth recommendation is to carry out a study that frames computer assisted writing instruction in terms of real communication. Dawn Rodrigues and Raymond J. Rodrigues suggest (as does the current study) that computers empower students to higher level thinking as it relates to issues that are important to them. Computer-based lessons might be compared in a study which leads students to use the computer to gather and store information, to juxtapose one idea for another, to try out an idea with a peer, and to relate information for a real audience context.

One final recommendation is to study the effects of computer assisted word processing instruction on the quality of writing of entire classes of students of comparable age and ability levels in similar sized schools. To complete this task would require increased access to and availability of computers within schools.

Conclusions

Research results suggest that computer word processing programs enhance the teaching of written composition. Few researchers, however, have studied the effect of computer word processing on the writing improvement of middle school students in a process writing environment.

This study investigated the effect of computer assisted word processing instruction on frequency and quality of revisions in eighth graders' expository writing. Using the computer as a tool to facilitate changes, the experimental group wrote two essay assignments while the control group wrote the same two assignments in the regular classroom. In both settings the focus was on teaching specific global revision strategies that contributed to changing and clarifying meaning in the text. The potential of the computer to facilitate changes (both revisions and edits) was explored.

The results of this study indicated that the word processor is perceived by students who have opportunity to use it in a process writing workshop as a powerful tool to use in the revision process. Additionally, the use of the computer favorably increased the number of global revisions made by the computer word processing group when compared with the traditional pencil/pen and paper writing group. There was also an indication that students in the word processor group accurately perceived themselves as making more revisions.

Computer word processing as a writing tool frees students from tedious recopying and empowers them to higher level thinking. It offers opportunities for real world publication to young people who previously may not have perceived themselves as writers. Subsequently it heightens the inexperienced writer's self-esteem. Writing using word processors not only increases the frequency of revisions and edits, but also assists students in improving the quality of their finished products. Additional empirical evidence is needed to

support the infusion of computer assisted word processing in language arts classrooms in middle schools especially. By thinking/learning through the writing process and using computer word processors, teachers and students discover together the benefits of collaboration and cooperation in writing for extended audiences.

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I would like to thank all those who have encouraged me to carry out my research study and to complete my thesis. These supportive people have provided a variety of types of assistance.

First, I want to thank Dr. Ann Thompson for her encouragement in working with an experimental study involving middle school students. Her high expectations and expertise in curriculum and instructional technology have inspired me not only in this study, but also in the application of practical teaching strategies that incorporate computer learning in the middle school language arts curriculum.

I am also grateful to the Anson Middle School eighth graders in Marshalltown, Iowa, for their cooperation as I conducted my research study. I especially want to thank Dr. Fred Wills, the principal, for supporting this research and for his interest in using this study to increase the use of computers across the writing curriculum. I am also grateful to Tim Fienup for being supportive of the language arts class using his computer lab and to Angela Caspersen, my student teacher, for demonstrating AppleWorks options and for assisting students.

I would like to express my appreciation to Carol Roush and Kevin Whitver, experienced middle school writing instructors, for holistically scoring the writing samples for this study. Also, I would like to thank Dr. John Cook for his help with computer programs.

I appreciate the contributions of Dr. Michael Simonson and Dr. Donald Payne

as they have served on my program of study committee. Their ideas and recommendations have enlarged and enhanced this research.

Finally, I want to thank my husband, Gary Yocum, and my daughters, Cindy and Mary Kay, who always showed encouragement and patience as I worked through the research process.

APPENDIX A: ATTITUDE SURVEY

EIGHTH GRADE WRITING SURVEY

Student Number _____ Age _____ Sex _____ Date _____

Please indicate your agreement or disagreement with each statement by selecting the appropriate number. Indicate each choice on the answer sheet provided.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

1. I enjoy classroom writing assignments.
2. I write outside of class for my own personal enjoyment.
3. I believe that writing is a way of thinking.
4. I use the writing process (prewriting, writing, revising, proofreading/editing, and publishing) when I write.
5. I write a paper more than once before considering it completed.
6. When I revise my writing, I improve spelling, punctuation, capitalization, etc.
7. When I revise my writing, I change words and phrases within sentences.
8. When I revise my writing, I move around or reorganize sentences and/or paragraphs.
9. I revise my writing by rereading, reviewing, and rewriting as I progress through the writing process.
10. I revise my writing on my own without a teacher reminder.
11. I feel that a conference with a teacher helps me revise my writing.
12. Instead of a conference with the teacher, I prefer a teacher's written comments regarding revision possibilities.
13. I usually seek help from my peers when I revise my writing.

14. I usually seek help from a teacher when I revise my writing.

15. I would prefer to share my writing assignments with 3-4 other eighth graders in peer evaluation groups.

16. I enjoy sharing my writing with a large group of 25-30 classmates as a means of evaluating my writing.

17. I don't think eighth grade students have enough understanding of the revision portion of the writing process to help each other revise their writing successfully.

18. I feel that revising my writing improves it so that it becomes clearer and more understandable to the reader.

19. I like having other people read my writing.

20. I feel that revision is a necessary step toward publishing my writing for readers in this school or outside in the community.

