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A SURVEY MEASURING PERCEPTIONS OF TENTH GRADE ENGLISH STUDENTS AT THOMAS JEFFERSON HIGH SCHOOL TOWARD THE USE OF COMPUTERS IN WRITING FOR APPLIED ORAL COMMUNICATIONS

A Thesis

Presented to the

Department of Teacher Education

and the

Faculty of the Graduate College

University of Nebraska

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

University Of Nebraska at Omaha

by

Angela Ankenbauer

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Abstract

A Survey Measuring Perceptions of Tenth Grade English Students at

Thomas Jefferson High School Toward the Use of Computers

in Writing for Applied Oral Communications

The purpose of this study was to measure the perceptions of tenth grade English students at Thomas Jefferson High School who use computers in writing for applied oral communications. Does the use of technology provide measurable results on tenth grade English students who use computers in writing for oral communications? The study used approximately 100 (four sections, computer-assigned) tenth grade language arts, untracked students which were scheduled for a one semester class (18 weeks). Students were assigned to one teacher. The four sections were taught applied oral communications using computer assisted instruction and computers to produce final written documents. Measurement and documentation was taken from all groups in the form of a pre test survey which described students' perceptions at the beginning of an eight week period towards computer applications in the areas of essay composing, research, speech writing, and editing for a final draft. A post test survey was given to measure changes in students' perceptions after eight weeks of computer assisted instruction in the areas of essay composing, research, speech writing and editing for a final draft document. Teacher observations through journaling (by the teacher) generated documentation which cultivated underlying useful data. The hypothesis investigated was; technology does affect students'

perceptions which can extend learning experiences and opportunities. The change in perceptions provided conditions which enabled students to formulate and construct their own understanding from observable facts to clear concise conclusions which could be interactively (computer generated) communicated through the written composition and speech.

ACKNOWLEDGEMENTS

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CHAPTER ONE

Introduction

Today's students may be uncertain of change; especially change which includes technology. Learning technology may not be a reality for all classrooms for many valid reasons. Because of extraordinary costs, extensive training, and resistance (to any change in the status quo) many schools have chosen not to endorse technology and outwardly deny the responsibility to students. Numerous classrooms are still teacher centered. Roles are not changing. In many cases, this lack of change is because teachers often do not have a vision of life in the approaching century. Teacher attitudes can and do affect student attitudes. "Success in learning may well depend upon a teacher's appropriate diagnosis and consideration of specific skill needs exhibited by students, followed by appropriate instruction" (Estes & Vaughan, 1978, p 36). What the teacher teaches or the methods used to teach the curriculum is still a teacher's prerogative.

In contrast, Kohlberg and Mayer (1972) make the argument (against teacher centered instruction) that the most important aim of education is the development of the child" (Estes & Vaughan, 1978, p.37). The child's personal experiences and discoveries determine attitude; respectably, attitudes and perceptions can determine success. "Fostering intellectual and personal growth is best accomplished by allowing the learner the chance to interact with the learning environment while perceiving help and guidance of the kind he or she needs" (Estes & Vaughan, 1978, p.37).

Outside the classroom, society wants today's student to graduate from public school; ready to assimilate into society in a positive way. Worldwide communication is more sophisticated than ever; yet, textbooks and a lecture may be the only methods utilized in many schools. Preparing students to communicate after graduation frequently requires the same tools necessary to communicate inside schools as it does outside schools. Educators in some districts have made the connection acknowledging the validity between integrating and using technology in the classroom to improve communication. "Harvard psychologist Howard Gardner witnesses that a student who doesn't grasp concepts well by reading them in a book may be more likely to understand them using a computer that aids in visualization" (Watts, 1997, p. 56). New London's Connecticut College campus has "taken faculty and students beyond routine e-mail and word processing to on-line resources including distant data images, and access to archival material" (Watts, 1997, p. 56). The concern for the present impact of technology on learning is forefront among the numerous issues facing educators. The perceptions students have toward the integration of technology into the classroom learning process in the area of writing for applied oral communication is the focus of this study.

Background of the Problem

Due to scarce or unwise uses of resources and often technology-apprehension, educators have not been able to make technology as available to staff members and students as necessary. If this belief remains constant "we will be condemning our students to the world of the uninformed" (Walker, 1997, p. 47). The turning of the 20th century

is clearly a benchmark in history where worldwide communication has increased, upsetting stalwart formidable teaching methods. The reluctance to change by some educators is not necessarily a problem; but should be seen as tenacious vigilance to hold on to what is comfortable and secure. However, the commitment to prepare students to survive in an increasingly electronic communication age must override these egos and make way for the transition which will change their lives.

Parents, educators, school districts, and the United States government have acknowledged the importance of computers in the classroom. Considerable money is being dedicated for vocational and mainstream classrooms to equip buildings with the latest technology. Teacher-training and an equitable distribution of technology may depend on the funding by the U.S. government and the business community. "Most urban districts currently receive funding for a majority of their technology initiatives from federal funds, special grants, such as Star Schools and Challenger Grants" (Walker, 1997, p. 49).

Educators and parents have made history this past decade discussing what and how schools should teach. "Teachers must be able to present content material in a fascinating, colorful, and in many ways a sensory adventure for the student. This is the mode of learning for the student of the 1990's. Learning must be made an experience from which to develop academically and analytically" (Walker, 1997, p. 47). Learning technology in the area of composing and constructing applied writing projects can begin with basic computer skills. Shaping and molding word processing tools to suit the task is every teacher's homework

assignment. The writing tools of the 21st century are electronic which require a restructuring of the entire school delivery system.

Statement of the Problem

When a child learns to speak at home, write their ABC's, and listen in the primary grades, the teacher employs more than printed words on the page. At the Howard High School of Technology, "Researchers involved in projects in Rochester, New York, and Madison, Wisconsin look at methods for assessing student learning in settings where students are involved in designing multimedia presentations for real audiences" (Weiss, 1994, p. 34). Relying on verbal instruction and textbooks the teacher utilizes a limited source. The question of this research is: does a tenth grader's perception toward the use of computers in writing for applied communications measurably change once computers are introduced into the curriculum?

Purpose of the Study

The purpose of this study was to survey the perceptions of tenth grade students who used technology-integrated writing and editing curriculum in an applied oral communications class. Pre and post tests were conducted to discover measurable change in perceptions when given computer assisted instruction and the use of computers over an eight week period.

