EFFECTS OF COMPUTER WORD PROCESSING ON THE CREATIVE WRITING OF COLLEGE COMPOSITION STUDENTS

by

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ABSTRACT

This thesis examines research in computers and creativity, pointing out that few studies exist to tell us how computers affect the creative products of adult writers. The first section of this thesis summarizes the existing research, noting where individual studies may be relevant to the study of creativity in adult writers.

The second and third sections of this thesis describe an in-class writing experiment performed at Youngstown State University during spring semester, 2001. In the experiment, 68 beginning college writers in five "Writing I" classes wrote a narrative on a prompt. Half the students in each class wrote their essays by hand, and half used *Microsoft Word 97*, a popular word processing program. Three judges rated the essays on three creativity-related criteria: *idea*, *word choice*, and *development/organization.*

The ratings, analyzed using an Analysis of Variance (ANOVA), showed a slight, statistically insignificant tendency toward better performance when writers used word processors. Male students showed negligible improvement when using the computer; however, female students scored nearly 10% higher on the computer in both the *idea* and *development/ organization* criteria. Overall, word count increased by over 18% when subjects used the computer.

The final section of the thesis discusses the results of a questionnaire, "Technology in the Classroom," which asked 56 students eight detailed questions about their history with computers, their experience and level of comfort with them, and their experience and satisfaction with research using the Internet. The vast majority of respondents have at least some computer, word processing, and Internet experience, and nearly half claim to have "extensive" experience.

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This thesis is dedicated to the memory of my mother, Jacquelyn Wells, and to my family.

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Section 1:

Toward an Understanding of the Psychology of Creativity in Writers

Without attempting to perform a meta-analysis of the literature on creativity studies to date, this section will cite relevant studies that enable the reader to understand how cognitive psychologists and other experts in the field of creativity approach the creative process and assess its products.

A thorough search of library resources and online publications yields much in the field of creativity research, but surprisingly little of that research is quantitative or experimental. Rather, as Teresa Amabile points out in *The Social Psychology of Creativity*, the major emphasis of recent research has been case studies of creative individuals (4). Although such case studies may give useful insight, they rely on much that is subjective (which is, as we shall see, not entirely negative), and, because they so often study famous and successful creative people, they give little indication of how to account for creativity in the general public—in our elementary and secondary schools, in colleges and universities, and in the working world.

Must we, as educators in English language arts, assume that creativity exists only when the creator becomes rich and famous? Must we tell students that, compared to James Joyce or Langston Hughes, they are just dwarf stars in a vast universe of stellar talents? Or—as this thesis plans to explore—may we tell them, and rightly, that they already possess the tools for creativity? And may we further assert that the tools they choose for expression may affect the products of that expression?

1. Determining creativity

How exactly does one define creativity? Moreover, *should* it be defined? Before we can test subjects for levels of creative thinking, we must determine what constitutes creative thought. However, no consensus exists among psychologists asked to make that determination. Some assert that creativity has a set of identifiable features that can be quantified; some argue that the response of the audience to the product is the best way to determine whether a product is creative. Still others say that there is no way to define creativity (Amabile, *Social* 17). The *act* of creation, as Arthur Koestler reveals in the landmark 1964 book *The Act of Creation*, is "based on essentially the same underlying pattern" whether the domain is science, music, poetry, mathematics, or painting; it is in the judging that distinctions are found, for different criteria are used to assess products of different domains. Creating is, as he points out, "always a leap into the dark, a dive into the deeps, and the diver is more likely to come up with a handful of mud than with a coral" (330). The study presented and discussed later in this thesis focuses on creativity—specifically, linguistic creativity, that which is exhibited by writers of narrative—and how to judge the products of that creativity; indeed, the point is to decide how to tell the "coral" from the "mud."

Thomas Ward, Steven Smith, and Jyotsna Vaid (1997) point to recent studies showing that linguistic creativity in children can develop as early as age seven, when they begin to understand figurative expression, and in particular, idiom (158). The process by which children develop figurative language, they say, lasts from about age seven to age eleven. As children develop the ability to look beyond the obvious "local" meaning of

words to search for a more universal or coherent meaning, they acquire the ability to comprehend and even produce figurative speech on their own (159).

Popular today is a theory that each of us prefers a particular "style" of learning: tactile, visual, or verbal/aural. We learn to rely on these methods as children, and as we grow to adulthood, we excel when we can learn in our preferred method (John-Steiner 11). The most creative individuals develop unique ways of learning that often involve intense immersion in a single subject to the exclusion of all others—a situation that most public schools in the Western world do not allow children to enjoy. Those with linguistic creativity often grow up in environments in which spoken and/or written words rule, and they develop a preference for verbal learning. If these individuals are given the freedom to play with language as adults in the same way they did as children, creative works often result.

Must we define creativity before we can study and assess it? According to Stephen Kosslyn, no: "[I]t is not necessary to begin with a crisp definition of an entity in order to study it. . . . It is hard to define something one knows little about" (qtd. in Amabile, *Social* 17). I will assert further that not having a definition of an entity is the best reason to study it.

In studying creativity, however, another problem of definition emerges: whether to study the *person* or simply the *product*. J. P. Guilford, in 1950, argued that the definition of creativity must come from studying creative *personality*, that behavioral traits are the hallmark of the creative person (qtd. in Amabile 19). But, as Amabile points out, "most explicit definitions have used the creative *product* as the distinguishing sign of creativity" (19). Some theorists go further to claim that creative products fall into one of

four categories: scientific, musical, artistic, or verbal (20). In the next section, I will discuss the currently accepted creativity "tests," many of which focus on creative *personality*, not creative product. I will then show how a subjective method of assessing creative *product*, instead of personality, may be in some ways superior for the assessment of creativity.

2. Measuring creativity

Before devising an improved method for "measuring" creativity, we must look briefly at the previous methods and discuss how they fall short. Creativity tests fall into three categories: personality inventories, biographical inventories, and behavioral assessments.

Personality inventories designed to assess the characteristic traits of creative people include such tests as E. Paul Torrance's "What Kind of Person Are You?" and Harrison G. Gough's Creative Personality Scale for the Adjective Check List. In each, respondents choose adjectives to describe themselves, with some adjectives being defined by the designer of the test as "positively related to creativity" (Amabile, *Social* 21). The trouble with self-report inventories is that creative or highly intelligent persons can easily choose answers that show themselves to be a certain personality type. Also, the test's assessment of an individual's creativity is based upon the test designers' subjective analysis of individuals the *designers* deemed creative. While the subjectivity of the assessment is not, by itself, enough to make this type of test suspect, the combination of subjectivity and the ease with which the test subject can skew the results makes the self-inventory an inappropriate choice for measuring creativity.

Biographical inventories—a second type of creativity test—include such information as "family histories," "educational histories," "leisure activities," "physical characteristics," and the somewhat vague "miscellaneous." The designers of these tests interviewed subjects rated high in creativity and others rated low or average in creativity, and then listed from fifty to several hundred items to which test subjects could be compared (Amabile, *Creativity* 24). The trouble with these tests is that if the subject does

not compare favorably to the subjects used to set up the test (in one case, NASA engineers and scientists whose habits and histories were extensively catalogued), whether the subject produces work that may be considered creative is irrelevant; the test has condemned him or her to a lifelong sentence of ordinariness.

A third, and more common, form of creativity assessment is the behavioral test. Guilford, Torrance, and Michael Wallach and Nathan Kogan have devised popular behavioral inventories to which many schoolchildren have been subjected since the 1950s. Guilford's "Unusual Uses" test, for example, asks the subject to think of as many uses as possible for some common object. Wallach and Kogan's tests comprise five subtests, each of which requires children to respond to a battery of questions—for example, "Name all the things you can think of that make a noise." Finally, the Torrance tests, perhaps the most well known behavioral inventories, place children into groups and test them on such criteria as these: (1) fluency—the production of large numbers of ideas; (2) flexibility—the production of a large variety of ideas; (3) elaboration—the development and embellishment of ideas; and (4) originality—the application of ideas that occur infrequently or are not "obvious" responses (Amabile, *Creativity* 24).

As Amabile asks in *Creativity in Context*, is it appropriate to use these tests to label people as *creative*? She cites William C. Ward (1974), who argues that test scores should be given more precise labels that reflect more accurately the ability or criterion being assessed (25). Also, subsequent studies have questioned the construct validity (essentially, whether a test or study measures what it says it measures) of many tests as well as the convergent validity (the actual agreement between or among ratings, gathered independently of one another, where measures should theoretically be related) of

different test procedures when validated against one another (27). John Dixon (1979) and Dennis Hocevar (1979), in separate studies, found that originality scores on the Torrance Tests of Creative Thinking are greatly dependent upon and influenced by verbal fluency; labeling verbal fluency as "originality" is perhaps deceptive (28). So while Amabile has pointed out some flaws in current methods of creativity assessment, she also asserts that creativity tests and subjective assessments of products *are* useful for creativity research—because they "likely measure particular cognitive styles and skills that are conducive to creativity" (*Creativity* 40).

Attempts have been made to create tests that would assess creative products objectively, as opposed to the subjective methods already discussed. One such attempt was designed by Dean Simonton (1980), who devised a method for quantifying originality of musical themes. Simonton's test compared themes by 479 classical composers and assessed them mathematically to assign an overall originality score. Amabile's argument against using this method to assess creativity is twofold: first, applying this method to other domains, many of which do not easily lend themselves to mathematical description, would be difficult, if not impossible; and more importantly, "this technique cannot distinguish the creative from the merely bizarre" (*Social* 27).

As an alternative to these attempts at "objective assessment"—most of which turn out to be largely subjective anyway—she devised her Consensual Technique for Creativity Assessment. I have structured my own study using some elements of this technique. Part 3 of this section discusses the procedural requirements for using this technique to assess creativity. Part 4 of this section discusses research on word processing and composition. Part 5 outlines relevant research on computers and creativity. And

finally, Part 6 discusses the application of the existing research on word processing and creativity to college-age writers, as an introduction to the study I performed at Youngstown State University during spring semester 2001. In this study, 68 composition students in two experimental conditions—longhand writers and word processor users—created narrative essays. Two qualified judges assessed the essays using three criteria related to creativity, and the resulting scores were analyzed statistically to determine whether word processor use affects creativity in college-age writers.

3. Amabile's Consensual Technique for Creativity Assessment; the role of play in creativity and how computers encourage play

In *The Social Psychology of Creativity*, Teresa Amabile explains that "[n]early all current definitions of creativity are conceptual rather than operational and were not intended to be translated into actual assessment criteria" (30). After extensive study and experimentation, she offers this alternative: the Consensual Technique for Creativity Assessment.

The development and use of this technique require that the researcher understand and agree with some basic assumptions about creative process. For instance, Amabile lists the following components of creative performance: domain-relevant skills such as factual knowledge, technical skills, and special talents; creativity-relevant skills, such as cognitive style, working style, and application of heuristics for the exploration of new cognitive pathways; and task motivation, including variables that determine how the subject approaches the given task. Several features of cognitive style are relevant to creativity: breaking perceptual set (i.e., using objects and items in a way that is different from their intended use); breaking cognitive set (i.e., abandoning familiar algorithms, or ways of solving problems, to search for new solutions); understanding complexities; keeping response options open for as long as possible; suspending judgment; using "wide" categories (i.e., being able to see relationships between apparently unrelated pieces of information); having accurate memory; breaking out of performance "scripts" (i.e., being able to examine the predetermined algorithms for solving problems in a given domain, with the result that the algorithms are questioned and insight gained from that

questioning); and using creative perception (i.e., being able to see things differently from how others see them and being able to "take advantage of serendipity" by recognizing the importance of new information) (*Social* 72).

While the individual who exhibits Amabile's components of creative performance may not always produce work uniformly considered creative, Amabile asserts that knowledge of these components will allow the researcher to make an accurate subjective assessment of the creative product and its producer by employing the following assessment technique.

Using the Consensual Technique for Creativity Assessment requires that the researcher follow these rules:

1. Choose judges solely for their familiarity with the domain in which the subjects are being tested;
2. Judges make independent assessments—not in conference with one another, and not using specific criteria for judging creativity;
3. Judges should assess dimensions other than creativity, such as technical aspects and aesthetic appeal, if possible, so that they can determine whether these dimensions affect levels of creativity. Assessing other dimensions can also help determine whether particular social factors (say, living in a one-parent household) affect creativity much as they affect other dimensions (e.g., technical aspects);
4. Judges rate products relative to one another and not to some list of "master works" in the domain;
5. Each judge should view products in random order and consider the different rating criteria in random order;

6. To determine whether the task given to subjects was appropriate for the purposes of the study, examine the judges' ratings. If a high level of inter-judge reliability exists, if the task presents no technical difficulties to subjects in the study, and if the researcher can show that judged creativity does not increase with the subjects' experience (in my study, for example, experience with computer word processors), then the chosen task is appropriate for the purposes of the study (Amabile, *Creativity* 41–43).

Amabile's theory of creativity (as detailed above) assumes, among other things, that anyone with "normal cognitive abilities" can be creative to some degree; that individuals can exhibit degrees of creativity; that although people differ widely in their potential for creativity, formal education seems essential to the development of the highest levels of creativity; and that creativity often involves an eagerness to work hard and be deeply involved in the project, but it also requires a high level of intrinsic motivation as well as "*intellectual playfulness* and freedom from external constraints" (67; emphasis added).