21. I define *revision* as changing meaning in the content of my writing.

22. I define *revision* as correcting mechanical errors such as spelling, punctuation, and sentence structure.

23. I feel that *revision* consists of both changing meaning in the content of my writing and correcting mechanical errors.

24. Using a computer word processor such as FredWriter or AppleWorks increases the number of times I revise my writing.

25. I think that computers make writing more difficult.

26. I think that computers make writing in the classroom more enjoyable.

27. I think that computer word processing is an easy way to make revisions.

28. I would prefer to write using a computer word processor if it is available.

29. I am not confident enough of my computer knowledge to write with a computer word processor without teacher direction and /or assistance.

30. I feel that I do my best writing using pen/pencil and paper.

APPENDIX B: POST-STUDY, AUDIO TAPED, INFORMAL INTERVIEW QUESTIONS

1. What does revision mean to you?

2. Please describe your own method of revising your writing.

3. Which of the revision strategies introduced during the past twelve days have you found most useful?

4. In what ways do you feel that revising improves your writing?

5. Given a choice of writing with a pen/pencil and paper or with a computer word processor, why would you select one over the other?

6. Explain your feelings about writing after having reviewed the writing process in the workshop setting.

7. Discuss your reactions to peer responses/comments about your writing.

8. What audiences do you now recognize as possible publication outlets for your writing?

9. What was the most important thing you learned about yourself as a writer during the workshop experience?

10. What would you improve about the way writing is taught in eighth grade language arts?

APPENDIX C: HUMAN SUBJECTS FORM AND LETTERS TO INSTITUTION, PARENTS, AND STUDENTS

Last Name of Principal Investigator Yocum

Checklist for Attachments and Time Schedule

The following are attached (please check):

12. ☒ Letter or written statement to subjects indicating clearly:
    a) purpose of the research
    b) the use of any identifier codes (names, #'s), how they will be used, and when they will be removed (see Item 17)
    c) an estimate of time needed for participation in the research and the place
    d) if applicable, location of the research activity
    e) how you will ensure confidentiality
    f) in a longitudinal study, note when and how you will contact subjects later
    g) participation is voluntary; nonparticipation will not affect evaluations of the subject

13. ☒ Consent form (if applicable)

14. ☐ Letter of approval for research from cooperating organizations or institutions (if applicable)

15. ☒ Data-gathering instruments Pre- and post-test questionnaire is attached. Students' first and final drafts of two essays will also be used relevant to frequency and quality of revision.

16. Anticipated dates for contact with subjects:

First Contact	Last Contact
9/16/91	9/30/91
Month / Day / Year	Month / Day / Year

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

10/15/91
Month / Day / Year

18. Signature of Departmental Executive Officer | Date | Department or Administrative Unit

1-30-91 Curr & Inst.

19. Decision of the University Human Subjects Review Committee:

☒ Project Approved ☐ Project Not Approved ☐ No Action Required

Patricia M. Keith — Name of Committee Chairperson
2/8/91 — Date
Signature of Committee Chairperson

Letter Seeking Approval from Institution

622 Garland Drive
Marshalltown, Iowa 50158
July 26, 1991

Dr. Fred A. Wills
Anson Middle School
South Third Ave.
Marshalltown, Iowa 50158

Dear Dr. Wills:

In an effort to substantiate the need for computers to be used in writing across the middle school curriculum, I have designed a quasi-experimental study to determine the effect of computer assisted word processing instruction on the frequency and quality of revision in eighth graders' expository writing. While this research is being conducted as a part of the requirement for the Master of Science degree in Curriculum and Instructional Technology at Iowa State University, I feel that it is particularly timely as the Anson Middle School staff prepares to infuse computer/technology usage across the disciplines.

The K-12 Language Arts Department of the Marshalltown Community School District has long endorsed process writing instruction and has recently implemented a holistic writing assessment plan for grades 3, 5, 7, 9, and 11. One of the age groups about which little is known is the 13-year-old (eighth grade) group. This study will yield valuable information about these students' attitudes toward writing as well as their ability to make revisions. Similarly, it will serve to indicate the effectiveness of the computer as a tool that enhances higher level thinking through writing.

Attached are copies of the consent letters which will be sent to parents and students involved in the study. Thank you very much for your prompt response in approving this research.

Sincerely,

Lois J. Yocum

Letter of Approval from Institution

Anson Middle School
Marshalltown Community School District

Dr. Fred A. Wills
Principal

South Third Avenue
Marshalltown, IA 50158
(515) 752-3641

Mary Beth Brockmeyer
Associate Principal

July 30, 1991

Mrs. Lois Yocum
622 Garland Dr.
Marshalltown, IA 50158

Dear Mrs. Yocum,

I have read with much interest the proposal that you have submitted to my office in relation to the frequency and quality of computer assisted word processing for 8th grade students. I would agree that your study not only merits approval; but is also very timely. Please consider this letter as administrative permission for the study within the bounds of parent permission as addressed in your request.

As a condition of the approval, I would like a copy of the final study and your permission to use that study for program advancement or modification at Anson Middle School.

If there is any way that I can be of farther assistance to your study please don't hesitate to ask.