Definition of Terms

"A Survey Measuring Perceptions of Tenth Grade English Students at Thomas Jefferson High School Toward the Use of Computers in Writing for Applied Oral Communications" can be explained and defined. In this study, the computers used served as a catalyst to

promote a change in student perceptions toward the traditional learning environment. The definitions of terms are as follows:

A Survey Measured students' perceptions using 23 questions in the format of R.S. Likert (1932). The Likert scale was given to students in the form of a pre and post test eight weeks apart. (See Appendix A)

Tenth Grade English Students included tenth grade students enrolled in a non-leveled, required language arts course with no prerequisite requirements.

Perceptions are a state of mind, or a feeling which can compel a child to learn or inhibit the learning process.

Computer Use included: word-processing computers, Internet, CD-rom, and production equipment. Computer technology was an integrated part of the curriculum.

Writing for Applied Oral Communications was described through student pre and post testing. Technology integrated curriculum provided the individual student's personal discovery of the meaning of reality-based information and as the act of sharing or imparting thoughts, opinions, or information through applied speech and writing.

Hypothesis

Tenth grade students who are exposed to technology which included: Internet, CD-rom, word processing, and editing software will significantly change their perceptions toward writing and editing for applied oral communications as measured by the Tenth Grade Applied Oral Communications Survey. The change in perception is an opportunity which may enable these students to formulate and

construct their own understanding from observable facts to clear concise conclusions which may improve their communication.

Assumptions, Limitations and Delimitations

Assumptions: In this survey it was assumed all students and parents will:

1. Comply with the course content.
2. Participate in computer-based listening, writing, and speaking activities.

Limitations: The researcher realized computer experience varies from being very experienced to being intimidated. Access to computer labs may have been difficult and required students to do work outside of class-time, during study halls, regular school hours, and at home.

Delimitations: The subjects, mainstreamed tenth graders, (special needs students were included) were required to have the English credit to graduate. Less than 30 percent of those students surveyed will pursue college or any post-high school education. The generalizations about student performance may be difficult given data is based on a survey compiled from student perceptions. Over the eight week period 17 students were dropped from the program of study and did not take the post test.

Importance of this Study

In recent years, educators had little doubt that information technology had the potential to enhance teaching and learning; however, educators continue to heavily debate how technology should be used to boost academic productivity (Massy & Zemsky, 1995). The question is, "exactly what does a technology infrastructure look like?" Where is the

compelling, driving purpose to guarantee practical, applicable, and innovative technology? Also, the cost, staffing, training, and impact on higher education's goals and objectives are significant extra-topical issues pending unanswered.

Educom, a pioneer in facilitating information technology applications and organizer of the recently launched National Learning Infrastructure Initiative, reported a pair of observations (Massy & Zemsky, 1995). First, the demand for information technology will grow substantially over the next decade. Educom noted that technology-based education is more economical and accessible to K-12 education than the cost of a post-secondary situation. Secondly, information technology will change teaching and learning profoundly (Massy & Zemsky, 1995). Innovators of technology have introduced technology into the lives of educators and students. Consequently, the need to define the role of electronic learning and validate its usefulness and productiveness has never been more evident. Capitalizing on the advantages has created discussion, but most would agree that informational technology provides an infinite amount of information compared to the finite binding of a textbook (Quesada, 1996). "Technology allows a faculty to accommodate individual differences in student goals, learning styles and abilities, while providing improved convenience for both students and faculty on an 'any time and any place' basis" (Massy & Zemsky, 1995). Does the quantity and tailoring of curriculum justify the high costs to implement technology? Do we put all our eggs in the 'technology basket'? Can the traditional educational paradigm stand up next to today's students' work with advancing technologies and the teacher's knowledge base? There

are inherent difficulties implementing technology; however, weighing the untold advantages of such tools as the Internet, on-line databases, and educational software the problems should be solved.

Instructional technology tacitly and rather intuitively engages self-paced learning; paying close attention to learning styles and continual performance assessment. Time management and repetition no longer need to be the sole responsibility of the teacher. Restructuring the traditional classroom giving more focus on making ownership and outcome based performance the goal of the student. Consistent assessment leads to hard data; therefore, evidence of productivity. From an informal survey, educators are increasingly taking advantage of advanced technologies: test writers and grade books are among the first tools to analyze achievement and create a variety of reports (Brooks, 1996, p. 27).

An instructional technology based curriculum can stimulate and increase performance in the areas of speaking, writing, and listening. In the state of New Jersey, distance learning is now in its seventh year of use. Bell Atlantic's Interactive Distance Learning Service offers this state's educators and students resources and cultural experiences that might not be available locally" (Van Horn, 1996, p. 260). The technology use is not just for student use of microcomputers, but for other forms of technology including: satellite broadcasting, online services, and cable television.

The current perceptions need to be about students and about teachers; how they are using technology and how it is changing the ways teachers teach and the ways students learn. The data collected reflected

how technology is impacting the schools and children. The descriptive observations and effects of technology-integrated curriculum which enhances, refines, and broadens the ability to increase learning while satisfying many other learning objectives may be as vital as the statistical data reflected from a pre and post test survey of student perceptions.

CHAPTER TWO

Review of Relevant Literature

The purpose of this chapter was to provide an investigative inquiry into the area of student perceptions towards computer technology which probed current trends, contemporary methodology, and modern pedagogy. To give direction to this study critical focus targeted three areas of investigation:

1). learning theories related to the hypothesis,

2). research on computer assisted instruction, and

3). research on cognitive and metacognitive structures.

Learning Theories Related to the Hypothesis

New research identified supporting student perceptions of technology can and does extend learning experiences in the area of communication. Research also must look at both student engagement and interaction, and the teacher's and student's experiences and curriculum. Research must address and ask difficult technology questions which have no easy answers or quick solutions. The analysis of the data allowed for comparisons of student perceptions towards learning technology.

Understanding how students learn was critical to making decisions regarding what is taught in the classroom, as well as how it is taught. Howard Gardner has developed a theory of multiple intelligences. He has suggested there are different kinds of intelligences which can be grouped into seven areas. The student learns through each of these seven areas, or intelligences. The differences between individuals lies in the, "strength of a student's intelligences" (Oliver, 1997, p. 62). As learners

mature so will the intelligences and classroom opportunities. Gardner identifies "secondary students are often excited about the possibilities opened to them as they learn to use their various intelligences" (Oliver, 1997,p. 63). What educators can ultimately understand about multiple intelligences is that "students have different strengths and interests and that they need to actively participate in their own learning" (p. 62).