Amabile is not the only researcher who cites the importance of play in fostering creative process and creative works. Koestler (1964) cites a traditional definition of play as activity removed from "serious aims and ends"—and then asks the obvious question, *what are serious aims and ends?* Those that are not playful? As an alternative to being trapped on this definition treadmill, he suggests we consider play an activity with "a definite 'primary biological function'—viz. to give free rein to the exploratory drive. But such a view can only be held once it is recognized that the exploratory drive itself originates in a 'primary need' equal in importance to the others" (510). He makes a distinction between the exploratory drive used for problem solving (for example, a child

looking for a particular toy in a room) and the exploratory drive used simply for the pleasure of exploring (e.g., a child turned loose in a room full of toys and games, not sure which he really wants and not particularly concerned with any specific goal in his exploration). The child in the first instance may seem to the observer to be "playing," but she is in fact solving a problem—she wants a particular toy, and even if another toy that might be just as much fun to play with appears to her during the search, she will ignore it in pursuit of her goal. Conversely, the child in the second example is open to anything that meets his senses; this is true play, according to Koestler. And it is in true play, intrinsically motivated but with uncertain outcome, that children often come up with their most creative products.

Vera John-Steiner, author of an extensive creativity case study, *Notebooks of the Mind*, seems to agree with Koestler. Children play, she says, at creative pursuits such as drawing and painting in what is akin to "the preverbal rehearsal with sound and tonal variation, which is an essential stage in the acquisition of language" (25). They create art because it is enjoyable to do so. Later, when their emotions become more complex, they tend to give up such "childish" forms of expression in favor of those deemed appropriate by parents, teachers, and others in their culture. A few lucky ones, through either the encouragement of family or the attention of unusually astute teachers, continue to use graphic arts—combining their serious efforts at expression with play-derived visual media. She quotes Ernest Schachtel, who laments that a culture's effort to integrate its youth into the accepted forms of expression "increasingly supplants the child's original approach to the objects, and, especially in our time entails the danger of *closing* his openness toward the world and of reducing all experiences to the perception of . . .

clichés . . ." (qtd. in John-Steiner, 26). John-Steiner's endorsement of play is unequivocal: "New work is born out of the playfulness of the young, and the freshness of perception that does not wilt after childhood" (45). Obviously, then, if we are to encourage creativity, we must allow students to work in the medium of their choice—and perhaps even encourage them to "play" once in a while.

How do computers fit into this "definition" of creativity and the importance of play? Mike Sharples, in *How We Write* (1999), advocates the ability of computers to bring play into creative writing. He discusses the work of Michael Joyce, author and designer of the *Afternoon* hypertext fiction. In this early hypertext, which contained more than 500 episodes and more than 900 internal links, explorers could follow a different part of the story each time they visited—even if they clicked on the same spot during subsequent visits. The creation of Joyce's work required the ability to create fiction, to program computers, and to design the visual space in which the story takes place (194).

Computer games, too, offer the creator and the user numerous opportunities to explore creative avenues. Early games such as *Dungeons and Dragons*, a role-playing game revolving around storytelling, evolved into text-based computer games, e.g., *Colossal Adventure.* Many teachers now create hypertexts of their own for use in the classroom; as Sharples points out, a hypertext he created "played an essential part in the children's development of writing abilities. It gave them a dynamic medium for composing and revising. It also acted as a bridge between descriptive and narrative writing, since the game turned their descriptions into the setting for a journey through [a virtual haunted] house" (195). Modern programs allow multiple players to participate at once, thereby encouraging interactive creativity.

Some software packages, of course, are designed not to encourage the creativity of the user, but to display their *own* creativity (or that of the author)—indeed, to attempt to create what writers create. Margaret Boden discusses such software in *Artificial Intelligence and Natural Man* (1987). One such package, *Tale-Spin* (which, as the name implies, "spins tales"), generates stories by using "planning structures . . . which represent goals and methods of achieving those goals" (311). Somewhat more sophisticated than its predecessors, *Tale-Spin* starts with a character and a problem and then goes about solving that problem. Characters are defined by description on three scales—competition, dominance, and familiarity—and can be introduced at key points to complicate the process of solving the initial problem. Another story generator, called *Ex-Spectre*, uses a simple system of frames (called by the author, C. J. Rieger, "conceptual overlays") to interpret stories. *Ex-Spectre* uses "stereotyped conceptual overlays, together with 'common-sense algorithms' . . . to respond to text in the sort of way required of the reader of a detective story" (311). The trouble with programs is that they rely on algorithms—and if there is one thing most creativity researchers agree on, it is that creative thought occurs *outside* of established algorithms. Even if no idea can be said to originate from "nothing"—in that all problem solving involves the thinker's prior experiences to some extent—certainly an idea that originates from following the same paths of thought that have produced the majority of unoriginal ideas in a given brain will not generally be considered novel or creative. Boden concludes, then, that creativity, "like learning and problem solving, involves the production of new thoughts from old" (298).

If, then, computers cannot *produce* creative ideas, should we assume that they are the wrong tool for creative endeavors? Taking such a position seems extreme. The problem lies in counting on the tool to do the work: We should no more expect a computer program to write an essay for us than we would expect a drill to build a bookshelf—or, for that matter, design one. People designed and built bookshelves before the cordless power drill was invented. Building took longer, but the bookshelf got built. Now, the process has been opened up to more people by the addition of tools such as the power drill. Perhaps at one time, people who could not turn a screwdriver with enough power to drive a screw into a board were forced to buy ready-made products; now, they can put together an entire bookshelf in minutes.

We can treat the computer as a power drill and simply enjoy the ease it brings to the writing process. Or, if we use our imagination a bit, we can take the analogy a step further to assert that the power drill may have affected the way people think about building: Perhaps people who never would have dreamed of designing a piece of furniture before the advent of the power drill can now visualize themselves not only building furniture but also designing it to their own needs and specifications. Because they know the ease with which they will be able to assemble it, and because they know that the drill can do things their hands cannot, they can add design elements to the furniture that might not have occurred to them otherwise. Similarly, a person who, before computers, might never have considered writing anything longer than a letter may now think nothing of sitting down in front of a word processor and typing out the first chapter of a novel. This is only one way computers may have changed our *perception* of the

writing process. The next section will discuss how computers have changed the *way* we write.

4. Does word processing amplify student performance in writing tasks?

In 1992, Ronald Kellogg and Suzanne Mueller performed two studies to assess the effect of word processing on writing performance; in each, they studied the performance of students writing in longhand versus those using computer word processors. They found that "only participants with extensive word processing experience matched the quality and fluency of those who wrote in longhand" (33). Using the computer does, however, restructure the process of writing, they found. They quote the research of Lillian Bridwell-Bowles, P. Johnson, and S. Brehe (1987) and Christina Haas (1989a), whose studies found that writers using word processors spend less time and effort on planning and that, because graphics were difficult to create in most word processing programs of the time, their planning uses fewer graphics; Haas and John Hayes (1986) and W. J. Hansen and Haas (1988) also discovered that use of a computer, while improving editing at the mechanical level, tends to discourage revision of the structure as a whole.

In the first study, Kellogg and Mueller found a marginally significant difference between the handwriting and computer conditions when spelling was considered; because their judges used spelling as one of the criteria for rating style, the computer essays were often rated lower in style. [The judges in my study were instructed not to consider spelling, for reasons that will be explained later.] They also found that the computer users wrote fewer words per minute than the longhand writers. I suspect, however, that a more recent study, performed strictly on elementary-age students, would have much different results because students are more likely to grow up using a computer and learning how to type than they were ten years ago. As Kellogg and Mueller admit, their study was

hindered by the fact that some subjects undoubtedly had more typing and word processing experience than others; to judge accurately the level of performance amplification, they add, they should perhaps have chosen subjects with a high level of experience.

The second experiment used the same subjects, but this time the subjects were given a survey asking them to rate their experience with computers, and products of the experiment were assessed based upon responses to this survey. After rating the products, Kellogg and Mueller found that even those subjects who rated themselves highly skilled at computer use fared no better in terms of writing quality than those writing in longhand. Those subjects with modest experience, however, did poorly, suggesting that their lack of experience "diverted attention from applying relevant knowledge to composing" (43). Indeed, other researchers have found that much of the modifying and editing done on word processors has either no effect or deleterious effect on the quality of the work.

Similarly, Lois Mayer Nichols (1996), in a study performed on elementary-school writers, found that "quality of the composition, accuracy of grammar, and reading ease did not differ significantly" between longhand writers and computer users (159). She quotes the findings of Gail Hawisher (1986) and Hawisher and Ron Fortune (1989), done at the high school and college level, showing no significant difference in quality between computer writing and handwritten work (160). However, Nichols also mentions the meta-analysis performed by Robert Bangert-Drowns (1993), who found that nearly two-thirds of such studies did, in fact, show improvement in the quality of writing when subjects used word processors (160).

In a study of 171 Texas sixth-graders, Penny Campbell (1987) found that students' attitudes toward computer use varied depending upon their computer skills. Students with average and high levels of skills demonstrated higher positive responses to the Computer Attitude Scale (CAS) than did those with only basic skills. In the same year, Karin Miller Wiburg studied 69 fourth-graders in California who were divided into three groups: The first group used computer programming activities to create their projects; the second group used applications such as word processing and graphics software; and the third, control group had no special instruction but used computer-assisted instructional software. In an analysis of written products, the treatment groups (those who used programming activities or word processing/graphics software for their projects, as opposed to students in the control group, who used only instructional software) both showed higher scores in higher-level cognitive skills than did the control group. The group using the programming activities achieved the highest scores of all.

These studies do not, however, deal with "creativity"—none of them claims to assess aspects of the creative process or of creativity in either product or producer. In fact, little experimental research exists, outside of Amabile's work, on the relationship between computer use and creativity. A few articles discuss creative people *using* computers; for example, Trevor Owen's 1995 article in *English Journal*, "Poems That Change the World: Canada's Wired Writers," recounts the story of a group of students composing poetry as part of an online group called WIER, or "Writers in Electronic Residence." As Owen asserts, "[T]he computer is no more a tool than Shakespeare is a book" (49). He calls the computer a "catalyst," an "experience": "The computer is not simply a tool, not a pen, but an experience. A field trip" (49). Did the computer

encourage creativity? If nothing else, it certainly engaged both student and instructor, as Owen points out: "Many students seemed surprised that . . . their teachers were actually interested in what they had to say." Suddenly, students could see their instructors as more than just correcting machines with red ink flowing from their fingertips (50).

Gail Hawisher and Cynthia Selfe (1998) agree with Owen's view of the computer:

> [C]omputers were becoming increasingly important in educational settings—not simply because they are tools for writing (they are not *simply* tools; they are, indeed, complex technological artifacts that embody and shape the ideological assumptions of an entire culture), but rather because these machines can serve as powerful catalytic forces in the lives of teachers and students. (Hawisher and Selfe, 333)

However, as mentioned above, their study (1987) of computer-assisted instruction in college classrooms found that students "neither revised more nor wrote better essays on computers with word processing capabilities" than they did with pen and paper or typewriter (336). The sole benefits seemed to be more drafts and greater fluency.

One study that deals directly with computers and creativity shows no benefit to computer-assisted instruction (CAI). In her study of 128 fourth-graders in Oklahoma, Sheryl Shanahan (1986) gave two experimental groups of 32 students each the task of using a dialogue form of computer-assisted instruction to generate a word bank for creative writing, and she assigned two control groups of 32 students each to a classroom without this form of CAI. Her subjects were given pre- and post-test Torrance Tests, those for Creative Thinking and Evaluation of Originality and Interest. Students in the experimental groups scored no better than students in the control groups. However, as discussed in the section on Tests of Creativity, the Torrance Tests may not be reliable indicators of creativity.

Albert Rouzie (2000), in an article in *Computers and Composition*, praised the possibilities inherent in modern software, citing the "playfulness of electronic discourse and how it might reshape student composition" (142). Using and composing hypertexts gives student writers an opportunity to work in a textual, as well as graphical and aural, space, and they are aware that they can give their readers a greater understanding and experience of the information they are sharing than would have been possible with simple text. (Think, for example, of a student publishing a Web site on a research topic: The student can provide the text of a paper, as well as pictures, sounds, and links to more information about the topic.) As Rouzie puts it, "the best of this play opens writers and readers to the text as dramatic, symbolic action" (142). If, in fact, the best of creative work comes from a level of "intellectual playfulness," as Amabile puts it, then one can infer from this assertion by Rouzie that computers may offer a great opportunity for highly creative output.

Of course, word processors can also hinder the creativity of writing. In another recent *Computers and Composition* article, Alex Vernon (2000), in a study of computerized grammar checkers, points out that students' willingness to write on the computer may be hampered by the constant presence of those annoying graphics that may—or may not—point out errors. In *Microsoft Word*, for example, possible spelling errors are brought to the author's attention by red wavy underlining. Although the red is a highly visible color between the default black text and white background usually seen in *Word* and other software, red may also remind students of the teacher's unforgiving pen.

How, then, do we show students (and, in some cases, their instructors) that "correct writing is not necessarily good writing" (Vernon, 347)? And again, stressing the

play aspect of creativity, "How do we encourage students to stretch their syntactic muscles, to risk incorrect usage in pursuit of complicated structures expressing complex ideas? How do we teach them to *play with sentences*" (347; emphasis added)? It is possible that using computers in the classroom, combined with intensive training in their use and plenty of time during which to become comfortable with their various features, is one reliable way to encourage students to play with words.