Fred A. Wills
Principal

September 6, 1991

Dear Parent/Guardian of Eighth Grade Student,

As a part of the language arts curriculum at Anson Middle School, students work through the following steps of the writing process: prewriting, drafting, revising, proofreading, and publishing. In an effort to assess students' progress in revision techniques, a sampling of eighth grade writing will be examined to determine the effect of computer assisted word processing instruction on frequency and quality of revisions in expository writing. The three types of revisions that will be reviewed are: spelling and punctuation (proofreading and editing); words and phrases (changing and ordering); and sentences and/or paragraphs (changing and reorganizing).

In the next two weeks, each student will complete a survey regarding frequency and quality of revision before and after receiving process writing instruction using either computer assisted word processing instruction or pen/ pencil and paper. Please sign below if you would or would not like your students' data to be included in the survey results. If you have questions about this study, please contact Lois Yocum, eighth grade language arts teacher, at the number listed below.

(student's name)

YES, I give permission for _____'s data to be used for the study. I understand that no personal data records will be kept, only group results, and all data will be destroyed when the group surveys are calculated.

Signature of Parent/Guardian _____

(student's name)

NO, I do not give permission for _____'s data to be used in the study.

Signature of Parent/Guardian _____

Thank you for promptly returning this permission form.

Sincerely,

Lois Yocum (Teacher/ISU Graduate Student) 752-3641

Dr. Ann Thompson (ISU Major Professor) 294-5287

September 6, 1991

Dear Anson Middle School Eighth Grade Student,

You have been selected to be a part of a study of the frequency and quality of revision in writing a personal narrative and a persuasive essay. The purpose of this research is to discover how often 13-14-year-olds revise their writing as well as to reveal the types of revisions students make. The three revision strategies that will be measured include: (1) reorganizing or moving sentences or paragraphs; (2) changing and reordering words and phrases within sentences; and (3) improving spelling and punctuation.

For a two week time period you will be a part of either an experimental or a control group of students. The experimental group will write two essays using the Apple gs computers and Appleworks word processing program in the computer lab while the control group will use pencil/pen and paper in the regular classroom. A writing workshop classroom format will allow time for the writing process, peer and teacher conferencing, and sharing the writing. You will not be required to share your writing by reading it aloud unless you wish to do so.

To ensure confidentiality, you will be assigned a student number with which you should identify each draft of the two essays you write. At the end of the two weeks, the number and types of revisions made between first and final drafts will be counted and analyzed.

You will also be asked to complete a survey indicating your attitudes and experiences in writing before and after the research is conducted. Please sign below to indicate your consent to be a part of this research project. Thank you for your cooperation and active participation.

Sincerely,

Mrs. Lois Yocum

I agree to participate in the Iowa State University research writing project described above. I understand that no personal data records will be kept, only group results, and all data will be destroyed when the group surveys are calculated.

Signature of Student Participant _____

APPENDIX D: PROFESSIONAL APPRAISAL REQUEST FORM

Please comment on the validity of the attached questionnaire as a measure of eighth grade students' attitudes toward the following: (a) general writing tasks, (b) use of the writing process, (c) frequency of revisions, (d) quality of revisions, (e) revising with a computer word processor, (f) revising with pen/pencil and paper, (g) peer evaluation group effectiveness toward revision, and (h) teacher conferencing effectiveness toward revision.

If there are items which appear to be irrelevant to the above objectives of the study, please write their numbers in the space below. Also indicate ideas you may have which you feel should be added to reflect students' attitudes toward frequency and quality of revision in a process writing workshop classroom format.

_____

_____

If there are any statements which you feel are inappropriate because of complexity, ambiguity, etc. for an eighth grader to read and understand, indicate by circling the numbers of items you find to be problematic on the student questionnaire.

Thank you for judging this attitude survey and for returning it promptly.

Lois Yocum
Anson Middle School
South Third Avenue
Marshalltown, IA 50158

APPENDIX E: DETAILED PROCEDURES FOR DAILY WRITING ASSIGNMENTS

Expository writing assignment one: personal narrative

Day 1. (Monday, September 16)

(in the regular classroom for both experimental and control groups)

* The researcher explains the purpose of the study and answers questions the eighth graders may have (15 min.).
* The researcher distributes the questionnaire and explains the importance of honest, thoughtful, and accurate individual responses. Students complete the questionnaire and return it to the class collection basket (20 min.).
* The researcher explains the format for the writing workshop in the regular classroom and in the computer lab (10 min.).

Day 2. (Tuesday, September 17)

(in the computer lab)

* The researcher distributes AppleWorks start up and program disks and also a data disk per student (5 min.).
* The researcher demonstrates how to boot the AppleWorks disks (5 min.).
* Using the LCD screen and overhead projector, the researcher demonstrates how to access the AppleWorks word processor component, how to create a file, how to access and use the options, and how to save to data disk (10 min.)
* Students practice the process demonstrated and name a file *Journal* and freewrite their first journal entry. (25 min.) Students will use the journal to keep a log of their writing progress, but also as a storehouse for writing ideas.

(in the regular classroom)

* The researcher explains the interactive writing workshop classroom model: (1) mini-lesson--journal writing explanation (10 min.); (2) status-of-the class conference (10 min.); (3) write/confer--teacher writes and conferences (20 min.); group share (5 min.) (Atwell, 1987).