Research articulates six assumptions or propositions, (about how students learn) that have critical implication for instruction (Jones, Palincsar, Ogle, and Carr, 1987). The six assumptions about learning are reflected in the following by L.B. Resnick (1984):

Learning is: 1). goal oriented

2). the linking of new information to prior knowledge

3). the organization of information

4). the acquisition of cognitive and metacognitive structures

5). nonlinear yet occurs in phases

6). influenced by cognitive development (p.303).

Designing technology which encompassed the six assumptions about learning may be included in most all educational software. However, the application of that software is in the hands of the educators and learners. Skilled learners strive to reach two goals: to understand the meaning of the tasks at hand, often referred to as constructing meaning, and to regulate their own learning by being independent learners (Resnick, 1984). This two-part theory comes both from research on cognition and from research on metacognition.

Technology entreats the learner to use the machinery to gain or acquire knowledge. Integrating the technology into performance based

outcomes the student thinks about how to control and apply the technology to allow his or her labors to come to fruition. The reality of defining the overall impact of telecommunication is based on two premises: "The computer is the fundamental information and communications appliance of our time", and "Telecommunications speed will increase dramatically" (Dyrli & Kinnaman, 1996). The technological exploration and metacognitive application of the teacher's and student's imagination will inevitably reshape the curriculum, school policy, and the future of education.

<u>Research on Computer Assisted Instruction</u>

For the last two decades researchers have been able to gather data and testimonials from classrooms which have integrated technology into the curriculum. The studies showed technology in schools builds on the combined benefits that both technology and student collaboration can bring to learning an open-ended interaction that promotes problem-solving and critical thinking for all students (Strommen, 1995, p. 25). More than 60 percent of a group of students at a Bronx, New York, high school reported they learn when they can explain their work and ideas to others or when they can successfully teach others difficult concepts or content. The remainder of the group reported they know they have learned when they are able to apply the knowledge to new problems or situations, or when they can create physical projects that actually work. An overwhelming 75 percent expressed a preference for presentations, roundtables, journals over tests, written reports, and interviews (Bennett, 1996, p. 16).

The National Council for Accreditation of Teacher Education recently "recommended that every teacher be trained in technology, regardless of his or her content area or grade level" (Dexter, 1996, p. 17). The International Society for Technology in Education prepared a list of standards. Among the five sub-headings: entry-level, progressive-level, proficient-level and exemplary-level skills, thirteen areas of focus were described. The National Council for Accreditation of Teacher Education standards reflected the belief that technology and learning must be linked in order for there to be effective integration of technology into teaching methods and content areas (Dexter, 1996, p. 18).

Yet another study, by a group of educators at Brewster Academy in Wolfeboro, New Hampshire, compared the technological growth of males and females in and out of computer assisted instruction. The findings reflected the "females who were in the program outperformed males who were not" (Bain, 1996, p. 73). Also mentioned was an encouraging narrowing of the gender difference in skill level of students with the computer assisted instruction. It is possible one could conclude that over time the gender differences which now exist may diminish because technology was able to level the playing field. Technology can then be inferred to actually change the perceptions and behavior of students and possibly teachers as well.

Computer assisted assessment made history in Northport, New York. A pilot study analyzed the effect of computers, scanners, digital cameras, and video-editing software to complete performance assessments. The district and state standards are tied to graduation requirements; the students demonstrate mastery of standards through a

portfolio, which included a CD-rom, showing three years worth of accomplishments (Milone, 1995, p. 30). Students have a record of performance for future reference and a sense of pride for a product which included imagination, knowledge, and creativity, unlike looking back at a folder of multiple choice test scores.

<u>Cognitive and Metacognitive Structures</u>

Higher level learning requires a student to use cognitive abilities to comprehend the problem or task at hand, and then use metacognitive abilities to sort through possible solutions to execute the best possible solution. A change in student perceptions toward computer technology cannot and will not just happen if you put a student and a computer together (Milone, 1995, p. 33). The process is delicate and instruction is vital. In Hudson, New York, digital portfolios were required at the beginning of the year. Throughout the year, students and teachers evaluated what they were doing realizing they had combined a number of philosophical beliefs about the integration of technology (Milone, 1995, p. 34). Positive perceptions toward computer technology and the curriculum intertwine and support one another to create a student-centered educational environment which encourages students to use many of their intelligences and thinking processes.

Dr. Price, Associate Professor and Program Coordinator for Instructional Technology at Texas Tech University states, "Learning is an active process. Our primary job as technologists, instructional designers, and educators is to establish conditions that encourage or require learners to interact with and process instructional material at a level deep enough for them to learn it well and remember it (Price, 1996,

p.17). Students responsible for their own learning begins with positive perceptions toward the task at hand.

Terry Wolfe (1996), Educational Service Unit 3 Project Manager, traveled to 60 schools giving 3,400 students opportunities to learn lessons in new ways. The 'virtual worlds' (p. 14) allowed students to understand concepts enough to "create their own virtual worlds from scratch, working together, and collaborating in everything they do. This approach was engaging to the students. Students with behavioral problems sat through a 45 minute talk quietly and patiently" (Carberry, 1996, p. 14). The ownership students accept towards their own learning may depend largely on how the curriculum is packaged. Students learn differently and technology is a tool educators may use to facilitate individual student learning styles.

Summary

This chapter outlined learning theories related to the hypothesis and explored research about perceptions toward learning computer technology. These selected studies and opinions are representative of what is available in journals and documents. Unfortunately, the technology race often makes the studies and research obsolete as soon as they are documented. Computer technology frequently has the inherent misfortune of creating the product faster than educators can refine it for a tangible use. For example, research for the Apple IIe seems relatively meaningless when one considers interactive E-mail. The rapid development of technology is one dilemma educators acknowledge. The burden is on the educator to speculate as to the future use and validity of perceptions towards computer technology. The advantages of

computers appear to far outweigh any disadvantages. "We in the lower schools are being asked to radically reform so that the students are prepared to function successfully in the world of the 21st century. If this is the case, why are we still being required to teach an outmoded essentially 19th century, almost entirely academic curriculum (Clinchy, 1996, p. 269)? The expectations of communication in the future demand radical changes and a release from 'academic captivity' (Clinchy, 1996, p. 268). Proficiency in the areas of knowledge, assimilation, and interpretation of that knowledge and finally delivery of knowledge would be a more practical and realistic vision for the 21st century. The most effective institutions producing powerful communicators may be schools which have undergone profound technological change in order to give students a chance to compete in the world.

CHAPTER THREE

Methods and Procedures

Methods and procedures that were used in this study are presented in this chapter. The research design and null hypothesis are stated followed by the description of subjects and study procedures. Proposed instrumentation and data collection and analysis are also described in this research investigation.

