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ABSTRACT

The Writing-Aid and Author's Helper (WANDAH) computer writing system, funded by the Utah State Office of Education Productivity Program, was used successfully in the Logan High School in the 1984-85 school year. Seven additional project were funded to replicate the Logan project throughout Utah during 1985-86. The main objective of the projects was to improve students' writing skills by increasing the amount of writing which students did and the amount of individualized writing aid they received. In each project lab, there were only 12 to 20 computers, not enough to accommodate a total class of students, primarily 11th and 12th graders. This report presents the results of a statewide level evaluation of the WANDAH Project. At each project, students, teachers, and principals were interviewed. Quantative data on students' writing performance and attitudes were collected through pre- and posttests. Results showed that WANDAH projects made significant contributions to educational productivity (greater goal achievement without decreasing student teacher ratios). The quantity of writing instruction and the amount of student writing increased. The quality of students' writing and their attitudes towards writing on the computer improved as well. Appendices include: (1) 1985-86 WANDAH productivity projects and the schedule of site visits; (2) preliminary reports, project guidelines and statewide executive summary; (3) site visit and testing letters; (4) site visit interview guidelines; (5) posttest writing prompts and instructions; (6) revision tally sheet and scoring instructions and attitude surveys; (7) holistic scoring procedures and guidelines; (8) descriptions of the dependent measures; (9) pretest and posttest means and standard deviations; (10) analyses of adjusted and unadjusted posttest means; and (11) analyses sent to third-party evaluators. Three tables are included. (JAZ)

UTAH STATE OFFICE OF EDUCATION
1985-86 PRODUCTIVITY PROGRAM
STATEWIDE EVALUATION REPORT

ON

THE USE OF TECHNOLOGY TO IMPROVE WRITING SKILLS PROJECTS

PREPARED BY
JAMES P. SHAVER

Utah State Office of Education

PRODUCTIVITY PROGRAM: THE USE OF TECHNOLOGY TO IMPROVE WRITING SKILLS PROJECTS 1985-86 School Year

STATEWIDE EVALUATION REPORT
August 1, 1986

James P. Shaver
Statewide Evaluator

EXECUTIVE SUMMARY

Statewide Evaluation Report
USOE USE : OF TECHNOLOGY TO IMPROVE
WRITTING SKILLS PROJECTS
1985-86

Productivity in Education Means Doing More with the Same or Less

Increased productivity in the use of educational tax funds is a valid societal concern. Increased educational productivity is likely to be of particular interest to taxpayers and government officials in a state, such as Utah, where the public school population is increasing and many people believe that the tax base to support schools is severely strained. Increased productivity can be thought of as teaching a greater number of students with the same tax money, or as greater achievement of desirable educational outcomes without increases in expenditures per student.

Writing Skills are Basic

The development of students' writing skills is an educational objective which appears to have nearly universal support in our society. The ability to write is not only essential in one's personal life, and important as a means of self-expression, but it is a central prerequisite to economic success. At the same time, it is widely - agreed that students need to write in order to learn to write, and that their opportunities to do so are typically not sufficient. Along with practice in writing, individualized comments and suggestions for improvement are indispensable if significant gains in writing skills are to be achieved.

WANDAH Was Intended to Increase Productivity in English Classes

The "Use of Technology to Improve Writing Skills" projects of the Utah State Office of Education (USOE) Productivity Program are aimed at increased

productivity in the area of [illegible] primarily in the second sense in which the word is defined [illegible] purpose is to improve students' writing skills by increasing the amount of writing which students do and the amount of individualized writing [illegible] they receive. To that end, each project has used the WANDAH (Writing Aid and Author's Helper) computer writing system in a computer writing lab in conjunction with the language arts curriculum.

The first WANDAH productivity project was funded by USOE at the Logan High School during the 1984-85 School Year. A positive first-year evaluation of the Logan project led USOE to fund seven additional projects during the 1985-86 School Year. (Eight projects were funded, but reference throughout this report will be to seven projects. One of the new projects, using telecommunications to bring writing instruction to remote schools in the northeastern part of Utah, encountered technological problems which delayed implementation so long that evaluation was not feasible this year.) The seven project schools, located in urban and rural areas from Spanish Fork to Logan, are Logan High School, Mountain Crest High School, North Summit Middle and High Schools, Park City High School, Pleasant Grove High School, Roy High School, and Spanish Fork High School.