Day 3. (Wednesday, September 18)

(in the computer lab)

* Using the computer, LCD screen, and overhead projector, the researcher models the writing process by introducing the personal narrative assignment topic: an autobiographical anecdote (10 min.) (D. Rodrigues, 1986).
* Students brainstorm generalizations about a fictitious, group-invented eighth grader and create together by answering prompted writing discussion questions which supply specific details for an anecdote.

The researcher types in the students' ideas (10 min.).

* Students produce a group discovery draft together
  The researcher types in their dictation (20 min.).
* The researcher reviews prewriting and brainstorming as they will be used in tomorrow's writing (5 min.).

(in the regular classroom)

* Using the overhead projector, the researcher introduces the personal narrative assignment: an autobiographical anecdote mini-lesson (10 min.).
* Students brainstorm generalizations about a fictitious eighth grader, and the researcher writes them on the overhead transparency or blackboard (10 min.).
* On large newsprint sheets of paper, the students produce a discovery draft together (20 min.).
* Workshop group share time--students discuss applications of today's work to their own for tomorrow (5 min.).

Day 4, (Thursday, September 19)

(in the computer lab)

* The researcher defines *first draft* and *anecdote* (10 min.).
* The researcher demonstrates the COPY command so that students may copy any prewriting responses to rough drafts (5 min.).
* Students brainstorm individually at their computers generalizations about themselves which can be supported or illustrated with an anecdote (10 min.).
* Students compare brainstormed lists (5 min.).
* Students answer prompted writing questions and begin to compose first drafts at the computer (15 min.).

(in the regular classroom)

* The researcher reviews the writing process and defines *first draft* and *anecdote* (10 min.).
* Students brainstorm individually, using pencil/pen and paper (5 min.).
* Students compare brainstormed lists (5 min.).
* Students answer applicable prewriting questions which appear on a blackboard (5 min.).
* Students begin to compose a first draft, using pencil/pen and paper (20 min.).
* Group share time: students discuss effectiveness of questions in prewriting (5 min.).

Day 5, (Friday, September 20)

(in the computer lab)

* The researcher answers questions relevant to first drafts and encourages students to complete these discovery drafts and to progress to practice recursive revision (10 min.).
* Students compose/revise at the keyboard (25 min.).
* Students work with revision partners to review/revise their writing (10 min.).

(in the regular classroom)

* The researcher answers questions about first drafts and encourages students to practice get the ideas onto the page without thinking about spelling and punctuation correctness (10 min.).
* Students compose the first draft using pencil/pen and paper (20 min.).
* Students work together in partners to review and revise main ideas and organization (10 min.).
* Group share time: students discuss their revision habits and read from their first drafts (5 min.).

Day 6. (Monday, September 23)

(in the computer lab)

* The researcher defines revision as a way of re-seeing a first draft from a new perspective, and students discuss their previous day's revisions (10 min.).
* Using the group first draft, the researcher models ways that students suggest reorganizing or moving sentences or paragraphs using the CUT, COPY, PASTE commands in the word processing program (10 min.).
* The researcher asks students what words and phrases within sentences they would like to change and demonstrates DELETE and MOVE commands (10 min.).
* Students work with partners to read for meaning and idea changes (5 min.).
* Students work to revise their first drafts, using the concepts for revision presented in the prompted writing checklist (10 min.).

(in the regular classroom)

* The researcher teaches a mini-lesson on revision as a way of re-seeing and explains recursive procedures (5 min.).
* Using the group first draft composed on large newsprint sheets, the researcher draws arrows and circles to relocate ideas and literally cuts and pastes as students suggest (10 min.).
* The researcher asks a student to use the above materials to change words and phrases to modify the group first draft (10 min.).
* Students work with partners to read for meaning and idea changes in first drafts (10 min.).

* Students revise their writing, using the strategies taught through teacher modeling (10 min.).

Day 7, (Tuesday, September 24)
(in the computer lab)
* The researcher explains that spelling and punctuation are minimal revision strategies that often fall into the category of proofreading and editing (5 min.).
* Students use proofreading prompted questions to help them check mechanical errors in their writing (10 min.)
* Students revise content and organization of their autobiographical anecdote essays and move to each other's computers for peer evaluation (30 min.).

(in the regular classroom)
* The researcher explains the minimal revision strategies cited above (5 min.).
* Students proofread and edit their pencil/pen and paper essays and use a proofreading wall chart checklist to remind them of spelling, punctuation, and usage corrections (10 min.).
* Students make corrections and undergo peer evaluation of their autobiographical anecdote essays (25 min.)
* Group share time: discuss correction types (5 min.).

Day 8, (Wednesday, September 25)
(in the computer lab)
* Students move to other computers to help each other polish their essays (10 min.).
* Students make final changes to compositions (10 min.).
* Students print their essays (15 min.).
* Volunteers read their essays aloud (10 min.).

(in the regular classroom)
* Students reread and secure peer response to nearly polished writings (10 min.).
* Students recopy their essays in ink on notebook paper (15 min.).
* Students read their essays aloud (20 min.).

Expository writing assignment two: persuasive essay

Day 9, Thursday, September 26)(in the computer lab)
* Using the computer, LCD screen, and overhead project, the researcher introduces and defines the persuasive essay. She asks, "What problems need solving? Who might have solutions?"