Computers bring a new feature to writing: a visual, electronic, interactive feature. Computers can easily do what manuscripts do with only limited success: They can link our words to other words, our thoughts to those of others, instantly. They can speak aloud, play music, share a recording of Martin Luther King's "I Have a Dream" speech. Put simply, computers are *fun*. A textbook may have an extensive list of references for the reader to consult, but taking the time to go to the library and look them up is sometimes difficult. Hypertext, by contrast, offers readers the opportunity to link to the author's thoughts immediately. Authors can add visual elements without needing graphic design teams. The visual elements themselves can link to other authors and ideas. The possibilities boggle the mind. Therefore, it seems perfectly logical to ask the question, "How does the computer affect the creative process and product?"

5. Does using word processors affect creative writing?

In a study using as subjects fifteen fourth-graders in their own classroom setting, Edith Christensen (1993) made several interesting discoveries about the effects of computer use on creative writing. First, she found that 14 of a group of 15 gifted students (12 of whom were rated by their teacher to be underachieving) had immediate gains in story length when they switched from handwriting to computers. The one exception was a subject who professed a preference for writing with a pencil and who claimed a dislike for writing in general.

The underachieving students consistently received higher total quality scores on their computer-written stories, while the high achievers' stories did not show significant improvement when the writers used computers (122). And again, the underachieving group had significant increases in divergent in-depth thinking (a measure of uniqueness in the writer's approach, said to be an indication of higher-level thinking processes) when they used computers. Interestingly, Christensen found that these same students, upon switching back to handwriting, reverted to lower-level thinking processes (124). For the central idea criterion, the writing tool did not seem to matter; all students showed improvement over time (125). Regarding the addition of relevant information, all but three subjects showed increased relevant information scores as their stories increased in length (as they did with computer use) (126). Subjects' organization skills were higher when they used the computer; however, for most of the students, organization scores steadily increased throughout the study, regardless of the writing method (127). Finally, for the language variety criterion, three of four underachievers in one group scored higher

when they wrote on the computer; but overall, the language variety scores did not appear to increase with length of story (99, 127).

The implications of Christensen's research are many. As she points out, much could be learned from continuing to follow this group of students as they become more proficient in computer use and especially in the various tools included with modern word processing software. The student's attitude toward the writing tool is important, she concluded, and will affect the results of his or her writing.

Early and thorough instruction in the use of computers is also partly responsible for the success of a class of high school creative writers in a study done by Dale Irvin Depweg (1991), although Depweg's methodology focuses on a process-oriented environment in teaching and not simply on the use of computers. Depweg's classes, entitled "Creative Writing and the Computer," met in the school's business wing in rooms where the layout ended up causing more difficulties than it solved: Typewriter desks were neatly arranged in rows facing the instructor's station, while computer desks holding Apple machines were interspersed throughout the adjoining classrooms, usually with two or more facing each other and with work surfaces adjacent to each computer. However, the rooms presented some problems: For one, Depweg had, in both semesters, more students than computers; also, some of the computers were in one of the adjoining rooms, out of earshot for much of the instruction; and finally, he says that he and his class were somehow made to feel like guests who "needed to be on our best behavior" (29). Regardless of these possible detriments, however, the course was popular throughout both semesters and had an increase in enrollment for the second term.

The goals of the course follow: (1) in-depth instruction and practice in creative writing with instruction in and access to word processing, (2) workshop format in which teacher and students published and gave comments on each other's work, (3) encouragement of pre-writing and revision, (4) topics to be chosen by students, (5) emphasis by the instructor on "real" questions rather than "rhetorical" ones, and (6) encouragement of student conferencing and questions (32). Student work was collected into individual portfolios. At the end of the semester, each student handed in a writing sample to be evaluated by two outside teacher/evaluators.

The system for evaluation was adapted from one used by Yamhill County (Oregon) as part of the selection process for a student literary magazine. Each sample was rated on a scale of 4–0 (4=outstanding, 3=above average, 2=average, 1=below average, 0=not observed) for each of six criteria: (1) unity, coherence, and organization; (2) clarity, originality, and development of theme; (3) overall development of character, character motivation, and dialogue; (4) overall development of plot and setting; (5) sophistication and effectiveness of diction and style; and (6) appropriate use of mechanics (e.g., spelling). Depweg asked judges to comment also on strengths and weaknesses in the piece and asked that they list their suggestions for the piece and additional comments, comparisons, and/or insights (40–41).

The workshop format, combined with intensive instruction in creative writing process and word processor use, proved a highly successful teaching format for Depweg's students. All student writing samples were judged to be "well above average," with five of 17 students receiving "outstanding" ratings on five of the six criteria (163). Beyond their success in the classroom, Depweg points out, following the instruction in

creative writing and word processing, his students took honors in school-wide writing contests, gained admittance to prestigious colleges, were published in school and outside publications, and had many other successes.

Concerning the negative aspects of the design, Depweg notes that time constraints were the most common complaint, pointing out that "[t]he technology of the computers, printers, and software, . . . which facilitated benefits for writing, revision, and publishing, could also absorb as much group, individual, and instructor time as they [sic] helped save" (167). As he accurately laments, spending writing time on trying to make temperamental network printers print or trying to save corrupted data disks can be a "new and irritating experience" for the average English language arts instructor (167).

One major positive finding, beyond the successes of the writing students, was that their attitude toward writing was more positive than the attitudes of Depweg's previous students in non-workshop formats. He points out that many of the students would continue to write quietly while he lectured, and they were often disappointed at the end of class time or if a lecture or conference day was going to take away some of their in-class writing time (170).

Regarding the technology used in this classroom design, Depweg admits that "it seems somewhat academic to debate whether or not the integration of word processing and computers into the English and writing classroom should or will happen" (181). Indeed, between 1986–87 (when his study took place) and 1991 (when he published his dissertation), computers went from being a new and wonderful tool in many schools to being almost ubiquitous in all but the poorest of districts.

The two studies cited above—Christensen's and Depweg's—show clear evidence that computers in the classroom are more than simply the method of the day. True, many of today's students grow up using computers in their homes, and many of them would be at a loss in a writing environment in which they were expected to write with pen and paper. However, computers are more than simply modern (if expensive) pens; they are part of the writing process of today's writers. Computers have the potential to allow, and even encourage, greater expression and creativity in the users—given the right classroom environment and the right training. Throwing a group of students with no training into a computer lab and expecting them to produce creative work may bring no more success than asking them to create their work in longhand—and it may hinder the writing process for those with marginal computer skills. But, as Depweg found, when computer use is coupled with training in keyboard skills and in word processing software, writers experience greater benefits.

6. How does the existing research on word processor use and creativity apply to college-age writers?

One type of student neglected in much of the existing research is the college writer. Christensen's study, for example, focused on fourth-graders; Depweg's students were sophomores through seniors in high school. Much research has been done in college settings on computer use in classrooms, but none has focused solely on the computer's relationship to the creative process and individual aspects of creativity. The results of my own study show how several generally accepted aspects of creativity—namely, novelty of idea, word choice, and development/organization—are affected by using computers for composition. In Section 2, I discuss the methodology and design of the study, and in Section 3, I discuss the results of the study in relation to previous research and to the future of composition classes at the college level. Finally, in Section 4, I present the results of a questionnaire on Technology in the Classroom. This questionnaire, designed as a follow-up to my study, asked students at the same writing level as the test subjects to respond to eight questions about their level of experience and comfort with computer technology. As a soon-to-be college writing instructor who plans to continue researching at the doctoral level as training for teaching both creative and technical writing, I am fascinated by the implications of computer use for creative writers.

Section 2:

A Study of the Effects of Computer Use on Narrative Essays of College Freshman Writers

Because of the impossibility of choosing those criteria that define a creative work—and therefore, by implication, a creative writer (though some argue that the two are unrelated)—I settled upon three criteria (*idea*, *word choice*, and *development/ organization*) that are frequently associated with subjective judgments of creativity in writing. In discussions with the judges and with advisors, I determined that using such criteria as "novelty of structure" and "reading ease" would be inadvisable because neither has been shown to indicate a high level of creativity in either product or author.

To determine whether the three creativity-related criteria listed above are affected by the use of computer word processing software, I devised a study in which five groups of freshman writers created narratives following a prompt. The study was structured as follows:

1. Demographics

The student subjects were all part of a composition course called "Writing I," a beginning writing course intended for freshmen who, based on performance on a Composition and Reading Placement Test (CRPT), were judged not to need developmental practice in writing. Youngstown State University requires that every incoming freshman take two college writing courses—Writing I and Writing II (a more advanced course in argumentative writing)—within a certain time following matriculation (students achieving a lower score than that determined as the minimum for entrance into Writing I are required to pass a developmental course preceding Writing I). Thus, I judged that the students in the sample would have roughly the same level of skill in essay writing.

I chose five sections whose instructors were fellow graduate assistants. The fact that these classes had GAs for instructors should not adversely affect my efforts to randomize subject selection, for two reasons: First, students do not know they are signing up for a GA-taught class when registering; and second, the samples were taken early enough in the semester that any difference between the teaching styles of new teachers and seasoned professors should have had negligible, if any, effect on the students' writing.

I structured the study to randomize for day and time of class meetings to ensure that groups did not tend toward one particular type of student—e.g., perhaps a certain type of person prefers to take only early-morning classes on weekdays. As a result, I sampled five classes, which met on different days of the week and at different times during the day.

The gender breakdown of the sample is as follows: 34 subjects were female, and 36 were male (two females were later disqualified because they did not consent to participate in the study). In the Analysis of Results section, I will show gender differences in rating results.

2. Structure of the Experiment

This experiment is structured with two independent variables. Factor 1, or the Medium Factor, has two levels: the handwriting treatment is the use of longhand to write an essay; and the computer treatment is the use of the computer word processor to write an essay. Factor 2, or the Gender Factor, is the gender of the subject. (See Table 2.1.) My working hypothesis, or H_1, was that the use of computer word processors may slightly affect

creativity, depending on the user's level of computer skill, and that the use of word processors directly affects length of essays (i.e., number of words). The null hypothesis, or H_0, was that the use of word processors has no effect on creativity in each rated criterion (idea, word choice, and development/organization) and that it has no effect on essay length.

Table 2.1. Structure of Experiment

	Factor 1: Writing Medium	
Factor 2: Gender	μ_1: *Hand*	μ_2: *Computer*
Males	16	20
Females	17	15

I chose the Post-Test Only design for this experiment. The experiment was expressly designed to be a low-stress, culturally neutral exercise. Each class was randomly divided into two groups: Sample group 1, the "handwriting treatment" group, was given a handout containing the writing prompt, explicit instructions, and plenty of lined writing space; sample group 2, the "computer treatment" group, was seated at computers upon which the writing prompt had already been installed and opened in *Microsoft Word 97*. The group with the handout was asked to write with pen or pencil for the full time (40 minutes), and the computer group was asked to type responses and save them to a floppy disk, which was supplied for them. The subjects wrote during a normal class period during which the class met in a computer lab. I made every effort to ensure that those writing by hand had enough desk space (keyboards were moved and CPUs shut down to discourage the temptation to check the computer for spelling, etc.). The instructors and I strongly discouraged talking; however, these efforts met with varied

success. In one class, the instructor had to relocate to the back of the room to discourage two computer subjects from loudly chatting about personal topics. While some researchers suggest that creativity is best encouraged by placing no restraints upon the subjects, we decided that loud talking was disruptive to those subjects who prefer to work in a quiet atmosphere.

Because of research suggesting that the subject's awareness of rewards and/or evaluation significantly decreases the creativity of products, we made clear to the participants that they were not being graded on the essay and that they would simply receive in-class-assignment credit (which differed according to instructor) for the work. As a result, we hoped that each participant would feel free to "have fun" with the assignment (the handout even reads, "Please have fun with this assignment!"), without having to worry about grades or competition.

The time limit for the writing was, as stated above, 40 minutes. As part of the introduction, I informed students that they would be told when they had five minutes, and then one minute, remaining. They were encouraged to write for the entire time allotted, although many did not.

3. Prompt

The essay prompt follows: "Write a narrative about the following: One morning, you (or your main character) awaken to discover that humankind has developed—or been given—the ability to become invisible at will."

4. Other Information on the Assignment

Below the prompt, an area was provided for "brainstorming." Some students made use of it, making lists, drawing diagrams or flow charts, or writing a short paragraph; others did not use the area. At the end of the writing space, the handouts thanked the participants, and the computer-based prompt reminded computer users to save their files.

5. Judges and Rating

Three judges rated the essays. One was a Youngstown State University professor emeritus with 43 years of teaching experience (including composition, among other subjects) and eight years of essay-judging experience with Educational Testing Service; one was a Youngstown State University professor with 22 years of teaching experience (again, including freshman comp); and the third, or "tiebreaker" judge, was a creative writer with an English degree from a university in England and over ten years of creative writing experience.

It was agreed that a judges' training session was not necessary and could in fact skew the results of the final ratings; therefore, the 68 qualifying essays were given to the first two judges, who rated them without a training session. Should I have chosen judges based on "homogeneous views of creativity" (Amabile, *Creativity* 42)? "[I]t seems most appropriate to simply rely on the assumption that experts in a domain do share creativity criteria to a reasonable degree," says Amabile. "The essence of the consensual definition is that experts in a domain can recognize creativity when they see it, and that they can agree with one another in this assessment. . . . [T]he judges should not be trained by the experimenter to agree with one another. . ." (42).