In each WANDAH project writing lab, there are from 12 to 20 computers, not enough computers to accommodate a total class of students, except occasionally in one school district which has relatively small student-teacher ratios. All but one of the writing labs have a paid writing lab aide. Five of the six paid aides are professionally trained teachers who have been out of teaching and have now come back to the field; one aide is an experienced paraprofessional.

The students involved in the WANDAH projects are primarily eleventh and twelfth graders. However, some ninth and tenth graders are given

introductory experience on computers; and, in one school district the students in a middle school (seventh and eighth graders) have had writing on the computer included as part of their language arts instruction this year.

Most of the new projects were not able to begin use of the WANDAH system when school started in the fall because equipment and software had not arrived. Start-up times ranged from October to December. Evaluation of the projects, therefore, is based on a period of use from late fall until late spring (April), when site visits and posttesting took place.

Two types of data were gathered for the evaluation: (1) At each project school, users of the WANDAH project--English teachers, students, the school principal, and nonEnglish teachers--were interviewed during an all-day site visit. (2) Quantitative data were obtained through pre and post administrations of writing prompts (one of which was scored for number of student revisions and both of which were scored for quality of writing using common accepted holistic coding), pre- and posttesting with a survey of attitudes toward writing, and a posttest survey of attitudes toward writing with computers.

WANDAH Helped Improve the Teaching and Learning of Writing Skills

From the site-visit interviews, it was dramatically evident that the WANDAH projects had resulted in increased productivity in the second sense of the word--that is, there had been increases in the amount of teaching of writing and in the quantity of student writing, without a decrease in teacher-student ratios and with some attendant increases in quality of writing. Students, teachers, and principals were generally in agreement that students were doing more writing assignments and writing longer, and better, compositions in the writing labs than before. Principals, in particular,

commented on the increased instruction as a positive productivity outcome of the WANDAH projects.

Teachers and students agreed that students were producing higher quality writing on the computer and enjoying writing more. In fact, many students who had disliked writing before were now enjoying it, and teachers commented that students who had not known that they could write were turning out surprisingly creative and well-done pieces of writing on the computer. Many students reported that WANDAH was both fun and easy to use, and that writing on the computer helped to relieve their writing anxiety.

Based on comments during the interviews, there is some uncertainty about the extent to which, at this brief point in the projects' histories, quality of writing and attitudes toward writing had transferred from the computer to other English assignments or to assignments in other courses. Some teachers thought better writing quality and attitudes toward writing were discernible, even on nonEnglish-class writing assignments; others were not so sure. Students' judgments also varied as to whether the improved quality which they perceived in their own writing when using the computer and their reportedly positive attitudes toward writing with computers had yet transferred to noncomputer writing situations. Some students were convinced that their writing and/or attitudes were, in general, better; some were uncertain; a few were sure that no transfer had occurred.

The quantitative data did not contradict what was communicated during the interviews. Project students' gains in quality of writing and attitude scores from pretesting to posttesting varied, with some groups even showing declines. Comparisons of groups of eleventh and twelfth-grade project students with eleventh and twelfth-grade students in a comparison school revealed a similar pattern of inconsistency. However, overall, project

students had more gains as compared to the comparison groups, particularly at the twelfth-grade level.

WANDAH Affected the Full Range of Students

The near unanimous positive reaction to the WANDAH projects by students, teachers (including nonEnglish teachers, who would like to see use of the writing labs extended more frequently to their curricular areas and the writing labs more readily available for nonEnglish-class use by students), and principals was surprising. Educational innovations rarely have such wide appeal. There were varying reasons for the reports of effectiveness, and attractiveness, of the WANDAH system with a wide spectrum of students. The more academically-oriented and skilled writers appreciated in particular the word processing part of the WANDAH system which allowed them to make revisions easily; the less academically-oriented skilled writers especially appreciated the neatness of their printed papers, along with the editing aids which helped them to detect usage and spelling errors.

The response was similar across grade levels, as well as across students with differing degrees of academic motivation and writing skills. The director of the project which included seventh and eighth-grade students noted that those students worked well and learned well from the computer, although not at the sophistication that older students might. The quality of writing and attitude scores of the seventh and eighth graders were consistent with that observation; they were remarkably similar to those of the older students.