This is to encourage students to understand the possibilities for persuasive writing to change their worlds (5 min.).

* Students brainstorm a list of levels of problems: international, national, state, local, and personal [matches regular Issues and Answers discussion held every Monday in this language arts class] (10 min.).
* Students move around the room using the partner system to conduct a topic conference and set goals for the persuasive essay (10 min.).
* Having decided with their peers on a topic, students compose the beginning of the persuasive essay at their computers (10 min.).

(in the regular classroom)

* Using a blackboard to explain the persuasive essay, the researcher refers to the essay recommending changes in the postal system which students read as homework (5 min.).
* The researcher discusses with students ways that persuasive writing affects them in everyday life (5 min.)
* Students work in four person clusters to brainstorm a list of the levels of problems cited above (10 min.).
* Students report per group on the levels of problems and post their lists on the bulletin board (10 min).
* Students select topics of interest and write discovery drafts of the persuasive essay (15 min.).

Day 10. (Friday, September 27)

(in the computer lab)

* The researcher asks students to consider audiences for their persuasive essays (5 min.).
* Students discuss in terms of subject, audience, and their persuasive purpose what the publication possibilities are for the writing they began yesterday (10 min.).
* The researcher defines an argumentative proposition for the essay's first paragraph (5 min.).
* Students work in groups of three at their various computers to secure feedback on the aurgmentative proposition in the thesis sentence of each other's writing (10 min.).
* Students review opening paragraphs, revise, and compose at the keyboard to include two or three major points and a personal experience to suppport the persuasive argument (20 min.).

(in the regular classroom)

* The researcher presents the mini-lesson relevant to subject, audience, and purpose (10 min.).
* Students discuss possible audiences for persuasive essays (10 min.).
* The researcher defines an argumentative proposition and its

relationship to the purpose of the essay (5 min.).

* In small groups the students read aloud their first paragraphs from yesterday and revise by rewriting to clarify meaning (15 min.).
* Students discuss three major points and a personal experience that may support the thesis sentence in the essay (5 min.).

Day 11. (Monday, September 30)

(in the computer lab)

* The researcher asks students to consider the best location in the essay for the solution to the problem. She demonstrates the MOVE command so that students may experiment with moving text (10 min.).
* Students reread and review their writing in pairs and progress to compose the conclusion of their essays at the keyboard (20 min.).
* Students revise to add, delete, substitute and move around text, and some move to other computers to read and comment (10 min.).
* The researcher asks students to indicate the types of revisions made during this class period. She records their responses (5 min.).

(in the regular classroom)

* The researcher asks the pencil/pen and paper writers where they will locate their solutions to problems in their essays. Discussion follows (5 min.).
* The researcher uses scissors and tape to cut and paste the solution to her own essay's problem in different locations. She explains that students may draw arrows or otherwise indicate moving text (10 min.).
* Students reread and review their writing and progress to finish writing (20 min.).
* Group share: read/respond to solutions (10 min.).

Day 12. (Tuesday, October 1)

(in the computer lab)

* Students proofread and edit their writing and ask two other students to provide feedback (15 min.).
* Students make final corrections to drafts (10 min.).
* Students print final drafts (10 min.).
* Students discuss actual publication of an anthology of their persuasive essays (10 min.).

(in the regular classroom)

* Students proofread and edit their writing in peer evaluation groups (15 min.).
* Students make final corrections and recopy their final drafts (20 min.).
* Group share time: discuss possible audiences for publication and prepare to publish an anthology of hand written persuasive essays (10 min.).

Day 13. (Wednesday, September 30)

(in the regular classroom for both groups)

* The researcher explains the need to complete the survey for the second time (5 min.).
* The researcher distributes the questionnaire and emphasizes the importance of students answering the questions honestly as they relate to their twelve day experience in the study (20 min.).
* The researcher thanks the students and explains that the results of the study will be published in the parent newsletter in the spring (5 min.)
* Student volunteers read their essays (15 min.).

Day 14. (Thursday, October 1)

(in the conference room for individuals in both groups)

* The researcher interviews and audio tapes conversations with individual students using the post-study, informal interview questions found in Appendix B.
* The student teacher begins teaching a two week short story unit.

APPENDIX F: PEER CONFERENCING REVISION CHECKLIST

Use this list to guide your responses/comments to the ideas expressed in your group members' discovery drafts. Remember to work only with content and clear expression of ideas, not proofreading/editing corrections.

1. Purpose:
   Is it clear what the writer is trying to do? Is he or she trying to explain how something works, share an autobiographical anecdote, or persuade the reader to take action?

2. Voice:
   Does the writing sound honest and sincere? Does the writer sound interested in his or her writing?

3. Audience:
   Will the readers enjoy or appreciate the subject of this writing? Are all of the readers' questions answered?

4. Content:
   Does the writer know his or her subject? Has the writer included enough chunks of information to interest readers?

5. Form:
   Are the ideas presented clearly and logically, so a reader can easily more from one point to the next?

6. Writing Devices:
   Does the writing include any personal thoughts or stories, specific detail, dialogue, or creative comparisons (metaphors, similes, etc.)?