The judges themselves were chosen for a variety of reasons. The two professors were chosen for their vast experience in judging writing samples; the creative writer was chosen because she could judge samples from the point of view of a creative person. One professor comes from an English education background and has worked in diverse populations throughout the eastern and southern United States, as well as being a rater for ETS; the other comes from an American studies and film studies background and has much experience with developmental college writers, in addition to scoring English Placement Tests at YSU for many years. Although the third judge had no teaching experience, she was deemed qualified to rate on originality in the three criteria chosen.

The judges rated each of the 68 essays individually on these three criteria: idea, word choice, and development/organization. One judge suggested that the term "creativity" not be used in describing the criteria, for doing so would imply that these criteria define creativity, and I did not wish to suggest that creativity could or should be defined in this manner, although I do contend that high ratings in these three areas may *suggest* a high level of creativity in the author. Accordingly, I acknowledge that the rating system is, as Amabile admits, strictly subjective (*Social* 38).

Although the judges and I considered using the holistic scoring method (as defined by ETS), our decision to rate each essay on three criteria made defining our method as "holistic" inappropriate. Holistic scoring asks the reader to score an essay on the "total impression it creates rather than for individual aspects" (ETS, "What Is Holistic Scoring?" online). Analytic (or primary trait) scoring, on the other hand, allows the reader to examine individual aspects of an essay—appropriate to my study, because I wanted to see if using computer word processors affects different aspects of creativity

differently. Our analytic method is, however, derived from ETS's holistic method: In most of their assessments, "two readers provide separate, independent judgments. Each reader awards a single score for the overall quality of the essay based on an integrated set of criteria . . . [typically including] organization, development of ideas, style, mechanics, diction, and usage. . ." (ETS, online).

Each judge was given a sheet with the numbers from 1 to 68 (one number corresponding to each of the 68 essays). The scale chosen for rating each criterion was 1–4, with 4 being the highest possible rating. The judges and I decided that a scale of 1–4 was preferred over, for example, 1–5, because when the latter scale is used, judges tend to lump papers upon which they are undecided into the middle, rating them a 3. We also agreed that more than four or five possible ratings points would be excessive for so few criteria. Judges were to give each essay three scores: one for idea, one for word choice, and one for development/organization. Judges were instructed to go through the essays in random order, even though the essays were already numbered randomly. Judges worked independently of one another and did not confer at any time during the rating process.

I randomized the essays in the following manner: After collecting all essays, both handwritten and computer written, I made photocopies of the handwritten essays and employed two fellow graduate assistants as transcribers. Using the same *Microsoft Word* template that subjects used during the experiment, the transcribers entered the handwritten text, so that all handwritten essays could be printed on a laser printer and would look no different from the computer-composed essays. Text was entered exactly as written, including misspelled words. The reason for including the misspellings is that, due to an unforeseen problem with the use of form fields in *Microsoft Word 97* (the

Spell-Check feature does not work on text entered in a form field), the computer writers could not easily use Spell-Check. As a result, judges did not consider spelling accuracy in rating the essays. If the handwritten essay included text in the Brainstorming area, it was typed into the computer file; however, any handwritten graphics (such as flow charts) were not included. Also, none of the computer writers used graphics in the Brainstorming area, and judges did not consider any information in the Brainstorming area when assessing the essay. In this manner, I ensured that all essays appeared exactly the same to the judges; therefore, no possibility existed for bias toward either handwritten or computer-written work.

6. Avoiding Threats to Internal Validity of the Study

The main method I used to avoid threats to validity was randomization. I took care to randomize selection of subjects (to the extent possible; some inter-subject similarity was desirable, namely similarity in level of writing experience), times of classes, days of classes, and assignment of subjects to testing conditions (e.g., handwriting or computer).

I equalized the testing conditions as much as possible and controlled for variables that might affect subject behavior. Each class took place in a well-equipped computer lab; each class had roughly one to two classes' notice of the upcoming essay assignment and was told very little about the assignment and nothing about its experimental nature. When I arrived, I briefly explained that the subjects were taking part in a study but did not detail the purpose of the study, other than to say that the results would be part of my thesis and that anyone who was interested could contact me later to see the work. Subjects were told that they would be asked to read and sign a consent form for Human Subjects purposes,

and that they could choose not to participate in the experiment, with no ill effects on their grade (provided the essay was completed and turned in to the instructor despite the participant's unwillingness to allow me to use it in my study). Of the 70 essays obtained over five days, two were disqualified because the students opted not to participate in the research.

The use of the Post-Test Only design avoided the problem of Statistical Regression to Mean (a tendency for scores in post-treatment assessments to shift toward the mean). Because the entire experiment was structured to allow for randomization, no pre-test was required. Had I not randomized for subject selection and other factors, I would have had to test each group twice—first having all subjects write one way, then having them write the other—to get valid results. In addition, the Post-Test Only design eliminated the need to discourage subjects from discussing the experiment during the testing period: The entire experiment took place in one day for each group, and the likelihood that subjects from one class would pass on information about the experiment to subjects in another class was slim, considering the large number of students taking Writing I in a given semester. Finally, this design prevented the problem of "mortality," or subject dropouts between pre- and post-test.

7. Additional Criteria Being Considered

In addition to the individual subjective ratings based on the three criteria listed above, I noted demographic data for each group, including ages, ethnicity, and gender of subjects; the date and time each experiment was performed; the number of subjects in each class

who wrote their essays on computers, versus the number writing by hand; and the total number of subjects in each class. (See Table 2.2.)

I also noted and considered the total number of words in each essay. I hoped to determine whether a correlation exists between number of words in an essay and method used for writing, and also whether a correlation exists between number of words and level of creativity (in the three areas noted) of the essay. Finally, I wished to determine whether a difference exists between genders in either writing condition (handwriting or computer).

Table 2.2. Test Group Demographics

GROUP A	n=12		t=12:30 p.m.	n_m=6	n_f=6
ASBURY	n_1=6	n_2=6		n_c=12	n_o=0
GROUP B	n=18		t=11:00 a.m.	n_m=8	n_f=10
BLEI	n_1=9	n_2=9		n_c=17	n_o=1
GROUP C	n=17		t=10:00 a.m.	n_m=11	n_f=6
BENTON	n_1= 8	n_2=9		n_c=15	n_o=2
GROUP D	n=16		t=1:00 p.m.	n_m=8	n_f=8
GRANGER	n_1=6	n_2=10		n_c=14	n_o=2
GROUP E	n=7		t=12:00 noon	n_m=3	n_f=4
WEST	n_1=4	n_2=3	(Saturday)	n_c=6	n_o=1

- Note: Two students, both in the μ_2 condition (computer), opted out of participation. The total for the n_2 column—37—does not reflect the removal of the essays by the two students who opted out.

Key:

n=number of subjects in group	n_1=number of subjects in μ_1 (handwriting condition)	n_2=number of subjects in μ_2 (computer condition)	t=time of day test given (all on weekdays except as noted)
n_m=number of male subjects in group	n_f=number of female subjects in group	n_c=number of Caucasian subjects in group	n_o=number of non-Caucasian subjects in group

Section 3:

Analysis of Experiment Results

1. Summary of Overall Results

Judges rated all 68 essays in each of three criteria (idea, word choice, and development/organization). As a result, judges had three opportunities per essay to agree or disagree, or 204 opportunities overall. Out of these 204 opportunities, the judges' ratings differed by more than one point on only 29 occasions, or 14.2% of the time. I chose to count only those differences of more than one point: Although one judge tended to give higher scores than the other, both judges gave higher scores to the same essays; therefore, I reasoned that only when the judges' ratings disagreed by more than one rating point should I consider them discrepant. Paul Diederich, in *Measuring Growth in English* (1974), defends a reliability of .80 (or 80%) as "adequate for practical decisions in the ordinary course of schoolwork" (2). I am pleased that the judges I chose achieved an inter-rater reliability of .858 (or nearly 86%). Having obtained this reasonably high level of reliability, I can defend my decision not to use "model" essays to train the judges.

After collecting all the scores for each of the three criteria being judged, I used the mean scores to compute the effect (if any) of computer use on these three criteria. Using methods from a statistics text for students in psychology and education (Gravetter and Wallnau 1985), I then performed an Analysis of Variance (ANOVA) to determine whether my results were statistically significant. I obtained F-ratios for each criterion of <1, meaning the ANOVA test discerned no treatment effect. Generally, F-ratios of >1 are necessary for statistical significance, and with such a small sample (68 subjects), much higher F-ratios (closer to 3.9–4.0, according to Gravetter and Wallnau) than I obtained would have been necessary to show a significant treatment effect. (See Tables 3.1–3.3.)

Table 3.1. F-Test Two-Sample for Variances: Idea Criterion

	Variable 1	*Variable 2*
Mean	2.666666667	2.728571429
Variance	0.432291667	0.549159664
Observations	33	35
df	32	34
F	0.78718758	

Variable 1 corresponds to the Handwriting condition; Variable 2 corresponds to the Computer condition. Observations=the number of subjects in each test group. The F value tells us that the treatment (computer use) had no effect.

Table 3.2. F-Test Two-Sample for Variances: Word Choice Criterion

	Variable 1	*Variable 2*
Mean	2.439393939	2.428571429
Variance	0.464962121	0.546218487
Observations	33	35
df	32	34
F	0.851238345	

Variable 1 corresponds to the Handwriting condition; Variable 2 corresponds to the Computer condition. Observations=the number of subjects in each test group. The F value tells us that the treatment (computer use) had no effect.

Table 3.3. F-Test Two-Sample for Variances: Development/Organization Criterion

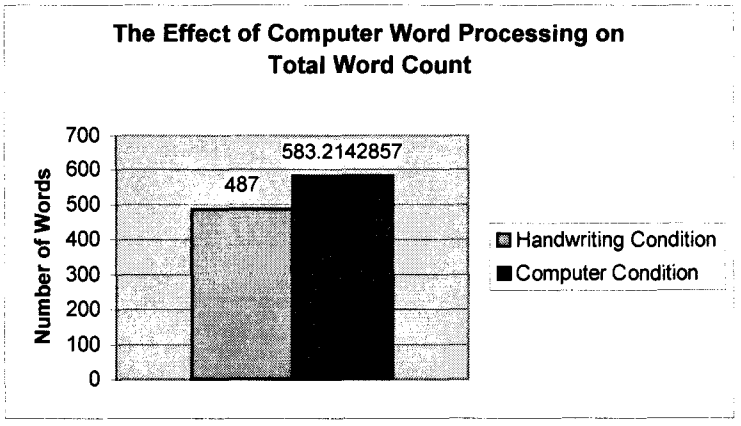
	Variable 1	*Variable 2*
Mean	2.666666667	2.814285714
Variance	0.369791667	0.648319328
Observations	33	35
df	32	34
F	0.570385072	

Variable 1 corresponds to the Handwriting condition; Variable 2 corresponds to the Computer condition. Observations=the number of subjects in each test group. The F value tells us that the treatment (computer use) had no effect.

Overall, scores did not increase significantly in any of the three criteria judged (meaning my null hypothesis, or H_0, was true). The simple result of the experiment is that using a computer word processor does not significantly increase the writer's scores in creativity-related areas such as Idea, Word Choice, and Development/Organization. The computer did, however, affect Word Count: The average word count for essays written in

the computer condition was 18.15% greater than the average for essays written in the longhand condition. (See Figure 3.1.)

Figure 3.1.



2. Results Analyzed by Gender

The scores do not suggest that we should dismiss the experiment's results, however. If we look at the results by gender, we see greater treatment effects (benefits of using the computer) for females than for males in all criteria. For example, while the males in this study received almost no benefit (less than a percentage point) in the computer condition in the Idea criterion, the females scored 9.25% higher when using the computer. (See Figure 3.2.) The benefits to both genders are negligible in the Word Choice criterion (males' scores increased 1.41%, females' 2.81%), but both genders scored higher in Development/Organization in the computer condition: males' scores increased by 5.98%, and females' by 9.70%. (See Figure 3.3.)

Figure 3.2.