Despite Some Qualifications, Teachers Were Generally Positive About WANDAH

Despite the unexpectedly overall positive reactions to and results with the WANDAH projects, it would not reflect reality to say that everything was

ideal. A few students did not like writing on the computer, particularly if they lacked keyboarding skills or if they had computers at home with word processing programs which they preferred to the word processing part of the WANDAH system. A minority of teachers noted that their workloads had increased because they gave more writing assignments and students wrote longer compositions. All of the teachers agreed, however, that individual assignments were now easier to read because of the neatness of the printed copy and because students now edited and revised more thoroughly. In addition, the more carefully edited papers allowed teachers to focus their attention on more fundamental aspects of the students' writing, such as theme development.

In every school, too, teachers mentioned scheduling and instructional problems because of the limited number of computers. Only one class could be assigned to the writing laboratory at a time; even then, typically only half or less of the class could be writing on the computers at once, with the other students remaining in the classroom if extra space was not available in the writing lab. A full-time writing lab aide was deemed essential to cope with this situation; the teachers in the one school with no aide were finding use of the writing lab to be extremely difficult, if not near impossible.

Also, a few teachers were not comfortable with abandoning formal instruction in grammar in favor of teaching grammar and usage as individual problems arise in writing, as is emphasized by the State Core Curriculum and by the WANDAH projects. And, while most teachers did not think that the WANDAH project was lessening the amount of literature taught, some did. At the same time, many teachers were convinced that their students were learning more grammar through writing, and some said they were able to teach more

literature by integrating literature and writing instruction. All teachers agreed that writing instruction is central to the language arts curriculum, and none expressed a desire to see the writing lab gone.

WANDAH Enhanced the Writing Process

With the emphasis on process writing instruction nationally and in the State Core Curriculum, it is significant that all of the teachers saw the WANDAH projects as supportive of that approach. For some, the WANDAH project helped them to become process writing teachers--more adept at taking their students through a process of planning, writing, review of one another's papers, and revision. For those already teaching from a process writing perspective, having students write with computers using the WANDAH system aids complemented their approach well.

The evaluation results indicate that the WANDAH projects did increase educational productivity, in the sense of the greater achievement of desirable educational goals without decreasing student-teacher ratios. There was clear evidence from the interviews that the quality, as well as quantity, of student writing has improved on the computers, along with improvements in attitudes toward writing. That more striking consistent increases were not found on the assessments of quality of students' writing and attitudes toward writing at the end of only six to seven months of instruction using the WANDAH system will not be surprising to those familiar with the persistence of poor writing skills and attitudes. In addition, the quantitative results were clouded by some motivational problems in obtaining posttest samples of writing from students toward the end of the school year. Many students had recently taken standardized tests, were finishing up writing projects in classes, and were anticipating the end of the school year. In addition, the

writing prompts were not given as regular class assignments to be read and graded by the students' teachers. The extent to which these testing conditions affected the quantitative assessment results is unclear. Despite this possible confounding of the quantitative results, they do not contradict the findings from the site visit interviews, and those were strongly and consistently positive.

WANDAH Made Significant Contributions to Educational Productivity

In conclusion, the results from the statewide evaluation indicate the WANDAH projects did make significant contributions to educational productivity. The quantity of writing instruction and the amount of student writing increased and, especially when writing on the computer, the quality of students' writing and their attitudes toward writing improved.

ADDENDUM TO THE EXECUTIVE SUMMARY
Recommendations for Implementation of Projects and for Evaluation

Based on information from the on-site visits and the experience with the quantitative testing for the statewide evaluation, the following recommendations are made for consideration by USOE staff. The recommendations fall into two categories: (1) the implementation of projects to use computers in teaching writing, and (2) the evaluation of projects to teach writing with computers.

Project Implementation

Several recommendations in regard to the implementation of future WANDAH projects, or projects using other systems to teach writing using computers, have emerged from the statewide evaluation. First, the positive conclusions in regard to the effects of the WANDAH projects, supported strongly by the information gained from on-site visits and moderately by the quantitative data, lead to the recommendation that school districts be encouraged, and state funds be used if possible, to initiate more projects to use computers in writing instruction.

In encouraging additional writing lab projects, however, it is clear that careful planning and preparation are essential. In particular, it should be noted that the midyear, preliminary reports from the various WANDAH projects were highly complimentary of the three-day summer workshop provided by Logan WANDAH project staff. The importance of such a workshop, conducted by experienced writing lab users and emphasizing both process writing and the effective use of computers in writing instruction, was reinforced by numerous spontaneous comments by teachers during the on-site visits. The only concern expressed was the brevity of the workshop. Similar workshops, perhaps of longer duration, should be provided for project staff (project directors,

teachers, full-time adult aides, and principals) prior to the initiation of new projects.