Research Design

The pre and post test survey design utilized measures to record and document student perceptions for data analysis. Measurement and documentation was taken from four groups in the form of a pre and post test survey which described students' perceptions toward computers when editing, writing, and researching for applied oral communications. The survey measured change in students' perceptions toward computer technology over a period of eight weeks. Teacher observations through generated documentation cultivated underlying useful data.

Null Hypothesis

The null hypothesis states there is no measurable change in students' perceptions toward the integration of computer technology into the classroom when writing, editing, and researching for applied oral communications. There were no changes in student perceptions when computer technology was integrated into the writing, editing and researching process. A variety of technology including: the computer, Internet access, and computer assisted instruction made no difference in students' perceptions toward computers.

Subjects

Approximately 100 (four sections) computer assigned tenth grade language arts students were scheduled for a one semester class, (18 weeks). Students were assigned to one teacher.

Study Procedures

The four groups (four classes / approximately 25 each) were taught the applied oral communication curriculum using computer assisted methods of instruction. Measurement and documentation was taken from the four groups in the form of a pre and post test survey.

Instrumentation

The pre test survey was distributed at the beginning of an eight week period. The post test survey was distributed at the end of the eight week period. The pre and post test surveys measured students' perceptions toward writing and editing for applied oral communications when using computers. Teacher generated documentation generated underlying useful data about students' perceptions.

Data Collection

The student pre and post test survey and teacher observations were conducted within an eight week period. Students completed and participate in computer assisted instruction, activities, and assessment projects.

Data Analysis

An analysis of pre and post test survey scores were coded. The results included relationships between student perceptions toward computer technology when writing, editing, and researching for applied oral communication. The research and data analysis used supported

the hypothesis; tenth graders who are exposed to a variety of computer technology will change their perceptions toward writing and editing for applied oral communications.

CHAPTER FOUR

Presentation and Analysis of Data

Statement of the Problem

The question of this research is: does a tenth grader's perception toward the use of computers in writing for applied communications measurably change once computers are introduced into the curriculum?

Data Analysis

An analysis of pre and post test survey scores was coded. The results compared changes in students' perceptions toward computer technology when writing, editing, and researching for applied oral communications. The mean, standard deviation, and t-value were calculated for both pre and post tests and can be found in Table 1. The research and data analysis used test the hypothesis; tenth graders who are exposed to a variety of computer technology will change their perceptions toward writing and editing for applied oral communications.

Presentation and Analysis of Data

As evidenced in Table 1, student perceptions showed no statistical, significant changes one way or another. In less than one-third of the questions there was evidence to indicate no change occurred between the pre and post survey test, whatsoever. However, a closer look at specific student perceptions yielded useful conclusions about how technology is perceived by students from the beginning of the quarter to the end of the quarter. Students possessing prior computer experience and instruction may have affected change over the eight week period. An additional important issue queried whether student perceptions about technology was a useful tool in the classroom which facilitated learning.

Table 1 (questions 4-22)

TENTH GRADE APPLIED ORAL COMMUNICATIONS SURVEY

Question #	Mean (pre)	Mean (post)	St dev. (pre)	St. dev. (post)	t-value
4	3.59	3.8	1.04	0.89	0.6
5	3.3	3.66	1.17	1.16	0.95
6	4.2	4.39	0.91	0.86	0.59
7	3.31	3.41	1.12	1.13	0.26
8	3.77	3.89	1.05	1.03	0.34
9	4.08	4.27	0.87	0.75	0.63
10	4.54	4.53	0.64	0.76	-0.04
11	3.44	3.57	1.15	1.14	0.34
12	3.32	3.41	1.1	1.02	0.24
13	3.41	3.37	1.06	1.28	-0.11
14	3.48	3.43	0.91	1.09	-0.14
15	3.33	3.43	0.93	1.15	0.27
16	4	4.31	0.91	0.81	0.97
17	3.38	3.51	1.14	1.11	0.34
18	4.26	4.08	0.89	1.07	-0.5
19	3.6	3.73	1.1	0.98	0.35
20	4.05	4.01	1.02	1.03	-0.12
21	3.57	3.58	1.26	1.3	0.02
22	2.38	2.24	1.39	1.37	-0.33

This chapter is divided into 19 questions where a pre and post test compared students' perceptions toward technology at the beginning and ending of an eight week period of computer assisted instruction. Each question has the capacity and potential to explain how students feel and react to computers in the classroom.

Analysis of Data by Question

Table 2

Question 4

Using computer technology to prepare a written document is exciting.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
3.59	3.8	1.04	0.89	0.6

As evidenced by Table 2, students showed a slight increase and interest in using technology for writing activities. Although student perceptions reflect an average, neutral position on the pre test mean about the degree of excitement, many educators would be encouraged with post test mean of 3.8 and a t-value score of 0.6. The treatment may not have stimulated significant student excitement when using computers, but the treatment apparently did have some influence.

Table 3

Question 5

Computers can help motivate students to work longer on writing assignments.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
3.3	3.66	1.17	1.16	0.95

Table 3 demonstrates student perceptions to be initially average and indifferent one way or another about whether computers can motivate students to work longer; however, the post test mean score indicates there is an increase from 3.3 to 3.66. The t-value of 0.95 still does not validate a significant change.

Table 4

Question 6

Word processing a document improves the overall quality of the writing assignment.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
4.2	4.39	0.91	0.86	0.59

The average or mean in Table 4 reflects student perceptions agree that word processing can improve the quality of a writing assignment. After the treatment the post test mean increased only slightly. Computers are perceived as useful before computer assisted instruction

and their usefulness continues after additional exposure and instruction.

Table 5

Question 7

The Internet takes too much time when researching for a writing project.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
3.31	3.41	1.12	1.13	0.26

Table 6

Question 8

Computer based writing assignments fail to stimulate my thinking and creativity.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
3.77	3.89	1.05	1.03	0.34

Tables 5 and 6 probe student perceptions towards the Internet and using the computer for writing assignments. Both responses reflected pre test responses indicating indecision either way. However, post test responses marked slight increases for both. Noting that Internet access was limited to students who had home access, and approximately 2 computers with Internet access to every 25 students was not equitable access for all students. Both t-value scores reflected slight but non-significant changes in perceptions from the pre test to the post test.

Table 7

Question 9

Computer technology offers an opportunity for research and cognition when composing writing assignments.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
4.08	4.27	0.87	0.75	0.63

Table 7 indicates that students perceptions about researching on a computer is an opportunity to discover information when writing. The survey indicates a modest change with a t-value of 0.63. Albeit the change is modest but not significant, students do reveal technology provides useful assistance.