7. Purpose Again:
   Does the writing make a person smile, pound his or her fist, or react in some other way? What is especially good about the writing?

APPENDIX G: ROLE OF THE TEACHER IN FACILITATING REVISION

The teacher of revision in a process writing workshop environment works as a collaborator-coach-partner. Four basic types of conferences enable students to grow to independence in revising their writing.

A. Large Group Conferences

* introduce new revision skills, such as additions, deletions, substitutions, rearrangements, distributions, and consolidations that change meaning or emphasis in the writing.
* model for students specific mini-lessons.
* involve students in solving problems, such as reordering or rearranging ideas for clearer meaning by changing, moving, adding, or deleting them.
* focus the whole class's attention on one student's writing.

B. Roving Conferences

* bring teacher and student together to answer such questions as: Which idea matters most to you? What feeling do you want your reader to have?
* serve to keep the writing going as the teacher and student reflect on an experience by talking about it for several minutes.

C. Peer Conferences

* require that students listen carefully to help others find meaning in writing.
* allow teacher opportunity to monitor and adjust to students' level of understanding.
* free teacher to actively participate as group member/writer/reviser.
* provide immediate feedback.
* increase revising and editing.
* encourage enterprise and accomplishment.

D. Individual Revising Conferences With Teacher

* focus on one thing at a time.
* direct attention to content and order.
* postpone editing until later.
* encourage students to ask questions.
* expand toward additions to text.

APPENDIX H: THE WRITING PROCESS PROMPTED WRITING ON INDIVIDUAL STUDENT DISKS

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AN AUTOBIOGRAPHICAL ANECDOTE
(corresponds with writing assignment one)

1. In this assignment, you will write about yourself in a way that should interest a reader. Everyone has something worth telling others, but he/she sometimes has trouble deciding exactly what to say. One technique is to write a generalization and support it with an anecdote.

Before you begin, you might want to preview the entire lesson. To do so, simply press the PAGE DOWN key and read the lesson. You may, however, simply begin without reading the entire lesson. If so,

PLEASE MOVE TO THE NEXT FRAME.

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2. An anecdote is basically a little story that serves to prove a point. For example, if you wanted to prove how clumsy you were, you might write about the time you walked into your kitchen and broke three dishes within a minute, how your parent reacted, and why that proves your point.

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3. First, think of three generalizations you could make about yourself. Perhaps you might write about how you get nervous before tests or the fact that you are the luckiest person in school or something else that sets you apart from other people. Write your three generalizations below:

a.
b.
c.

Now, which of those generalizations can you support or illustrate with the best story about yourself?

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4. Briefly, tell what happened:

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5. Now use the following questions to help you think through your anecdote or story before you begin to write your first full draft. ANSWER ONLY THOSE QUESTIONS THAT SEEM USEFUL TO YOU. ANSWER THEM IN ANY ORDER

THAT YOU WANT.
Who will read it? What do you think that reader wants to read?
Why does that anecdote prove your generalization?
Why did that event happen?
Were there any other people involved? How? Who?
How did the other people react to what you did?
Do you think you could do that again? Why?
Do you want to do that again? Why?

Now, read over your answers to the prewriting questions above. Begin writing your rough draft in the space below. Remember, you can easily copy any of your prewriting responses to your own rough draft by using the copy command of your word processor.
ROUGH DRAFT:

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6. REVIEWING YOUR WRITING

1. What could you add to your essay?
2. What could you omit?
3. Would any part of what you have written so far be clearer to the reader if it were placed in another position? If so, move it there using the move feature of your word processor.

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7. REVISING SENTENCES

1. Check your sentence beginnings. Did you start several sentences with the same word? If you did, change a few of these sentences now.
2. Find two short, consecutive sentences. Can these be connected to form a longer, better-written sentence? Rewrite these sentences now.
3. Can you add any connecting words such as *but*, *because*, *when*, or *however*? Look for ways to help the reader understand what you have written.

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8. Would this story be more memorable if your generalization were at the end? If so, move it there and make it fit better.

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9. PROOFREADING: (1) Check all your punctuation. (Have you joined any sentences with a comma instead of a period? Do you need commas after any subordinate clauses?) Make necessary changes now. (2) Check your spelling.

Perhaps have a friend read what you wrote to look for misspelled words.
(3) Make sure you don't have any usage errors. (Have you written *alot* instead of *a lot*? Do your subjects agree with your verbs?) Make any corrections now.

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10. Now, go back to your story and read it one more time. If you want to make any more changes, do so. Then return to this frame.

PRESS PAGE DOWN TO CONTINUE, PAGE UP TO REVIEW.

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11. HAVE YOU SAVED YOUR STORY? Don't turn the machine off.
SAVE your autobiography with anecdote now.

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(D. Rodrigues & R. J. Rodrigues, 1986).

APPENDIX I: ADDITIONAL RUBRICS FOR ASSIGNMENTS ONE AND TWO OF THIS STUDY AND HOLISTIC RUBRICS FOR EIGHTH GRADE WRITING EVALUATION ADAPTED FROM THE MARSHALLTOWN COMMUNITY SCHOOLS' HOLISTIC RUBRICS FOR SEVENTH GRADE WRITING EVALUATION

Additional Rubrics for Assignment One: Personal Narrative with Autobiographical Anecdote

The student will:

1. include a generalization.
2. support the generalization with an autobiographical anecdote.
3. use the anecdote to make a point.
4. use the anecdote to prove the generalization.