The presence of a full-time writing lab aide appears to be essential to the successful implementation of computer writing labs. It is recommended that USOE not fund projects for the use of computers to teach writing unless a full-time writing lab aide is included in the project plan and budget. And, schools that are considering establishing computer writing labs on their own should be encouraged not to do so unless they are able to provide a full-time aide. Based on the experience of WANDAH project schools, as conveyed during site visit interviews, the writing lab aide may be either a professionally trained teacher or a qualified paraprofessional. There may, however, be some reason to prefer the former because of the additional assistance with writing which such an aide is more likely to be able to provide to students.

Finally, the implementation of a coordinated process writing, computer writing lab program in schools in Utah would be enhanced by a flexible, statewide, inservice education program. Based on the interviews with teachers during site visits, there are several areas in which some teachers need assistance. One is the teaching of process writing. Hopefully, many teachers will participate in the Utah Writing Project or take a college, university, or district inservice course in process writing. But many will not. For some of those, inservice courses to supplement a brief preliminary, workshop, such as was provided in Logan last summer, could be an important ingredient in successful implementation of process writing and use of the WANDAH system in writing instruction.

A particular area in which teachers need inservice assistance is the use of student review, or critique, groups as part of process writing. There was

considerable variability among the WANDAH project schools, and among teachers within schools, in reports of the efficacy with which student review groups were being used.

Other areas of potential inservice education surfaced during the site visit interviews. Some teachers need assistance in teaching grammar informally as problems arise in students' writing, rather than through the formal classroom instruction to which they have been accustomed. By the same token, some teachers are having difficulty integrating the teaching of literature and writing, and need assistance in that regard.

Not all of the personnel in each computer writing instruction project will need training in all, or any, of these areas. Each inservice course or workshop might be offered at a central location, such as the USOE offices in Salt Lake City or a geographically convenient school, for project teachers who have been identified as needing assistance in a particular area. Although other language arts teachers might benefit from such inservice courses, they would be particularly important for the productivity of computer writing-instruction projects.

The spontaneity of teachers' comments about needed additional training during the site visit interviews indicates the need for a system to identify ongoing inservice needs and provide flexibly scheduled inservice training for the teachers involved in computer writing lab projects. Such an inservice program could do much to ensure the success of USOE's efforts in that productivity area.

Evaluation

Research conducted in the field to gather evaluation data is nearly always fraught with difficulties, often unexpected and sometimes

unanticipatable. Those difficulties make the drawing of conclusions from the findings risky, as in the statewide evaluation of the WANDAH projects. Gathering of qualitative information (from the site visit interviews) as well as quantitative data (from the writing samples and edited surveys) provided, as was anticipated, important additional information. It also provided the opportunity to determine whether findings from different types of data would corroborate one another, as they did to some extent in this evaluation study. In fact, interpretation of the quantitative findings would have been difficult without the context provided by the site visit interviews. It is recommended that future evaluations of projects to use computers in writing instruction include qualitative, as well as quantitative, data gathering procedures.

Particular credence has been given to the qualitative data because of questions that arose about student motivation, particularly on the posttest writing samples, and the validity of the quality of writing measures, particularly in regard to the likelihood that an instructional innovation would have an observable impact on students' performance on such measures in less than a school year. Questions and issues in regard to the testing were raised during the site visit interviews, as well as by the indications from project staff and the posttest results of less-than-optimal student incentive to perform well on the posttest. These lead to a series of recommendations in regard to testing and design for future evaluations.

Testing

Among the issues raised by project staff, at USOE meetings and during site visit interviews, was that of the validity of holistic scores to assess quality of writing: Could projects be expected to have an impact on such a

general measure of quality within less than a school year; and, is a writing exercise conducted in one brief setting an appropriate assessment of the outcomes of process writing instruction?

The question of potential lack of impact due to brevity of treatment can only be answered by assessments following more extended student use of computers for writing. On the other hand, the challenge to the validity of a writing assignment that is not explicitly of a process-writing nature (allowing for pre-planning, considerable time to think about and make revisions, and even the opportunity to have one's writing critiqued by others) raises a different issue.