Table 8

Question 11

Outlining is easier when using a computer to organize ideas for writing assignments.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
3.44	3.57	1.15	1.14	0.34

Table 9

Question 12

Using a computer can slow down my outlining process for speech writing.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
3.32	3.41	1.1	1.02	0.24

The results from Tables 8 and 9 ask students' perceptions towards outlining on the computer. Both pre test mean scores show students cannot decide either way. After the treatment, post test scores both reveal very slight degrees of change. The t-value scores of 0.34 and 0.24 are positive but not significant changes, which may indicate the opportunity to use computers to outline is a new skill needing more time to develop and practice.

Table 10

Question 10

Editing on a computer will improve the final draft.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
4.54	4.53	0.64	0.76	-0.04

Table 11

Question 13

The computer thesaurus program does not help build my vocabulary.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
3.41	3.37	1.06	1.28	-0.11

Tables 10 and 11 are questions about editing a final draft. Grammar check and the thesaurus software ask students to make cognitive choices. Even though the technology does the major share of the work, the student is still required to apply prior knowledge to select the correct word or know punctuation and grammar rules. Both t-values

reflect negative values of -0.04 and -0.11 which indicates there was no positive change in perceptions and the computer assisted instruction may have created negative perceptions.

The editing software pre test mean score showed the average student perception was 4.54, students agree editing software is beneficial. The post test mean was 4.53. The difference is slight. Similarly, the thesaurus program averaged a pre test mean score of 3.41 and post test mean score of 3.37. Curiously, both are editing tools which require additional knowledge other than perfunctory mechanical reflexes.

Table 12

Question 16

The use of the thesaurus on the computer can improve the final draft.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
4	4.31	0.91	0.81	0.97

Table 12 identifies the thesaurus on the computer as a tool students agree from the beginning is helpful to improve a final draft. And following the computer assisted instruction, students indicated, though slight, an increase of the mean, 4.31 from 4. This change had a t-value of 0.97, one of the greatest indicators of significant change.

Table 11 indicates student perceptions toward the thesaurus programs as not helpful in building vocabulary. Students might acknowledge the thesaurus as a quick solution as evidenced in Table 12, but not possessing any long term benefits toward effective vocabulary

building in Table 11. Students using the thesaurus may have to be taught how this tool can build vocabulary as an extension of its intrinsic value as a word finder.

Table 13

Question 14

Peer editing writing assignments on the computer is faster and more effective.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
3.48	3.43	0.91	1.09	-0.14

Table 13 results about student perceptions of peer editing writing assignments on the computer did reveal the mean or average for both pre and post tests as students not having an opinion one way or another. However, the post test mean, 3.43 is less than the pre test mean result, 3.48, which offered a non-significant t-value of -0.14. Possibly students did not effectively use peer editing for many reasons. Ineffective partners, poor cooperative learning skills, and the quality of prior instruction may be variables affecting the results.

Table 14

Question 15

Computer research programs are limited in depth and scope.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
3.33	3.43	0.93	1.15	0.27

Table 15

Question 19

Reading research from the computer resources is not easy.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
3.6	3.73	1.1	0.98	0.35

Table 16

Question 22

Printing research from the computer is better than taking handwritten notes.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
2.38	2.24	1.39	1.37	-0.33

In Tables 14, 15 and 16 research on the computer is analyzed for its breadth, scope, user friendliness, and usefulness. The mean scores on the pre test for breadth, scope, and user friendliness show student perceptions to be neutral and modest increases on the post test. The t-value scores were 0.27 and 0.35, measuring a slight but non-significant degree that researching on the computer may be limited and not easy to access. With a t-value of -0.33, students agreed from the pre test that computer note taking is easier than writing by hand, but by the post test students were less sure that note taking on the computer was easier. However slight, the results may indicate traditional handwritten note taking may be preferred by tenth grade students.

Table 17

Question 17

The computer could make a speech presentation more exciting.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
3.38	3.51	1.14	1.11	0.34

In Table 17 student perceptions on the pre and post tests identified a neutral position when using computers to make speech presentations. Both mean pre and post results, 3.38 and 3.51 respectively, identify a very slight increase. The t-value, 0.34, reflected that students' experience may have had some positive effect, although not a significant change.

Table 18

Question 18

Computer technology enables the writer to read and make quick changes effectively.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
4.26	4.08	0.89	1.07	-0.5

Table 19

Question 20

Using computers to word process causes me anxiety, stress, and fear.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
4.05	4.01	1.02	1.03	-0.12

From Tables 18 and 19 student responses reflected pre test mean scores, 4.26 and 4.05, as perceptions favorable and agreeable that computers do not create learning anxiety and are a helpful tool enabling quick edits effectively. The post test mean scores; however, also share a surprising result. After computer assisted instruction, student perceptions identified a slight decrease in editing on the computer for quick, effective changes. A t-value of -0.5 is a slight drop, but an indication that the current tools are not as effective as what students were using prior to instruction. Also, student anxiety, stress, and fear increased over the eight week period between the pre and post test. A t-value of -0.12 may indicate frustration with the aging technology which is time consuming waiting for: access to a computer, printing, and slow running CD-roms. Aging technology could account for stressful experiences.

Table 20

Question 21

Spell check on the computer does not help me be a better speller.

Mean (pre)	Mean (post)	St. dev. (pre)	St. dev. (post)	t-value
3.57	3.58	1.26	1.3	0.02

Student perceptions reflected in Table 20 respond to the spell check software located on the computer. Although pre test averages show a mean of 3.57, the post test mean was only 3.58. The t-value of 0.02 is a minor increase indicating a slight but not significant change. Students may simply use spell check as a tool to fix and repair a

document. There is no evidence to indicate students are using spell check to help them become better spellers.

CHAPTER FIVE

Summary, Conclusions and Recommendations

Summary

The purpose of this chapter discusses the results of the pre and post test survey of students' perceptions toward technology while studying applied oral communications. This discussion includes: restatement of the hypothesis, procedures used to conduct the study, and computer assisted instruction, treatment of the data collected, and finally, future recommendations for further study in this area.

Restatement of the Hypothesis

Tenth grade students who are exposed to technology which included: Internet, CD-rom, word processing, and editing software will significantly change their perceptions toward writing and editing for applied oral communications as measured by the Tenth Grade Applied Oral Communications Survey. The change in perception is an opportunity which may enable these students to formulate and construct their own understanding from observable facts to clear concise conclusions which may improve their communication.