Additional Rubrics for Assignment Two: Persuasive Essay

The student will:

1. convince his/her reader to agree with him/her.
2. appeal to reason in the reader.
3. include a thesis or purpose statement in the first paragraph.
4. return to the thesis statement at the end of the essay.

For a ranking of 1–2, the student will include 1–2 of the above items in his/her writing.

For a ranking of 3–4, the student will include 3–4 of the above items in his/her writing.

HOLISTIC RUBRICS FOR SEVENTH GRADE WRITING EVALUATION
MARSHALLTOWN COMMUNITY SCHOOL DISTRICT
MAY, 1991

Holistic scoring differs from primary trait scoring in that its focus is on the essence or overall impression of a piece of writing rather than on individual traits or skills into which the writing can be broken down. When scoring holistically, a reader does only one reading, not looking back over the writing or focusing on any individual traits while reading. As soon as the piece of writing is read, it is ranked. Our ranking system is 1, 2, 3, and 4 (one is poorly written, four is well written). Two readers individually rank each piece, then add together their rankings so that a total score for a piece of writing can be from 1 to 8.

In our first year of assessing writing, the following rubrics were developed for the seventh grade end of year assessment. An overall reading will encompass idea development (content and creativity); organization (sentence and paragraph structure); grammar, usage and mechanics; and word choice (vocabulary).

RATING I
--shows unclear organization.
--uses basic language.
--grammar, usage and mechanics interfere with readability.
--practices limited word choice and vocabulary usage.

RATING II
--implements use of introduction, body, and conclusion.
--expresses literal and denotative language.
--grammar, usage, and mechanics limit comprehension of content.
--demonstrates appropriate word choice and vocabulary usage.

RATING III
--evidences average clarity of development.
--attempts connotative language meanings.
--exhibits above average correctness of grammar, usage, and mechanics.
--implements selective word choice and vocabulary usage.

RATING IV

--displays memorable coherence and unity.
--experiments with figurative language.
--shows correct usage of grammar and mechanics.
--exhibits expansive word choice and vocabulary usage.

APPENDIX J: EXAMPLE ESSAYS FOR ASSIGNMENTS ONE AND TWO
adapted from McCuen, J. & Winkler, A. (1986). Readings for Writers.
Chicago, Illinois: Harcourt Brace Jovanovich

Assignment One Example: Ant Kingdoms

One day when I was eleven, I remember calmly sitting on top of a large dirt hill in a vacant lot in my neighborhood, but that wasn't important. The heat of the day was important. It was summertime, incredibly hot, and I was dying of thirst.

From where I sat, everything appeared to be brown except for the sky which was pale blue and without clouds. The dirt hill itself was composed of light brown, powdery, dry earth. There was no scent connected with the dirt hill but an occasional windborne essence of wild sage and sumac bushes.

As I began to investigate my dirt hill more closely, I discovered a little ant hill near my left foot. I had never really examined an ant hill before, so I scooted myself nearer to it.

My first observation was that the ants were in perpetual motion, and I was fascinated by their ambitious movement. The ants seemed to have a passion for hard work, and all were involved in some activity. Some built tunnels, some climbed hills, and every individual ant seemed to be doing something constructive for the society. After close inspection for about three minutes or hours, I was greatly impressed with their work and decided to study them with care. "Here," it occurred to me, "is an ant kingdom."

Before I came across this ant kingdom, I had held a poor opinion of ants. I regarded them as selfish, stupid creatures. If they weren't falling into half-full jars of honey or discarded bottles of pop, they could be found swarming over half-eaten apples and dirty fragments of candy bars. They had struck me as useless, disgusting insects.

But now I realized that there were some ants who worked together to build and maintain an orderly ant kingdom in a dirt hill on a vacant lot. I was quite pleased with myself for seeing this different side of ants. Although I did not fully understand my new relationship with ants, I knew that I had met up with something awesome and purposeful in the insect kingdom. So I immersed myself in the pleasant scrutiny of this treasure.

I shifted from my sitting position and got down on my hands and knees. I wanted a closer look, so I lowered my right eye and subjected the ants to the most grueling of inspections. I observed some ants carrying huge boulders, pinched in between their mighty jaws, for miles and miles. They carried them from one end of the ant kingdom to the other, dropped them, and returned for more. Some other ants speedily ran about, from one ant to another to yet another, stopping to rub antennae, and then scurrying off in no particular direction.

Suddenly, the scene brought me an earlier memory: I remembered watching my father as he was working on some wood furniture. He was using an electric sander which scraped and vibrated the veneer off the wood. The fine, powdery sawdust, which was the product of this sanding process, fluidly danced on the tabletop as my father continued his work. This, I thought, was what the ant kingdom now looked like: nothing more significant than the discarded shavings of a carpenter's tools.