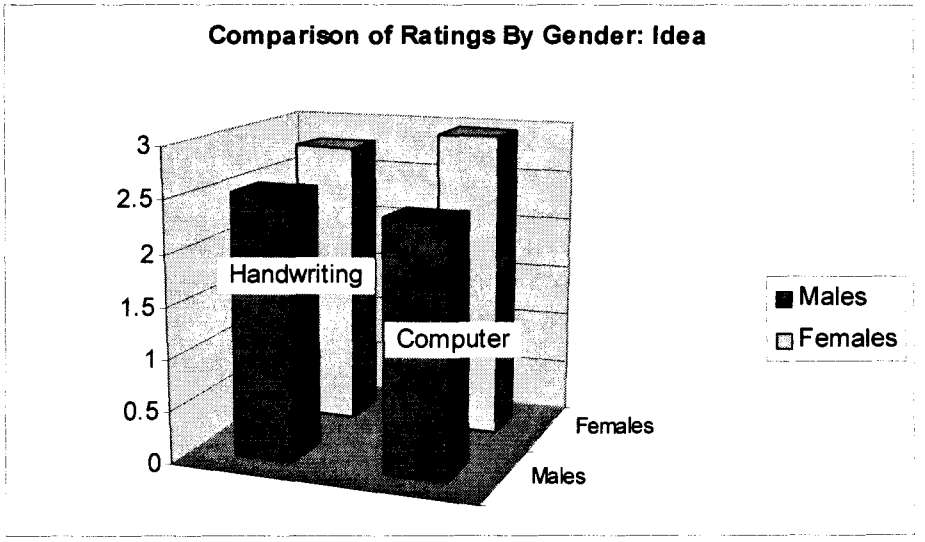
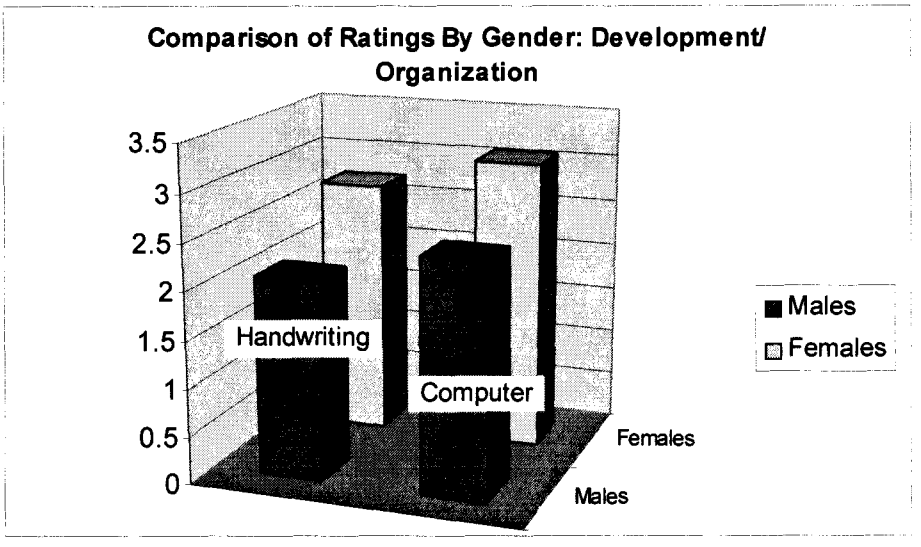


Figure 3.3.



The increase in mean word count is not surprising; unlike the subjects of similar studies in the past, these subjects, for the most part, grew up using computers and have a reasonable level of keyboarding skill. (See Section 4: Responses to "Technology in the Classroom Questionnaire" for a discussion of subjects' self-described computer and word processing skills.) But the by-gender results are curious: Why would males gain no

benefit from using word processing, while females using computers scored nearly 10% higher than females writing in longhand in two criteria related to creativity?

The criteria used to rate each essay are, theoretically, indicators of creativity in the product. Should we assume, then, that the male subjects produced less creative products than the female subjects? The results of this study are not conclusive enough to allow us to make that assumption. At the very least, the results may indicate a need for further research into gender differences in areas such as creativity, keyboarding skill, and computer knowledge; ideally, these studies would use a much larger number of subjects than my study did and would be run by both computers-and-composition researchers and social/behavioral scientists. My study was limited by lack of access to a large number of subjects, and perhaps by the choice of prompt for the essay, which may have encouraged gender differences; however, I hope to continue this research, using my own students as subjects, for many years. Every new group of freshmen seems to have better computer skills than the group before it—and, correspondingly, less desire to use longhand for composition. Eventually, forcing a subject to write an essay in longhand may even be considered some sort of punishment, as computers become an indispensable tool in students' lives.

Section 4:

Responses to the "Technology in the Classroom" Questionnaire

1. Introduction

In an attempt to understand better the skills and needs not only of the students I tested but also of freshman writers in general, I administered a detailed questionnaire asking respondents to describe their experience with computers, word processing software, and the Internet. (See Appendix 1 for the complete questionnaire.) I hoped that the responses would help me interpret the creativity ratings on the 68 essays; for example, I wanted to know how likely students in a particular age group are to have grown up using a computer at home. The questionnaire turned out to be extremely useful, and I plan to put the results into an Internet-accessible database and to make the questionnaire itself into a Web form that can be accessed by many composition classes. With only 56 completed questionnaires from which to make assumptions, I am looking forward to making judgments that are more accurate by using a greater number of respondents.

I must qualify any assumptions by stating that not all of the 68 subjects who took part in the essay experiment also filled out the questionnaire; only about 25 of those students had time to fill out the questionnaire after doing the essay. The other responses came from three other College Writing I classes. Comparing the percentages of students in each age group and of each gender, I found the questionnaire group to be similar to the essay group. Therefore, it seems logical to infer that assumptions made about the questionnaire group may also be applicable to the essay group.

2. Summary of Results

Overall, the responses show that most students, regardless of age group or gender, have some computer and word processing experience. Only a small percentage claimed to be "novice" users. In fact, almost 40% of males and nearly 54% of females said they have "extensive" computer experience. (See Table 4.1.)

Table 4.1. Level of Experience with Computers

Question 1: I would describe my experience level in computer use as follows:

	ALL MALES		ALL FEMALES	
I am a novice computer user	5	17.86%	0	0.00%
I have limited computer experience	4	14.29%	9	32.14%
I have taken at least one class in which computers were used	4	14.29%	3	10.71%
I have taken several classes in which computers were used, and/or I have extensive computer experience from using a home computer	11	39.29%	15	53.57%
I am an expert computer user	3	10.71%	1	3.57%
Respondents	*27*		*28*	

Note: *Not all respondents answered every question; therefore, some totals do not add up to 100%.*

Likewise, very few—none of the males and only one of the females—said they "cannot type at all." At least half have some level of typing skill, and about a third of the men and over a fifth of the women said they have "extensive" typing experience. (See Table 4.2.)

Table 4.2. Keyboarding skill

Question 2: I would describe my keyboarding (typing) skills as follows:

	ALL MALES		ALL FEMALES	
I cannot type at all	0	0.00%	1	3.57%
I have limited typing skills	10	35.71%	6	21.43%
I have taken a typing class or have otherwise developed good typing skills	8	28.57%	11	39.29%
I have taken extensive keyboarding classes, and/or I have typed a majority of my schoolwork	9	32.14%	6	21.43%
I work or have worked at a job requiring typing speeds of 12,000 kph or 60 wpm or more, or have equivalent typing/keyboarding skill	1	3.57%	4	14.29%
Respondents	*28*		*28*	

All but one of the males and all but one of the females have some experience with word processing software. Half the men and almost 68% of the women have taken at least one class in a word processing application or have equivalent knowledge. (See Table 4.3.) The vast majority of both genders have used *Microsoft Word*—almost 86% of men and 93% of women; in addition, a large percentage of both have used *Corel WordPerfect*, and about a fifth of the men and a tenth of the women have used *Macintosh* software. (See Table 4.4.)

Table 4.3. Experience with Word Processing Software

Question 3a: I would describe my familiarity with word processing software as follows:

	ALL MALES		ALL FEMALES	
I am not at all familiar with word processing software	1	3.57%	1	3.57%
I have limited experience with wp software	9	32.14%	8	28.57%
I have taken a class in a wp application or have equivalent experience/knowledge	5	17.86%	13	46.43%
I have taken several classes in multiple wp applications or have equivalent experience/knowledge	9	32.14%	6	21.43%
I am an expert wp user	4	14.29%	0	0.00%
Respondents	*28*		*28*	

Table 4.4. Familiar Word Processing Applications

Question 3b: Software with which I am familiar (check all that apply):

	ALL MALES		ALL FEMALES	
Corel WordPerfect	10	35.71%	18	64.29%
Microsoft Word or Works	24	85.71%	26	92.86%
Macintosh applications	6	21.43%	3	10.71%
Other (please specify)	0	0.00%	3	10.71%
Responses	*40*		*50*	

Note: *Because respondents could choose more than one response to this question, total responses are greater than totals for the other questions.*

Interestingly, more men than women had computers at home when they were growing up. Almost 79% of men, versus only 39% of women, had a computer at home. A future researcher may wish to study whether girls who have only female siblings—or no

siblings—are less likely to have had computers at home than are girls who have male siblings. (See Table 4.5.)

Table 4.5. Computers in the Home

Question 4: I would describe my background in relation to computers as follows:

	ALL MALES		ALL FEMALES	
I did not have a computer at home when I was growing up (for whatever reason—they weren't invented yet, we didn't have the money, etc.)	3	10.71%	10	35.71%
I did not have a computer in my home but had access to one elsewhere	3	10.71%	7	25.00%
I had a computer at home when I was growing up but was not permitted to use it	1	3.57%	0	0.00%
I had a computer at home and used it at least occasionally	21	75.00%	11	39.29%
Respondents	*28*		*28*	

Reflecting the fact that the majority of respondents fall into the "traditional student" age of 18–22, the vast majority of both genders prefer to write using either a combination of longhand and computer or solely on computer. Only about 15% of women and 11% of men are reluctant to use computers in the composition process. (See Table 4.6.)

Table 4.6. Use of Computers for Writing

Question 5: I would describe my use of computers for writing as follows:

	ALL MALES		ALL FEMALES	
I prefer to handwrite throughout the writing process, including final drafts	1	3.57%	1	3.57%
I prefer to handwrite throughout the writing process, but will reluctantly type any final drafts or have them typed for me	2	7.14%	3	10.71%
I use a combination of handwriting and typing in my writing process	13	46.43%	9	32.14%
I do very little or no handwriting and prefer to perform the entire writing process on computer	12	42.86%	15	53.57%
Respondents	*28*		*28*	

When asked about their level of comfort with computer technology, the majority express a high level of comfort—93% of women and 79% of men—although 15% of women and 18% of men think we rely too heavily upon computers. More males than

females said they are "uncomfortable" with using computers—18% of men versus fewer than 8% of women. (See Table 4.7.)

Table 4.7. Level of Comfort with Computers

Question 6: I would describe my comfort level with computer technology as follows:

	ALL MALES		ALL FEMALES	
I am very uncomfortable with computers and would prefer not to have to use them	1	3.57%	1	3.57%
I am uncomfortable with computers but feel I must learn to keep up with technology	4	14.29%	1	3.57%
I am comfortable with computers and am eager to learn more and to ensure their place in my educational future	17	60.71%	22	78.57%
I am comfortable with computers but do not think we should rely so heavily upon them	5	17.86%	4	14.29%
Respondents	*27*		*28*	

Most of the respondents are familiar with the Internet and the World Wide Web: While no respondents claimed to have *no* desire to learn about them, almost 11% of men said they have "little or no experience and wish to learn more." Half of men, and 57% of women, said they use the Internet and WWW "extensively." (See Table 4.8.)

Table 4.8. Internet and World Wide Web Use

Question 7: I would describe my familiarity with the Internet/World Wide Web as follows:

	ALL MALES		ALL FEMALES	
I have little or no experience with the Internet and do not wish to learn	0	0.00%	0	0.00%
I have little or no experience and wish to learn more	3	10.71%	0	0.00%
I have moderate experience using the Internet for mainly personal/recreational uses	6	21.43%	7	25.00%
I have moderate experience using the Internet for mainly scholastic uses	5	17.86%	5	17.86%
I use the Internet extensively for business, recreation, and school purposes	14	50.00%	16	57.14%
Respondents	*28*		*28*	

Finally, men and women seem to agree that the Internet is at least somewhat useful for research and that information found there is at least somewhat reliable. But fewer than a third of men and only a quarter of women do the "majority" of their research

online; and while almost half of men said they "always" find high-quality information, only 18% of women do. (See Tables 4.9 and 4.10.)

Table 4.9. Satisfaction with Online Research

Question 8a: I would describe my level of satisfaction with using the Internet for scholastic purposes as follows:

	ALL MALES		ALL FEMALES	
I do not find the Internet to be a useful tool in scholastic research	1	3.57%	0	0.00%
I find the Internet to be somewhat helpful in research	17	60.71%	21	75.00%
I do the majority of my research online and rarely or never cannot find what I need	9	32.14%	7	25.00%
Respondents	*27*		*28*	

Table 4.10. Satisfaction with Quality of Online Information

Question 8b: I would describe the quality of information I have found on the Internet as follows:

	ALL MALES		ALL FEMALES	
Information I find on the Internet is basically worthless	1	3.57%	0	0.00%
Spotty: sometimes useful and reliable, sometimes not, depending on source	14	50.00%	21	75.00%
I am always able to find reliable, high-quality information on the Internet	13	46.43%	5	17.86%
Respondents	*28*		*26*	

3. Discussion of Results

The number of respondents of each gender in each age group is as follows:

Age Group	Gender	
	Male	Female
18–22	21	17
23–30	5	5
31–40	0	4
41–50	1	2
50+	1	0

In the tables that follow, some columns of percentages do not add up to 100%. Occasionally, one or more respondents skipped a question; I chose to base the percentages in that column on the total number of respondents in that age group, instead of the number who actually responded. Where percentages add up to *nearly* 100%, errors are due to rounding to two decimal places.

3a. Question 1: Level of experience in computer use

Even though the majority of all students, both male and female, have at least some computer experience, it is interesting to note that almost 10% of 18–22-year-old males consider themselves "novices," and 40% of 23–30-year-old males said the same. Also, men in the 18–22-year-old group are more than twice as likely to consider themselves "expert" computer users (14.29% of males versus 5.88%—one respondent—of females), even when their answers to subsequent questions do not necessarily support this claim. Because of the low number of respondents over age 40, I will not make assumptions about this age group based on findings from the questionnaire.

Almost half of men in the 18–22 age group and a fifth of those in the 23–30 age group said they have taken "several" computer classes or have "extensive" computer experience, while none of the respondents 31 and over do. Of the women, however, more than half of the 18–22 age group, 60% of the 23–30 age group, 25% of the 31–40 age group, and all the women 41–50 said they have taken "several" classes or have "extensive" experience. The wording of the question included either classes using computers *or* equivalent experience on a home computer, so either women are taking more computer-related classes than men, or women are making up for the lack of computers in their homes by finding machines to use elsewhere. (See Table 4.11.)