Procedures

Approximately 100 (four sections) computer assigned tenth grade language arts students were scheduled for a one semester class, (18 weeks). Students were assigned to one teacher. The four groups (four classes / approximately 25 each) were taught the applied oral communication curriculum using computer assisted methods of instruction. Measurement and documentation was taken from the four groups in the form of a pre and post test survey. The pre test survey was

distributed at the beginning of an eight week period. Instructional activities required students to conduct research on the Internet, utilize CD-rom software, and word process using editing software to complete activities and assessment projects. The post test survey was distributed at the end of the eight week period of computer assisted instruction. The pre and post test surveys measured student perceptions toward writing and editing for applied oral communications when using computers.

Treatment of Data

The survey utilized the R.S. Likert Scale design. All subjects were given the pre test prior to computer integrated curriculum. The statistical procedures to code the pre and post test were set up in a table format which compared the two tests by calculating: the mean scores, the standard deviation scores and the t-value scores of 97 pre tests and 85 post tests. Each question asked students to offer opinions about their perceptions based on their personal experience. Each question was then analyzed and interpreted to discover a change in perceptions based on a mean score, standard deviation score, and the t-value score. Drawn conclusions were the result of the pre and post survey test data.

Principle Findings

Post hoc comparisons can be executed to discover whether change did occur between the pre and post survey tests administered to tenth graders at Thomas Jefferson High School during the spring session of the third quarter 1997 academic school year. The results of this study are generalizations of situations only after definite relationships between a pre and post test survey were coded and can be found in Table 1. An

examination of the findings in this study has led to the following conclusions in regard to students' perceptions toward technology when applied to applied oral communications:

1. Computer assisted treatment may not have stimulated significant student excitement or the motivation for students to work longer when using computers, but the treatment was apparently not rejected either. The challenge to motivate is extended when teaching older learners in the use of technology.

2. Student perceptions agree that word processing can improve the quality of a writing assignment. Computers are perceived by tenth graders as useful before computer assisted instruction and their usefulness continues after additional exposure and instruction.

3. Student perceptions towards the Internet and using the computer for writing assignments indicate indecision either way. However, post test responses marked slight increases for both. Noting that Internet access was limited to students who had home access, and approximately two computers with Internet access to every 25 students, computer access time was not equitable for all students.

4. Students' prior computer experience suggests their perceptions about researching on a computer is an opportunity to discover information when writing. Although the change is small, students do perceive that technology provides useful assistance.

5. The skill of outlining showed very slight degrees of change in student perceptions. The positive change may indicate that the opportunity to use computers to outline is a new skill needing more time to develop and practice.

6. Grammar check and the thesaurus software ask students to apply prior knowledge to select the correct word or know punctuation and grammar rules. Both t-values reflect negative values which indicates there was no positive change in perceptions and the computer assisted instruction may have created negative perceptions. However, students agree editing software which included the thesaurus is beneficial and one of the greatest indicators of change on the survey. Curiously, both are editing tools which require more knowledge than perfunctory mechanical reflexes.

7. Student perceptions toward the thesaurus program indicates that it is not helpful in building vocabulary. Students might acknowledge the thesaurus as a quick solution as evidenced in Table 12, but not possessing any long term benefits toward effective vocabulary building in Table 11. Students using the thesaurus may have to be taught how this tool can build vocabulary as an extension of its intrinsic value as a word finder.

8. Students do not have an opinion one way or another about peer editing for a written document. Possibly students did not effectively use peer editing for many reasons. Ineffective partners, cooperative learning skills are lacking, and inadequate prior instruction may be variables affecting the results.

9. Research on the computer showed student perceptions to be neutral and indicated modest increases measuring a small degree that researching on the computer may be limited and not easy to access. Students agreed that computer note taking is easier than writing by hand, but by the post test students were less sure that note taking on

the computer was easier. However slight, the results may indicate that traditional handwritten note taking may be preferred by tenth grade students. The time permitted to take notes using the computer required students to work rapidly within the class period, or stay after school to use the technology.

10. Student perceptions showed a neutral position when using computers to make speech presentations. Both mean pre and post results identify a very slight increase. Students' experiences during the computer assisted instruction may have had some positive effect, although not a significant change.

11. Computers do not create learning anxiety and are a helpful tool enabling quick edits effectively. After computer assisted instruction, student perceptions identified a slight decrease in editing on the computer for quick, effective changes. A slight drop is an indication that the current tools are not as effective as what students were using prior to instruction. Also, student anxiety stress and fear increased over the eight week period between the pre and post test. This result may be an indication of an increase in frustration with the aging technology which could account for stressful experiences.

12. Student perceptions about the spell check software located on the computer showed a minor increase from the pre test to the post test. Students may simply use spell check as a tool to fix and repair a document. There is no evidence to indicate students are using spell check to help them become better spellers.

13. The highest mean scores from Table 1 ranged from 4 to 4.54 on the pre test. Questions 6, 9, 10, 16, 18, and 20 reflect favorable

perceptions towards computers improving the quality, offering opportunity to research, editing, and working without computer anxiety. Students began the study with prior experience on computers. Making an additional impact with computerized instruction over an eight week period indicates slight increases in change which continue to reflect favorable perceptions of technology.

Auxiliary Observations

A tenth grader's ability and likelihood of discovering how to use technology tools and then implement the tools for practical use is a complex web which requires intensive study. The variables controlling student perceptions are neither easily predicted or measured. Variables which include past experience, previous instruction, types of technology attempted, and the computer assisted instruction time between the pre and post testing are difficult to determine. Technology has the inherent disadvantage of possibly becoming outdated and obsolete as quickly as teachers are able to develop and adapt the curriculum. Because the cost of technology is initially greater than the cost of a classroom set of textbooks (which have a lifespan of ten years) the computer equal access to all students, by comparison, may be limited. Waiting for a turn at the computer, or for a slow running, overtaxed server may affect student attitudes and perceptions toward technology.

Recommendations

Recommendations for further study related to this inquiry would include using the same control group, but including additional questions on the survey to include multiple content area subjects across the curriculum in the areas of math, social studies, and science.

The research design could also be modified to include more qualitative data such as student journaling to summarize personal perceptions of the effectiveness of the computer assisted instruction and individual student learning.

Another related area of inquiry to be considered for investigation is the impact of prior learning experiences compared to those students who have had little or no experience. Differing student aptitudes and learning styles would highlight future research and could shed new light on the effectiveness of a student's learning experience.

An extension on time on the length of the study could also prove beneficial to providing more realistic data. A longer instruction period may give both the teacher and students the opportunity and the stimulus to pursue new ideology with additional patience, curiosity, and respect.