I felt deceived and stupid for fantasizing about ants and their kingdoms as if they were anything more than mere, insignificant insects. The ants oozed from the ant holes...millions of ants...all over the dirt hill. It was a scene of frenzy and panic. Ants crawled and scurried over the hill as far as the eye could see; ants exploded in purposeless commotion, scrounging aroud for crumbs, decaying vegetable and animal matter; ants danced and swayed to a mysterious, inaudible rhythm of their own.

Somehow, I felt angry with their random, purposeless scurrying. I wanted to put an end to this stupid burst of ant activity. It then occurred to me that I could put an end to it. At first, I was shocked and frightened by this idea, but I continued to explore its possibilities.

I realized that I, a kid dying of thirst on a hot summer day, could--on a whim--crush the ant kingdom with my feet and scatter it all over the hill just by grinding my heels into the dirt. I could disrupt and destroy millions of frenzied, hyperactive lives. On the other hand, I could leave the ants alone.

I felt immediately guilty for having thought about destroying the ants, but more than that, I was amazed that I had a choice in this matter. I was in control and could destroy or preserve millions of tiny living creatures. I could act out of my affection, pity, hatred, or lack of something to do.

Dazed by this sudden sense of responsibility, I walked away from the hill to quench my thirst, leaving behind millions of ants to live out their lives in peace. I felt as if I had just made an important moral choice.

Assignment Two Example: The Ineffective Postal Service

The next time someone sends you a package or letter, you might not receive it; and if you do receive it, the sender paid too much money for postage. Also, the package will probably arrive later than it should. Because the present postal service is too expensive and inefficient, private couriers should be given the United States postal service business.

The U. S. postal service is very poorly managed. As the television news program Sixty Minutes recently explained, "Postal employees are still sorting the mail the same way Benjamin Franklin originally designed--by hand, stuffing each piece into one of many different pigeonholes." In the bulk mail sorting centers,

the mail is sorted in order to be sent to the post office nearest its final destination. Once it has arrived at that post office, it is sorted again to be handed to the correct postman, and it is then delivered by him to the appropriate neighborhood block. Unfortunately, this repeated sorting requires great amounts of manpower. It takes 667,000 people to sort and deliver the more than one hundred billion pieces of mail that go through the United States postal service annually.

The system could be modernized dramatically, but the federal government is so slow to change that nothing will be done for decades. For instance, if these mail sorting processes were computerized, the number of those thousands of employees could be cut back. The delivery time on the mail would be shortened, and the costs of handling would be decreased. But such a dramatic change could be accomplished only if the postal service were a private industry. It would even be possible to have two or three separate postal services, along with other private couriers, all in competition with each other. That way the postal employees that were laid off by the government could band together to incorporate another postal service to create even more competition. After all, competition has always improved business.

The U. S. postal service also mismanages its money. Millions of dollars are spent on unreasonable payroll raises and benefits. The postal service seems to be unconscious of any cause-effect relationship between performance and pay. Even the most bumbling worker is paid a good wage, and no one is ever fired. The three major postal workers' unions have pushed until the average salary for a worker is $22,000 per year in wages and benefits, plus a cost-of-living adjustment every six months. William F. Bolger, the U. S. Postmaster General, in discussing studies done by the postal service, states, "The employees have been paid much more than workers holding comparable jobs in private industries and have contributed little to the agency's recent productivity gains." Bolger also says, "Every two weeks their payroll is over five hundred million dollars." Today, the post office tax burden is crippling and demoralizing the average taxpayer. In payroll alone, twenty million dollars is spent every two weeks, which is 520 million tax dollars every year, paid by us. Eighty-six percent of every postal dollar goes for workers' salaries.

My personal experience with the postal service has upset me. Once I received an important letter three weeks after the post date. The letter had to travel only 300 miles. Another time a relative of mine mailed me an expensive clock, but upon arrival at my house it was badly damaged, despite the fact that it had been well wrapped.

To stop private couriers from taking business from our inefficient postal service, the U. S. postal service has created for itseslf a monopoly on first-class mail. In 1960, the givernment passed a law called "The Private Express Statute," which prevents private couriers from carrying first-class mail. First-class mail is considered any letter bearing information to a specific person. The law considers "letters" any standard written correspondence, payroll checks, tickets, hunting and

fishing licenses, and many other items. There are a few exceptions to this monopoly. Outside agencies may deliver time-sensitive documents. They can also deliver first-class mail anytime, under any circumstances, provided that first-class postage has been paid to the postal service!

The few smaller private couriers that do exist are much faster and more reliable than the U. S. postal service. Their services are frequently more convenient to the consumer, which lets them charge high rates since they have little or no competition. Most of the private firms offer overnight delivery and guarantee delivery by noon of the next working day. They also offer door-to-door service, which the U. S. postal service does not. The postal service will usually have its express mail to its destination only by the end of the next working day. Private couriers today offer great speed at a high price because they have no competition. The United Parcel Service (U. P. S.) is the exception to the "faster therefore more expensive" rule. Its rates are cheaper than first-class mail, very close in fact to the U. S. postal service's parcel post rate. However, U. P. S. is often faster than first-class mail and offers door-to-door delivery.

It is in everyone's best interest to eliminate the monopoly of mail delivery created by the postal service by giving some of its business to smaller, private couriers that could be in competition with each other, forcing rates down. Such a system would be much better than continuing the large, mismanaged postal service we have now.