Table 4.11.

Question 1: I would describe my experience level in computer use as follows:	**MALES, AGES**					**FEMALES, AGES**				
	18-22	**23-30**	**31-40**	**41-50**	**50+**	**18-22**	**23-30**	**31-40**	**41-50**	**50+**
I am a novice computer user	9.52%	40.00%	0	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0
I have limited computer experience	19.05%	0.00%	0	0.00%	0.00%	29.41%	40.00%	50.00%	0.00%	0
I have taken at least one class in which computers were used	9.52%	20.00%	0	0.00%	100.00%	11.76%	0.00%	25.00%	0.00%	0
I have taken several classes in which computers were used, and/or I have extensive computer experience from using a home computer	47.62%	20.00%	0	0.00%	0.00%	52.94%	60.00%	25.00%	100.00%	0
I am an expert computer user	14.29%	0.00%	0	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0

3b. Question 2: Level of typing skill

Overall, only one respondent claimed she "can't type at all." Both of the men in the 41 and up group said they have "limited" typing skills, however, versus only one of the women in the same age group; the other three have taken at least one typing class or have equivalent skill. All of the men age 18–30 have at least some typing skills, and at least 60% of men in this group have taken a class or have equivalent skill. The ability to type is crucial in word processor use; without it, student writers are handicapped. Using these

responses to analyze the handwriting-versus-computer experiment, we can perhaps attribute the jump in word count in the computer condition to the great number of students who begin college with at least some typing skill. (See Table 4.12.)

Table 4.12.

Question 2: I would describe my keyboarding (typing) skills as follows:	MALES, AGES					FEMALES, AGES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
I cannot type at all	0.00%	0.00%	0	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0
I have limited typing skills	28.57%	40.00%	0	100.00%	100.00%	23.53%	20.00%	25.00%	0.00%	0
I have taken a typing class or have otherwise developed good typing skills	33.33%	20.00%	0	0.00%	0.00%	35.29%	60.00%	0.00%	100.00%	0
I have taken extensive keyboarding classes, and/or I have typed a majority of my schoolwork	33.33%	40.00%	0	0.00%	0.00%	29.41%	20.00%	0.00%	0.00%	0
I work or have worked at a job requiring typing speeds of 12,000 kph or 60 wpm or more, or have equivalent typing/keyboarding skill	4.76%	0.00%	0	0.00%	0.00%	11.76%	0.00%	50.00%	0.00%	0

3c. Question 3: Familiarity with word processing software

No respondent in the 18–22 age group claimed to be completely unfamiliar with word processing. Only two respondents—one male in the 23–30 age group and one female in the same group—make that claim. The rest of the results are fairly evenly spread across experience levels and age groups, with about 24% of both men and women in the 18–22 age group saying they have "limited" experience, 24% of men and 59% of women in that group having at least one class or equivalent experience, and the rest having had several classes. About 19% of men 18–22 claimed to be "expert" word processor users. (See Table 4.13.)

Table 4.13.

Question 3a: I would describe my familiarity with word processing software as follows:	MALES, AGES					FEMALES, AGES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
I am not at all familiar with word processing software	0.00%	20.00%	0	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%	0
I have limited experience with wp software	23.81%	40.00%	0	100.00%	100.00%	23.53%	40.00%	50.00%	0.00%	0
I have taken a class in a wp application or have equivalent experience/knowledge	23.81%	0.00%	0	0.00%	0.00%	58.82%	0.00%	25.00%	100.00%	0
I have taken several classes in multiple wp applications or have equivalent experience/knowledge	33.33%	40.00%	0	0.00%	0.00%	17.65%	40.00%	25.00%	0.00%	0
I am an expert wp user	19.05%	0.00%	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0

Of the women, 88% of the 18–22 age group and all of the respondents over 22 said they are familiar with *Word* or *Works*; the figures for the men are similar. *Corel*'s *WordPerfect* is the next most popular software, with more women than men expressing familiarity with it. As expected, only a few have used *Mac* software, and those respondents who checked "Other" usually specified a software package that was not actually a word processing application (e.g., Excel). The labs used by Youngstown State University's English Department for composition classes all have *Microsoft Word* for IBM. (See Table 4.14.)

Table 4.14.

Question 3b: Software with which I am familiar (*check all that apply*):	MALES, AGES					FEMALES, AGES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
Corel WordPerfect	33.33%	40.00%	0	0.00%	100.00%	52.94%	100.00%	75.00%	50.00%	0
Microsoft Word or Works	85.71%	80.00%	0	100.00%	100.00%	88.24%	100.00%	100.00%	100.00%	0
Macintosh applications	19.05%	20.00%	0	0.00%	100.00%	11.76%	0.00%	0.00%	50.00%	0
Other (please specify)	0.00%	0.00%	0	0.00%	0.00%	11.76%	0.00%	0.00%	50.00%	0

3d. Question 4: Computers in the childhood home

While the majority of students 22 and under did have computers in their homes and used them "at least occasionally," men were much more likely to have had computers (in the 18–22 age group, 86% versus 59%; in the 23–30 age group, 60% versus 20%). (See Table 4.15.) Granted, this discrepancy could be a coincidence; I have only 56 responses.

However, I will follow this phenomenon closely as I publish the questionnaire to the Web and collect more responses. If a trend favoring boys does exist, then I want to find out why and what we as composition teachers can do to help equalize the chances for our female students. As for responses in the groups age 31 and over, the majority of these students—as might be expected—did not have computers in their homes, probably because home computers were uncommon until ten or twelve years ago.

Table 4.15.

Question 4: I would describe my background in relation to computers as follows:	**MALES, AGES**					**FEMALES, AGES**				
	18-22	**23-30**	**31-40**	**41-50**	**50+**	**18-22**	**23-30**	**31-40**	**41-50**	**50+**
I did not have a computer at home when I was growing up (for whatever reason—they weren't invented yet, we didn't have the money, etc.)	4.76%	20.00%	0	0.00%	100.00%	11.76%	60.00%	75.00%	100.00%	0
I did not have a computer in my home but had access to one elsewhere	4.76%	20.00%	0	100.00%	0.00%	29.41%	20.00%	25.00%	0.00%	0
I had a computer at home when I was growing up but was not permitted to use it	4.76%	0.00%	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0
I had a computer at home and used it at least occasionally	85.71%	60.00%	0	0.00%	0.00%	58.82%	20.00%	0.00%	0.00%	0

3e. Question 5: The computer as part of the writing process

Overall, only two respondents said they "prefer to handwrite throughout the writing process, including final drafts." This result is not surprising, considering the level of computer and typing skills that respondents claimed to have; more surprising are the ages of the respondents who prefer to write by hand (one is a male 18–22, the other a female 23–30). Of respondents 31 and over, none prefers handwriting exclusively. Men 31 and over said they prefer to use a combination of handwriting and word processing, and women in that age group are divided between using a combination of tools and using the computer exclusively. (See Table 4.16.) The results clearly show that students in this sample prefer to use the computer for composition at least part of the time. Asking them

to write in longhand is akin to giving them a handicap. I predict that a similar study done in ten years will show even fewer students wishing to write in longhand.

Table 4.16.

Question 5: I would describe my use of computers for writing as follows:	MALES, AGES					FEMALES, AGES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
I prefer to handwrite throughout the writing process, including final drafts	4.76%	0.00%	0	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%	0
I prefer to handwrite throughout the writing process, but will reluctantly type any final drafts or have them typed for me	4.76%	20.00%	0	0.00%	0.00%	17.65%	0.00%	0.00%	0.00%	0
I use a combination of handwriting and typing in my writing process	38.10%	60.00%	0	100.00%	100.00%	29.41%	40.00%	25.00%	50.00%	0
I do very little or no handwriting and prefer to perform the entire writing process on computer	52.38%	20.00%	0	0.00%	0.00%	52.94%	40.00%	75.00%	50.00%	0

3f. Question 6: Level of comfort with computers

Only two respondents claimed to be "very uncomfortable with computers," and again, the surprise is in their age groups—one is a male in the 23–30 age group, and the other is a female in the 18–22 age group. Perhaps because of their maturity and because of the high level of motivation needed to be a "non-traditional" student, the respondents in the groups age 31 and up unanimously agreed that computers are a positive addition to their lives and must be part of each student's educational future. (See Table 4.17.)

Another surprising result is that five males under 30 and four females under 23 think we rely too heavily on computer technology. Why are the younger students so much more uncomfortable with computers than their older counterparts? Older students may be more willing to embrace technology; they have been around long enough to remember how difficult it was to write a paper or perform complicated mathematical functions without the help of technology. Younger students do not have the experience necessary to compare their world (with technology) with the previous (pre-technology) world. Most of them are too young to remember 2400-baud modems and tape drives, let

alone carbon paper and "white-out." They cannot imagine a world without 250-megabyte portable storage and high-speed Internet access. Older students *can* imagine it—and for the most part, responses seem to indicate, they would like to leave it behind.

Table 4.17.

Question 6: I would describe my comfort level with computer technology as follows:	**MALES, AGES**					**FEMALES, AGES**				
	18-22	**23-30**	**31-40**	**41-50**	**50+**	**18-22**	**23-30**	**31-40**	**41-50**	**50+**
I am very uncomfortable with computers and would prefer not to have to use them	0.00%	20.00%	0	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0
I am uncomfortable with computers but feel I must learn to keep up with technology	14.29%	20.00%	0	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0
I am comfortable with computers and am eager to learn more and to ensure their place in my educational future	66.67%	20.00%	0	100.00%	100.00%	64.71%	100.00%	100.00%	100.00%	0
I am comfortable with computers but do not think we should rely so heavily upon them	14.29%	40.00%	0	0.00%	0.00%	23.53%	0.00%	0.00%	0.00%	0

3g. Question 7: Familiarity with the Internet and World Wide Web

Not long ago—six years, maybe—the Internet (a system of links between computer networks all over the world) and World Wide Web (the Internet's graphical interface) were hot topics, the subjects of cover stories on seemingly every major magazine and on every television talk show and news program. People who had never used the Internet—and many people had not, at that point—were afraid of it. The growing number of people who *had* used the Internet by then had stories to tell: hours and hours in chat rooms, mailboxes stuffed with messages from lively Usenet discussion groups, memberships to "bulletin boards" in every major city and most of the smaller ones. The media quickly jumped on any sordid tale—for instance, a woman falls in love online, only to find out when she meets her "dream man" that he is nothing like his online persona; in fact, he's actually a kidnapper and rapist. The Internet was newer then, and it was frightening.

Now that most students have used the Internet—in fact, most of their parents have, too—the fear is turning to curiosity and fascination. Users see that most of the

people they meet online are just as normal as they are, and that they can generally avoid people who are likely to misrepresent themselves by avoiding certain situations (chat rooms being the best example). The Internet has grown from its humble beginnings as a link among universities; now, anyone can publish practically anything, so users have to look harder to find good information.

The responses in my sample reflect widespread interest in the Internet and World Wide Web, as well as concern that good, reliable information is sometimes hard to find. All of the respondents said they either have experience using the Internet or want to gain experience. Not surprisingly, well over half the students 18–22 said they use the Internet "extensively" for business, recreation, and school purposes, and another 40% or so have "moderate" experience with the Internet. The numbers for the 23–30 age group are similar: 60% of women and 40% of men use the Internet "extensively," with another 40% of both genders using it "moderately." All of the women over 30 have at least "moderate" experience. (See Table 4.18.) These results help explain the responses to Question 8.

Table 4.18.

Question 7: I would describe my familiarity with the Internet/World Wide Web as follows:	**MALES, AGES**					**FEMALES, AGES**				
	18-22	**23-30**	**31-40**	**41-50**	**50+**	**18-22**	**23-30**	**31-40**	**41-50**	**50+**
I have little or no experience with the Internet and do not wish to learn	0.00%	0.00%	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0
I have little or no experience and wish to learn more	4.76%	20.00%	0	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0
I have moderate experience using the Internet for mainly personal/recreational uses	23.81%	20.00%	0	0.00%	0.00%	17.65%	20.00%	50.00%	50.00%	0
I have moderate experience using the Internet for mainly scholastic uses	14.29%	20.00%	0	0.00%	100.00%	23.53%	20.00%	0.00%	0.00%	0
I use the Internet extensively for business, recreation, and school purposes	57.14%	40.00%	0	0.00%	0.00%	58.82%	60.00%	50.00%	50.00%	0

3h. Question 8: Level of satisfaction with the Internet as a tool and with quality of information on the Internet

Every respondent acknowledged at least some satisfaction with the Internet as a research tool. The majority of both males and females find the Internet "somewhat helpful" in their research; males 18–22 are more than twice as likely to rate the Internet as "somewhat helpful" as they are to say they do the "majority" of their research online and "rarely or never" cannot find what they seek. Females in the same age group were three times as likely to rate the Internet as a "somewhat helpful" research tool as they were to say it is very helpful. Results are similar in the other age groups (except in the groups that have fewer than four respondents). (See Table 4.19.)

Only one respondent claimed that information on the Internet is "basically worthless." Everyone else finds "useful and reliable" information at least some of the time, and approximately half of men 30 and under said they are "always able" to find reliable information. Women in the 18–22 age group are more conservative: All those who answered the question (94%) said the quality of information on the Internet is "spotty." Eighty percent of females 23–30 agree; however, women 31–40 think the information they find is reliable and of high quality. Women in the 41–50 age group are divided evenly between the two opinions (however, only 2 respondents fall in this age group). (See Table 4.20.)