A break down of gender, culture, and socioeconomic background may prove to be a valid educational concern. The additional data would provide further information which could help educators more effectively reach difficult students whose perceptions are not enlightened because opportunity and access to computers has been limited.

Appendix A

**University
of Nebraska**

Nebraska's Health Science Center

Institutional Review Board
  For the Protection of
  Human Subjects

February 24, 1997

Ms. Angela Ankenbauer
3409 North 49th Street
Omaha, NE 68104

IRB#: 083-97-EX

TITLE OF APPLICATION/PROTOCOL: A Survey Measuring Perceptions of Tenth Grade English
Students at Thomas Jefferson High School Toward the Use of Computers in Writing for Applied
Communication

Dear Ms. Ankenbauer:

The IRB has reviewed your Exemption Form for the above-titled research project. According to the
information provided, this project is exempt under 45 CFR 46.101b, category 1. You are therefore
authorized to begin the research.

It is understood this project will be conducted in full accordance with all applicable sections of the
IRB Guidelines. It is also understood that the IRB will be immediately notified of any proposed
changes that may affect the exempt status of your research project.

Please be advised that the IRB has a maximum protocol approval period of five years from the
original date of approval and release. If this study continues beyond the five year approval period,
the project must be resubmitted in order to maintain an active approval status.

Sincerely,

Ernest D. Prentice, PhD
Vice Chair, IRB

EDP:jlg

Institutional Review Board
EXEMPTION FORM

Section 3: Review Information

I. Purpose of the Study

The purpose of this study is to measure attitudes of 10th grade English students at Thomas Jefferson High School toward the use of computers in speech writing for oral communication.

II. Characteristics of the Subject Population

    a. Age Range: The participants will all be 10th graders, ages between 15 and 16 years.
    b. Sex: Both male and female students will be asked to participate in this study.
    c. Number: Approximately 90 to 100 participants are anticipated for this study.
    d. Selection Criteria: Students registered to take 10th grade English at Thomas Jefferson High School were asked to voluntarily submit to the testing.

III. Method of Subject Selection

A letter will be mailed to all parents of students asked to participate. The letter will outline the purpose of the study and ask participants to submit to testing at a predetermined date.

IV. Study Site

The pre testing will be conducted on February 21, 1997, at Thomas Jefferson High School. The post testing will be conducted on April 18, 1997.

V. Description of Procedures

Each participant will take a 23 question pre test. Eight weeks of instruction utilizing computer technology will precede the 23 question post test. The scores obtained earlier in the pre test will be compared to those obtained in the post test.

VI. Confidentiality

Individual names and schools will not be used to report the results. Only group scores will be analyzed and reported. All testing material will be kept strictly confidential by the investigator.

VII. Informed Consent

This study is exempt from informed consent as participants' names and schools will not be used in discussion.

VIII. Justification of Exemption

1. Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as: the measurement of attitudes on 10th grade students who write and speak using computer technology.

2. Research involves the use of educational tests and subjects which cannot be identified.

3. The study procedures do not represent a significant deviation in time or effort requirements from those educational practices already existent at the study site.

4. The study procedures involve no increase in the level of risk or discomfort attendant normal, routine educational practices.

5. The study procedures do not involve sensitive subjects, only approved curriculum by the school board.

6. Provisions are made to ensure the existence of a non-coercive environment for those students who choose not to participate.

7. The school has given written approval for the research to be conducted.

Thomas Jefferson High School

2501 WEST BROADWAY   COUNCIL BLUFFS, IOWA 51501
PHONE (712) 328-6493

February 18, 1997

Dr. Ernest Prentice
Institutional Review Board
Eppley Science Hall 3018
University of Nebraska Medical Center
Omaha, Nebraska 68198-6810

Dear Dr. Prentice,

I understand Angela Ankenbauer's request to conduct a study in connection with her master's thesis program at the University of Nebraska at Omaha with her 10th grade English students.

I also understand the study concerns measuring perceptions of 10th grade English students at Thomas Jefferson High School toward the use of computers in speech writing for oral communications. A 23 question pre and post test will be administered in conjunction with the regular curriculum. The study will involve writing, researching and speaking presentations using computer technology. All instruction will focus on meeting regular curriculum goals and objectives. The instructional techniques used, and compared in the study are well accepted and respected in the educational community.

All tests and data collected will be anonymous and confidential, and an analysis of the data collected will be available upon completion of all research are agreeable terms.

I support Angela Ankenbauer's study and give my full permission to the terms as outlined in the above paragraphs.

Sincerely,

Mr. Warren Weber
Principal, Thomas Jefferson High School

Thomas Jefferson High School

2501 WEST BROADWAY   COUNCIL BLUFFS, IOWA 51501
PHONE (712) 328-6493

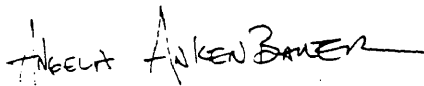February 20, 1997

Dear Parent or Guardian:

Your daughter or son is a member of an English 4 class that has been selected to potentially participate in a research study. This study is being done in conjunction with a master's degree program at the University of Nebraska at Omaha. I am the principal investigator in the study and will work with Dr. Neal Grandgenett, assistant professor in the Department of Teacher Education at UNO. The study has the approval of our principal,
Mr. Warren Weber.

The study concerns measuring attitudes of 10th grade English students at Thomas Jefferson High School toward the use of computers in speech writing for oral communications. A 25 question pre and post test will be administered in conjunction with the regular curriculum. The study will involve writing, researching and speaking presentations using computer technology. All instruction will focus on meeting regular curriculum goals and objectives. The instructional techniques used, and compared in the study are well accepted and respected in the educational community.

All tests and data collected will be anonymous and confidential. An analysis of the data collected will be available upon completion of all research.

If you have any questions or if you object to the participation of your son or daughter, please contact me at 328-6493.

Sincerely,

Angela M. Ankenbauer
Teacher, Thomas Jefferson High School

IRB Approval # 083-97-EX

Thomas Jefferson High School

2501 WEST BROADWAY   COUNCIL BLUFFS, IOWA 51501
PHONE (712) 328-6493

February 18, 1997

Dr. Ernest Prentice
Institutional Review Board
Eppley Science Hall 3018
University of Nebraska Medical Center
Omaha, Nebraska 68198-6810

Dear Dr. Prentice,

I am a graduate student in the Department of Teacher Education at the University of Nebraska at Omaha, and will be conducting a research study involving human subjects as part of my graduate program and participation in the graduate program at UNO. Included with this letter is my request for IRB review, my related research prospectus, and the parent or guardian informed consent letter. I have also included your standard exemption form since I believe that the study qualifies for your "exempt" status in accordance with the 45 CFR 46:101 (b) categories and guidelines.