Table 4.19.

Question 8a: I would describe my level of satisfaction with using the Internet for scholastic purposes as follows:	**MALES, AGES**					**FEMALES, AGES**				
	18-22	**23-30**	**31-40**	**41-50**	**50+**	**18-22**	**23-30**	**31-40**	**41-50**	**50+**
I do not find the Internet to be a useful tool in scholastic research	0.00%	0.00%	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0
I find the Internet to be somewhat helpful in research	66.67%	60.00%	0	0.00%	0.00%	76.47%	80.00%	50.00%	100.00%	0
I do the majority of my research online and rarely or never cannot find what I need	28.57%	40.00%	0	100.00%	100.00%	23.53%	20.00%	50.00%	0.00%	0

Table 4.20.

Question 8b: I would describe the quality of information I have found on the Internet as follows:	MALES, AGES					FEMALES, AGES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
Information I find on the Internet is basically worthless	4.76%	0.00%	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0
Spotty: sometimes useful and reliable, sometimes not, depending on source	52.38%	40.00%	0	100.00%	0.00%	94.12%	80.00%	0.00%	50.00%	0
I am always able to find reliable, high-quality information on the Internet	42.86%	60.00%	0	0.00%	100.00%	0.00%	20.00%	75.00%	50.00%	0

4. Implications for Today's Classrooms and Tomorrow's Research

A composition instructor reading this research may be compelled to ensure that female students have equal opportunities to learn and equal access to technology. Gender studies show that females use different parts of their brain than males use for creative tasks and that females are socialized differently from males in their educational choices. Note that in my sample, of the nine students over 30, seven are female. Perhaps this is because women are still more likely to put their education and career on hold in favor of family needs; thus, they are also more likely to be starting their education later in life. Until every incoming freshman has adequate computer skills to thrive in a computer-aided composition class, we teachers must be willing to offer what help we can to students needing remedial computer instruction (and if we can't give the students what they need, we should at least know where they can get help). The questionnaire clearly shows that the majority of students polled do use and are comfortable with computers and word processors; however, knowledge of this technology is by no means universal, and while we cannot hold back an entire class to help one or two technologically challenged students, we cannot leave those one or two stranded alongside the Information Superhighway, either.

Helping our students gain experience with word processors and other technology will help them succeed in our classrooms; it may also help them express their creativity more fluently. Even if using a word processor does not necessarily cause a writer to produce material that is more *creative*, it certainly will help that writer to be more *fluent*—that is, to write more. With proper training, it may also influence the writer's development and organizational skills. Writers who are comfortable with the computer,

who know their way around the software and can use it to make outlines, draw pictures and graphics, create tables of data, and more, can probably produce work that is more logical and better organized than if they work on a typewriter or by hand. Past studies focusing on word processors have stressed the "learning factor": If writers were not already familiar with the software, they tended to produce work that was shorter and less cohesive than work done by hand. Clearly, the "learning factor" is becoming less of a problem today, as the questionnaire responses show. I expect that in ten years, we will rarely see a student who is not skilled in word processor use.

As I said before, I plan to continue this research for several years. By putting the questionnaire in an online format, I can ensure that respondents answer each question (I can set up forms with fields that will prevent the user from advancing to the next question without first choosing an answer to the previous one). I can set up the forms to compile data automatically in a database, which can then be accessed by anyone curious about students' knowledge of computer technology. And if we are to be effective composition teachers, we *should* be curious.

In addition to being a teacher, though, I am also a creative writer. And as a creative writer, I want to know how the computer affects my creative process. Moreover, as an aspiring teacher of creative writing, I want to know how the computer will be a part of my students' lives and how it will affect their creative output. This small study of 68 freshman writers is just a beginning; I hope more researchers will try to find out how the computer affects our writing. If a word processor can help us develop our ideas better, if it can help us organize our thoughts, if it can just help us get more words down in less time—then it is certainly affecting our creative process. Computer word processing may

not turn Jane Doe into Jane Austen, but if it is destined to become part of our lives anyway, then we should use this technology to its full potential—just as we try to learn and use our own skills and talents to their full potential.

As discussed in Section 1, computers are more than just efficient writing tools. Computers are *fun.* As they become a permanent part of our lives, and as we become more familiar with their capabilities, we learn how to do more than just type papers and correct spelling. We learn how to add visual elements to our text; we learn how to add music, movies, and interactive elements that draw our readers into the text. Playing with computers not only engages us in our task but also helps us to engage our readers. Add the Internet and World Wide Web to the creative process, and we gain the ability to share our work with the whole world.

Of course, the fun of computers can be as much a detriment to the creative process as it can be a catalyst. If we allow ourselves to become too focused on aspects other than the text—if we shift the balance away from quality work toward decoration and fun—we perhaps trade good work for color and music. And if we don't take the time to learn where to find reliable information on the Internet, opting instead for the quick answers offered by search engines, then we may trade good research for worthless garbage. Computer technology can benefit writers or it can harm us, depending on our willingness to learn to use it properly.

The best creative writers today are creative no matter what tools they use; of course, many of them choose the word processor. For ease of editing, for electronic submissions, for Spell-Check, for myriad reasons, writers today choose word processors over typewriters or pen and paper. Students choose word processors for many of the same

reasons. Why not help them get the most out of their writing experience by giving them the training they need and encouraging them to have fun? Their writing will likely improve as a result.

TECHNOLOGY IN THE CLASSROOM QUESTIONNAIRE

Please read the following questions carefully and answer them honestly. Do not include your name on this survey.

My age: _____ My gender: Male ☐ Female ☐

1. I would describe my experience level in computer use as follows (choose only one answer):

☐ I am a novice computer user
☐ I have limited computer experience
☐ I have taken at least one class in which computers were used
☐ I have taken several classes in which computers were used, *and/or* I have extensive computer experience from using a home computer
☐ I am an expert computer user

2. I would describe my keyboarding (typing) skills as follows (choose only one answer):

☐ I cannot type at all
☐ I have limited typing skills
☐ I have taken a typing class or have otherwise developed good typing skills
☐ I have taken extensive keyboarding classes, *and/or* I have typed a majority of my schoolwork
☐ I work or have worked at a job requiring typing speeds of 12,000 kph or 60 wpm or more, or have equivalent typing/keyboarding skill

3a. I would describe my familiarity with word processing software as follows (choose only one answer):

☐ I am not at all familiar with word processing software
☐ I have limited experience with w.p. software
☐ I have taken a class in a w.p. application or have equivalent experience/ knowledge
☐ I have taken several classes in multiple w.p. applications or have equivalent experience/ knowledge
☐ I am an expert w.p. user

3b. Software with which I am familiar (check all that apply):

☐ WordPerfect
☐ Microsoft Word or Works
☐ Macintosh applications
☐ Other (please specify) _____

4. I would describe my background in relation to computers as follows (choose only one answer):

☐ I did not have a computer at home when I was growing up (for whatever reason—they weren't invented yet, we didn't have the money, etc.)
☐ I did not have a computer in my home but had access to one elsewhere
☐ I had a computer at home when I was growing up but was not permitted to use it
☐ I had a computer at home and used it at least occasionally

5. I would describe my use of computers for writing as follows (choose only one answer):

☐ I prefer to handwrite throughout the writing process, including final drafts
☐ I prefer to handwrite throughout the writing process, but will reluctantly type any final drafts or have them typed for me
☐ I use a combination of handwriting and typing in my writing process
☐ I do very little or no handwriting and prefer to perform the entire writing process on computer

6. I would describe my comfort level with computer technology as follows (choose only one answer):

☐ I am very uncomfortable with computers and would prefer not to have to use them
☐ I am uncomfortable with computers but feel I must learn to keep up with technology
☐ I am comfortable with computers and am eager to learn more and to ensure their place in my educational future
☐ I am comfortable with computers but do not think we should rely so heavily upon them

7. I would describe my familiarity with the Internet/World Wide Web as follows (choose only one answer):

- ☐ I have little or no experience with the Internet and do not wish to learn
- ☐ I have little or no experience and wish to learn more
- ☐ I have moderate experience using the Internet for mainly personal/recreational uses
- ☐ I have moderate experience using the Internet for mainly scholastic uses
- ☐ I use the Internet extensively for business, recreation, and school purposes

8a. I would describe my level of satisfaction with using the Internet for scholastic purposes as follows (choose only one answer):

- ☐ I do not find the Internet to be a useful tool in scholastic research
- ☐ I find the Internet to be somewhat helpful in research
- ☐ I do the majority of my research online and rarely or never cannot find what I need

8b. I would describe the quality of information I have found on the Internet as follows (choose only one answer):

- ☐ Information I find on the Internet is basically worthless
- ☐ Spotty: sometimes useful and reliable, sometimes not, depending on source
- ☐ I am always able to find reliable, high-quality information on the Internet

Please add any comments on the above questions in this space. Number your comments to correspond with the question to which they refer. Thank you!

"TECHNOLOGY IN THE CLASSROOM" RESPONSES LISTED BY GENDER

Question 1: I would describe my experience level in computer use as follows:

	ALL MALES		ALL FEMALES	
I am a novice computer user	5	17.86%	0	0.00%
I have limited computer experience	4	14.29%	9	32.14%
I have taken at least one class in which computers were used	4	14.29%	3	10.71%
I have taken several classes in which computers were used, and/or I have extensive computer experience from using a home computer	11	39.29%	15	53.57%
I am an expert computer user	3	10.71%	1	3.57%
Respondents	*27*		*28*	

Question 2: I would describe my keyboarding (typing) skills as follows:

	ALL MALES		ALL FEMALES	
I cannot type at all	0	0.00%	1	3.57%
I have limited typing skills	10	35.71%	6	21.43%
I have taken a typing class or have otherwise developed good typing skills	8	28.57%	11	39.29%
I have taken extensive keyboarding classes, and/or I have typed a majority of my schoolwork	9	32.14%	6	21.43%
I work or have worked at a job requiring typing speeds of 12,000 kph or 60 wpm or more, or have equivalent typing/keyboarding skill	1	3.57%	4	14.29%
Respondents	*28*		*28*	

Question 3a: I would describe my familiarity with word processing software as follows:

	ALL MALES		ALL FEMALES	
I am not at all familiar with word processing software	1	3.57%	1	3.57%
I have limited experience with wp software	9	32.14%	8	28.57%
I have taken a class in a wp application or have equivalent experience/knowledge	5	17.86%	13	46.43%
I have taken several classes in multiple wp applications or have equivalent experience/knowledge	9	32.14%	6	21.43%
I am an expert wp user	4	14.29%	0	0.00%
Respondents	*28*		*28*	

Question 3b: Software with which I am familiar (check all that apply):

	ALL MALES		ALL FEMALES	
Corel WordPerfect	10	35.71%	18	64.29%
Microsoft Word or Works	24	85.71%	26	92.86%
Macintosh applications	6	21.43%	3	10.71%
Other (please specify)	0	0.00%	3	10.71%
Responses	*40*		*50*	

Note: *Because respondents could choose more than one response to this question, total responses are greater than totals for the other questions.*

Question 4: I would describe my background in relation to computers as follows:

	ALL MALES		ALL FEMALES	
I did not have a computer at home when I was growing up (for whatever reason--they weren't invented yet, we didn't have the money, etc.)	3	10.71%	10	35.71%
I did not have a computer in my home but had access to one elsewhere	3	10.71%	7	25.00%
I had a computer at home when I was growing up but was not permitted to use it	1	3.57%	0	0.00%
I had a computer at home and used it at least occasionally	21	75.00%	11	39.29%
Respondents	*28*		*28*	

Question 5: I would describe my use of computers for writing as follows:

	ALL MALES		ALL FEMALES	
I prefer to handwrite throughout the writing process, including final drafts	1	3.57%	1	3.57%
I prefer to handwrite throughout the writing process, but will reluctantly type any final drafts or have them typed for me	2	7.14%	3	10.71%
I use a combination of handwriting and typing in my writing process	13	46.43%	9	32.14%
I do very little or no handwriting and prefer to perform the entire writing process on computer	12	42.86%	15	53.57%
Respondents	*28*		*28*	

Question 6: I would describe my comfort level with computer technology as follows:

	ALL MALES		ALL FEMALES	
I am very uncomfortable with computers and would prefer not to have to use them	1	3.57%	1	3.57%
I am uncomfortable with computers but feel I must learn to keep up with technology	4	14.29%	1	3.57%
I am comfortable with computers and am eager to learn more and to ensure their place in my educational future	17	60.71%	22	78.57%
I am comfortable with computers but do not think we should rely so heavily upon them	5	17.86%	4	14.29%
Respondents	*27*		*28*	

Question 7: I would describe my familiarity with the Internet/World Wide Web as follows:

	ALL MALES		ALL FEMALES	
I have little or no experience with the Internet and do not wish to learn	0	0.00%	0	0.00%
I have little or no experience and wish to learn more	3	10.71%	0	0.00%
I have moderate experience using the Internet for mainly personal/recreational uses	6	21.43%	7	25.00%
I have moderate experience using the Internet for mainly scholastic uses	5	17.86%	5	17.86%
I use the Internet extensively for business, recreation, and school purposes	14	50.00%	16	57.14%
Respondents	*28*		*28*	

Question 8a: I would describe my level of satisfaction with using the Internet for scholastic purposes as follows:

	ALL MALES		ALL FEMALES	
I do not find the Internet to be a useful tool in scholastic research	1	3.57%	0	0.00%
I find the Internet to be somewhat helpful in research	17	60.71%	21	75.00%
I do the majority of my research online and rarely or never cannot find what I need	9	32.14%	7	25.00%
Respondents	*27*		*28*	

Question 8b: I would describe the quality of information I have found on the Internet as follows:

	ALL MALES		ALL FEMALES	
Information I find on the Internet is basically worthless	1	3.57%	0	0.00%
Spotty: sometimes useful and reliable, sometimes not, depending on source	14	50.00%	21	75.00%
I am always able to find reliable, high-quality information on the Internet	13	46.43%	5	17.86%
Respondents	*28*		*26*	

Note: Where number of respondents does not add up to 28 in either gender, one or more respondents failed to answer a question. Where percentages do not add up to 100%, the same is true; in cases in which the discrepancy is less than a percentage point, however, the discrepancy is due to decimal rounding.

"TECHNOLOGY IN THE CLASSROOM" RESPONSES LISTED BY AGE GROUP

Question 1: I would describe my experience level in computer use as follows:

	MALES					FEMALES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
I am a novice computer user	9.52%	40.00%	0	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0
I have limited computer experience	19.05%	0.00%	0	0.00%	0.00%	29.41%	40.00%	50.00%	0.00%	0
I have taken at least one class in which computers were used	9.52%	20.00%	0	0.00%	100.00%	11.76%	0.00%	25.00%	0.00%	0
I have taken several classes in which computers were used, and/or I have extensive computer experience from using a home computer	47.62%	20.00%	0	0.00%	0.00%	52.94%	60.00%	25.00%	100.00%	0
I am an expert computer user	14.29%	0.00%	0	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0

Question 2: I would describe my keyboarding (typing) skills as follows:

	MALES					FEMALES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
I cannot type at all	0.00%	0.00%	0	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0
I have limited typing skills	28.57%	40.00%	0	100.00%	100.00%	23.53%	20.00%	25.00%	0.00%	0
I have taken a typing class or have otherwise developed good typing skills	33.33%	20.00%	0	0.00%	0.00%	35.29%	60.00%	0.00%	100.00%	0
I have taken extensive keyboarding classes, and/or I have typed a majority of my schoolwork	33.33%	40.00%	0	0.00%	0.00%	29.41%	20.00%	0.00%	0.00%	0
I work or have worked at a job requiring typing speeds of 12,000 kph or 60 wpm or more, or have equivalent typing/keyboarding skill	4.76%	0.00%	0	0.00%	0.00%	11.76%	0.00%	50.00%	0.00%	0

Question 3a: I would describe my familiarity with word processing software as follows:

	MALES					FEMALES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
I am not at all familiar with word processing software	0.00%	20.00%	0	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%	0
I have limited experience with wp software	23.81%	40.00%	0	100.00%	100.00%	23.53%	40.00%	50.00%	0.00%	0
I have taken a class in a wp application or have equivalent experience/knowledge	23.81%	0.00%	0	0.00%	0.00%	58.82%	0.00%	25.00%	100.00%	0
I have taken several classes in multiple wp applications or have equivalent experience/knowledge	33.33%	40.00%	0	0.00%	0.00%	17.65%	40.00%	25.00%	0.00%	0
I am an expert wp user	19.05%	0.00%	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0

Question 3b: Software with which I am familiar (check all that apply):

	MALES					FEMALES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
Corel WordPerfect	33.33%	40.00%	0	0.00%	100.00%	52.94%	100.00%	75.00%	50.00%	0
Microsoft Word or Works	85.71%	80.00%	0	100.00%	100.00%	88.24%	100.00%	100.00%	100.00%	0
Macintosh applications	19.05%	20.00%	0	0.00%	100.00%	11.76%	0.00%	0.00%	50.00%	0
Other (please specify)	0.00%	0.00%	0	0.00%	0.00%	11.76%	0.00%	0.00%	50.00%	0
Number of respondents in each category:	21	5	0	1	1	17	5	4	2	0

Question 4: I would describe my background in relation to computers as follows:

	MALES					FEMALES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
I did not have a computer at home when I was growing up (for whatever reason--they weren't invented yet, we didn't have the money, etc.)	4.76%	20.00%	0	0.00%	100.00%	11.76%	60.00%	75.00%	100.00%	0
I did not have a computer in my home but had access to one elsewhere	4.76%	20.00%	0	100.00%	0.00%	29.41%	20.00%	25.00%	0.00%	0
I had a computer at home when I was growing up but was not permitted to use it	4.76%	0.00%	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0
I had a computer at home and used it at least occasionally	85.71%	60.00%	0	0.00%	0.00%	58.82%	20.00%	0.00%	0.00%	0

Question 5: I would describe my use of computers for writing as follows:

	MALES					FEMALES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
I prefer to handwrite throughout the writing process, including final drafts	4.76%	0.00%	0	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%	0
I prefer to handwrite throughout the writing process, but will reluctantly type any final drafts or have them typed for me	4.76%	20.00%	0	0.00%	0.00%	17.65%	0.00%	0.00%	0.00%	0
I use a combination of handwriting and typing in my writing process	38.10%	60.00%	0	100.00%	100.00%	29.41%	40.00%	25.00%	50.00%	0
I do very little or no handwriting and prefer to perform the entire writing process on computer	52.38%	20.00%	0	0.00%	0.00%	52.94%	40.00%	75.00%	50.00%	0

Question 6: I would describe my comfort level with computer technology as follows:

	MALES					FEMALES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
I am very uncomfortable with computers and would prefer not to have to use them	0.00%	20.00%	0	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0
I am uncomfortable with computers but feel I must learn to keep up with technology	14.29%	20.00%	0	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0
I am comfortable with computers and am eager to learn more and to ensure their place in my educational future	66.67%	20.00%	0	100.00%	100.00%	64.71%	100.00%	100.00%	100.00%	0
I am comfortable with computers but do not think we should rely so heavily upon them	14.29%	40.00%	0	0.00%	0.00%	23.53%	0.00%	0.00%	0.00%	0

Question 7: I would describe my familiarity with the Internet/World Wide Web as follows:

	MALES					FEMALES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
I have little or no experience with the Internet and do not wish to learn	0.00%	0.00%	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0
I have little or no experience and wish to learn more	4.76%	20.00%	0	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0
I have moderate experience using the Internet for mainly personal/recreational uses	23.81%	20.00%	0	0.00%	0.00%	17.65%	20.00%	50.00%	50.00%	0
I have moderate experience using the Internet for mainly scholastic uses	14.29%	20.00%	0	0.00%	100.00%	23.53%	20.00%	0.00%	0.00%	0
I use the Internet extensively for business, recreation, and school purposes	57.14%	40.00%	0	0.00%	0.00%	58.82%	60.00%	50.00%	50.00%	0
Number of respondents in each category:	21	5	0	1	1	17	5	4	2	0

Question 8a: I would describe my level of satisfaction with using the Internet for scholastic purposes as follows:

	MALES					FEMALES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
I do not find the Internet to be a useful tool in scholastic research	0.00%	0.00%	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0
I find the Internet to be somewhat helpful in research	66.67%	60.00%	0	0.00%	0.00%	76.47%	80.00%	50.00%	100.00%	0
I do the majority of my research online and rarely or never cannot find what I need	28.57%	40.00%	0	100.00%	100.00%	23.53%	20.00%	50.00%	0.00%	0

Question 8b: I would describe the quality of information I have found on the Internet as follows:

	MALES					FEMALES				
	18-22	23-30	31-40	41-50	50+	18-22	23-30	31-40	41-50	50+
Information I find on the Internet is basically worthless	4.76%	0.00%	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0
Spotty: sometimes useful and reliable, sometimes not, depending on source	52.38%	40.00%	0	100.00%	0.00%	94.12%	80.00%	0.00%	50.00%	0
I am always able to find reliable, high-quality information on the Internet	42.86%	60.00%	0	0.00%	100.00%	0.00%	20.00%	75.00%	50.00%	0
Number of respondents in each category:	21	5	0	1	1	17	5	4	2	0

Note: Where percentages do not add up to 100%, one or more subjects did not respond to the question.

STATEMENT OF INFORMED CONSENT

Please read carefully and sign the appropriate section of this form (do not sign both!). A copy will be provided to you upon request. If you have any questions, feel free to ask. Thank you.

A. Consent to Participate in Research

By signing below, I acknowledge

1) that I have been informed of my participation in a research project involving approximately 75–100 students, who will each supply a writing sample that will be used to study the effects of computer use on composition;
2) that I consent to participate in such research, realizing that there is in this research virtually no risk or minimal risk to me;
3) that any identifying information I give to the researcher(s) will not be used in conjunction with the products of my participation in this research, and that **my confidentiality will be assured**;
4) that the results of this research may be made available to me at my request, by contacting my English 1550 instructor;
5) that my participation in this research is entirely voluntary;
6) that the results of this research may be beneficial in the future design of computer-based composition courses;
7) that I am age 18 or over;
8) and that nothing in the above statement of consent is intended to preempt any applicable Federal, State, or local laws.

_____ _____

Participant's Signature Date

Direct Any Questions to Principal Investigator: Holly M. Wells, Graduate Student, English
298 DeBartolo Hall, Youngstown State University (330) 742-4627
or to Advisor: Bege K. Bowers, Ph.D., Professor of English, 224 DeBartolo Hall (330) 742-1655

B. Refusal to Participate in Research

By signing below, I acknowledge my decision **not to participate** in the research as outlined above. I understand that my refusal to participate will involve no penalty or loss of benefits to which I would otherwise be entitled.

_____ _____

Participant's Signature Date

_____ _____

Witness's Signature *(for Consent or Refusal)* Date

NARRATIVE ESSAY

Directions: *Read through the topic printed below and write a narrative (story) in response. You will have 40 minutes to write, so use your allotted time wisely. In the area provided below, please write any brainstorming, outlining, etc., that you do before beginning to write your story. Then, in the section labeled "Narrative," write your story. Please write as legibly as possible. If you do any editing, DO NOT OBLITERATE (by erasing or scratching out) the text being changed; simply ~~put a line through it~~, so that it remains legible.*

When the allotted time has expired, the instructor will notify you to finish the sentence you are working on. Please do so promptly. When you have finished, give your essay to the instructor. You will then be asked to sign a short consent form acknowledging that you are consenting to take part in this study.

Please have fun with this assignment!

Please enter your name and age:

Name: _____ **Age:** _____

Topic

Write a narrative about the following: *One morning, you (or your main character) awaken to discover that humankind has developed—or been given—the ability to become invisible at will.*

You may write your narrative in any format or style you wish to use.

Brainstorming Area

Use this area to list ideas, brainstorm, outline, or use any other technique you find helpful for organization of ideas. You are not required to brainstorm; this space is provided for your convenience should you wish to do so.

Narrative

Use this area to write your story. If you need more paper, please ask your instructor.

Once again, thank you for participating in this study.

NARRATIVE ESSAY

Directions: *Read through the topic printed below and write a narrative (story) in response. You will have 40 minutes to write, so use your allotted time wisely. (Do not worry if you do not consider yourself a fast typist.) In the area provided below, please type and save any brainstorming, outlining, etc., that you do before beginning to write your story. Then, in the section labeled "Narrative," write your story.*

When the allotted time has expired, the instructor will notify you to finish the sentence you are working on and click "Save." Be sure that you have saved the document to the 3½" floppy drive ("A") and not to the hard drive ("C" or "D"). When instructed to do so, please print out two (2) copies of your narrative and give them to your instructor. You will then be asked to sign a short consent form acknowledging that you are consenting to take part in this study.

Please have fun with this assignment!

Please click on the grey box to enter your name and age:
Name: Age:

Topic
Write a narrative about the following: *One morning, you (or your main character) awaken to discover that humankind has developed—or been given—the ability to become invisible at will.*

In the Brainstorming area, you may wish to think out the implications of this idea before deciding what to write about. You may write your narrative in any format or style you wish to use.

Brainstorming Area
Click on the grey box below to enter text. Use this area to list ideas, brainstorm, outline, or use any other technique you find helpful for organization of ideas. **Do not delete your brainstorming!**

Narrative
Use this area to write your story. Click on the grey box below to enter text. Text will overflow onto additional pages as needed.

Once again, thank you for participating in this study. Please remember to **SAVE your document!**

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March 22, 2001

Dr. Bege Bowers, Professor
Ms. Holly M. Wells, Graduate Student
Department of English
CAMPUS

RE: HSRC Protocol #35-01

Dear Dr.Bowers and Ms. Wells:

The Human Subjects Research Committee of Youngstown State University has reviewed your protocol, "The Effects of Computer Word Processor Use on Creative Process in Freshman Composition," (HSRC #35-01). Based on the information provided, the above protocol was determined to be exempt from full committee review under U.S. DHHS Category 1 exemption.

The Committee would like to remind the Principal Investigator to ensure all participants of the project are over 18.

Any changes in your research activity should be promptly reported to the Human Subjects Research Committee and may not be initiated without HSRC approval except where necessary to eliminate hazard to human subjects. Any unanticipated problems involving risks to subjects should also be promptly reported to the Human Subjects Research Committee.

The HSRC would like to extend its best wishes to you in the conduct of this study.

Sincerely,

Peter J. Kasvinsky
Dean, School of Graduate Studies
Research Compliance Officer

PJK/cc