I can be contacted at 328-6493 during the hours of 7:00 - 4:00, or at my home number of 451-6587 during other times. I am also working with
Dr. Don Grandgenett, (554-3512) and Dr. Neal Grandgenett (554-2690) from the University of Nebraska at Omaha, who also would be happy to answer any questions.

Thank-you for your consideration of my request, and I look forward to hearing from you.

Sincerely,

Angela Ankenbauer
3409 North 49th Street
Omaha, Nebraska 68104

TENTH GRADE APPLIED ORAL COMMUNICATIONS SURVEY

Survey by Angela Ankenbauer

A Survey Measuring Perceptions of Tenth Grade English Students at Thomas Jefferson High School Toward the Use of Computers in Speech Writing for Applied Oral Communications

ANONYMOUS AND VOLUNTARY PARTICIPATION: All data collected by this survey will be kept in the strictest confidence. No individual data will be reported in any report, and only group information will be analyzed and described. Individuals have the full right to participate or not participate in the survey as desired, without any repercussions of any kind for this decision. This survey is coordinated by Dr. Don Grandgenett, Dr. Neal Grandgenett, Dr. Elaine Ward and Dr. Elliott Hostler, University of Nebraska at Omaha.

DIRECTIONS: Please answer the following questions as accurately as possible. Pay close attention to the questions. If you are unsure of your answer, please just code the best response possible.

In this section, please **circle only one response** to each question.

1. Gender?
   a. male
   b. female

2. I have used a computer for the following activities: (Please mark **ALL answers** that apply).
   a. word processing
   b. spreadsheet
   c. data base
   d. media presentations
   e. other_____(please specify)

3. The following best describes my exposure to computers: (Please mark **ALL answers** that apply).
   a. I have not had any experience with computers.
   b. My family has a computer at home that I use.
   c. My family has a computer at home that I do not use.
   d. I have have had experience with computers at school.
   e. I have had experience with computers somewhere other than school.

Please respond to the following questions **using the key provided below**.
Circle the best answer which most closely agrees with how you feel.

"I strongly agree"
"I agree"
"I cannot decide"
"I disagree"
"I strongly disagree"

4. Using computer technology to prepare a written document is exciting.
   5 = "I strongly agree"
   4 = "I agree"
   3 = "I cannot decide"
   2 = "I disagree"
   1 = "I strongly disagree"

5. Computers can help motivate students to work longer on writing assignments.
   5 = "I strongly agree"
   4 = "I agree"
   3 = "I cannot decide"
   2 = "I disagree"
   1 = "I strongly disagree"

6. Word processing a document improves the overall quality of the writing assignment.
   5 = "I strongly agree"
   4 = "I agree"
   3 = "I cannot decide"
   2 = "I disagree"
   1 = "I strongly disagree"

7. The Internet takes too much time when researching for a writing project.
   1 = "I strongly agree"
   2 = "I agree"
   3 = "I cannot decide"
   4 = "I disagree"
   5 = "I strongly disagree"

8. Computer based writing assignments fail to stimulate my thinking and creativity.
   1 = "I strongly agree"
   2 = "I agree"
   3 = "I cannot decide"
   4 = "I disagree"
   5 = "I strongly disagree"

9. Computer technology offers an opportunity for research and discovery when composing writing assignments.
   - 5 = "I strongly agree"
   - 4 = "I agree"
   - 3 = "I cannot decide"
   - 2 = "I disagree"
   - 1 = "I strongly disagree"

10. Editing on a computer will improve the final draft.
    - 5 = "I strongly agree"
    - 4 = "I agree"
    - 3 = "I cannot decide"
    - 2 = "I disagree"
    - 1 = "I strongly disagree"

11. Outlining is easier when using a computer to organize ideas for writing assignments.
    - 5 = "I strongly agree"
    - 4 = "I agree"
    - 3 = "I cannot decide"
    - 2 = "I disagree"
    - 1 = "I strongly disagree"

12. Using a computer can slow down my outlining process for speech writing.
    - 1 = "I strongly agree"
    - 2 = "I agree"
    - 3 = "I cannot decide"
    - 4 = "I disagree"
    - 5 = "I strongly disagree"

13. The computer thesaurus program does not help build my vocabulary.
    - 1 = "I strongly agree"
    - 2 = "I agree"
    - 3 = "I cannot decide"
    - 4 = "I disagree"
    - 5 = "I strongly disagree"

14. Peer-editing writing assignments on the computer is faster and more effective.
    - 5 = "I strongly agree"
    - 4 = "I agree"
    - 3 = "I cannot decide"
    - 2 = "I disagree"
    - 1 = "I strongly disagree"

15. Computer research programs are limited in depth and scope.
    - 1 = "I strongly agree"
    - 2 = "I agree"
    - 3 = "I cannot decide"
    - 4 = "I disagree"
    - 5 = "I strongly disagree"

16. The use of the thesaurus on the computer can improve the final draft.
     5 = "I strongly agree"
     4 = "I agree"
     3 = "I cannot decide"
     2 = "I disagree"
     1 = "I strongly disagree"

17. The computer could make a speech presentation more exciting.
     5 = "I strongly agree"
     4 = "I agree"
     3 = "I cannot decide"
     2 = "I disagree"
     1 = "I strongly disagree"

18. Computer technology enables the writer to read and make quick changes effectively.
     5 = "I strongly agree"
     4 = "I agree"
     3 = "I cannot decide"
     2 = "I disagree"
     1 = "I strongly disagree"

19. Reading research from the computer resources is not easy.
     1 = "I strongly agree"
     2 = "I agree"
     3 = "I cannot decide"
     4 = "I disagree"
     5 = "I strongly disagree"

20. Using computers to word process causes me anxiety, stress and fear.
     1 = "I strongly agree"
     2 = "I agree"
     3 = "I cannot decide"
     4 = "I disagree"
     5 = "I strongly disagree"

21. Spell check on the computer does not help me be a better speller.
     1 = "I strongly agree"
     2 = "I agree"
     3 = "I cannot decide"
     4 = "I disagree"
     5 = "I strongly disagree"

22. Printing research from the computer is better than taking handwritten notes.
     1 = "I strongly agree"
     2 = "I agree"
     3 = "I cannot decide"
     4 = "I disagree"
     5 = "I strongly disagree"

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