It is not clear that writing assessments must follow the process writing procedures used in language arts classrooms or duplicate the ideal setting for process writing to be valid. In fact, it is appropriate to ask whether students who have been taught to approach writing from a process perspective can, as a result, organize and present their thoughts better when presented with a writing task similar to those that they may confront in "real life", such as writing essays for course examinations. Long-term process writing instruction should help students to write better even when they do not have a period of days over which to develop a composition. Because brief writing samples scored holistically are commonly used and regarded as valid indicators of writing quality, it is recommended that such assessment be used, with other dependent measures, in future evaluations of projects to use computers in writing instruction.

The revision writing sample was an effort to move further in the direction of process writing by allowing students the opportunity to consider overnight the revisions to be made in a piece of writing. An opportunity to reflect for twenty-four hours is still not an accurate depiction of the

process writing approach. How to structure a writing assignment that teachers will agree approximates process writing more closely and reasonably, while still being manageable for testing purposes and usable with control students, is a question worth pursuing. At the same time, it is important not to confuse the instructional process with the writing process. As noted above, that writing instruction from the process writing orientation takes place over a several-day period does not mean that valid assessments of the impacts of such instruction must either incorporate the same steps or take place over the same period of time.

Another testing issue raised by project teachers was whether a writing assessment in which students wrote with pen or pencil rather than on the computer was a valid assessment of project to use computers in writing instruction. Again, it is important not to confuse the instructional process with the assessment of desirable outcomes. In "real life", students will often have to write without computers, and it is reasonable to ask whether writing instruction using computers enhances students' writing skills in other, nonwriting lab situations. In fact, it seems crucial to ask whether students who have written with the WANDAH system can then make revisions and do editing without the specific help of the WANDAH aids.

Aside from the important question of generalization, the use of computers in gathering writing samples would raise serious practical concerns. Students in comparison groups who had not previously written on computers would be at a serious disadvantage, unless instruction in the mechanics of computer use was provided. In addition, it could be a serious logistics challenge to provide test administration computers for comparison group students in schools where computers were not already available. In short, it is recommended that, in future such evaluations, writing

assessments be gathered with students writing with pen and pencil rather than on computers.

Motivation to perform well arose as a serious issue in this evaluation project. There appeared to be several components to the lack of motivation: time-consuming testing, especially the two-period revision assessment, at a time when students had been taking standardized tests, had end-of-the-year class assignments to complete, and were likely suffering the general malaise commonly observed in schools toward the end of the school year; a feeling of lack of meaningfulness of assignments which involved writing to prompts which students recalled having written to earlier in the school year; and, coupled and compounded by the factors already mentioned, the lack of the incentive to do well that is provided by knowing that your teacher wil read and grade your writing assignment.

There is probably no way to avoid the testing problems that accompany the generally recognized drop in student attentiveness toward the end of the school year, but other modifications in testing could help to alleviate the motivational problems. In future evaluations that involve multiple (pre and post) testing of students, different prompts should be developed for each administration. These prompts should be carefully constructed to involve similar contexts for writing in terms of the writer's intended role, purpose, and audience. Further, teachers should agree that they will evaluate the students' writing samples; and the test administration instructions should make it clear to students that their papers will be so evaluated.

Making each writing assessment a regular classroom assignment might help to alleviate the motivational problem. But doing so might exacerbate another potential problem—that of variability in testing situations. Differences in the way in which writing assignments are handled by different teachers could

be particularly crucial with revision writing exercises, because the number of student revisions is particularly susceptible, as compared to holistic quality, to unwitting or intentional influence by teachers.

If funds are available in an evaluation project, experience with this year's project indicates that writing samples should probably be administered by trained evaluation staff, rather than by the regular classroom teachers. Even then, however, it would be crucial for students to know that their writing will be read and evaluated by their teachers. The use of nonproject personnel for test administration does raise cost considerations, especially with revision exercises where the test administrator would have to be present in the school on two different days. If relevant writing samples are already being gathered and scored by the school district using standardized procedures, that provides an excellent source of inexpensive valid data.

Some specific suggestions in regard to revision writing exercises came from the readers who scored the student revision papers for this project. One difficulty was that, despite instructions, students often made erasures when they revised their papers, rather than just inserting revisions. It is important, therefore, that students either use ink or be monitored carefully so that they will not delete their original writing. In the revision exercise for this project, students were asked to write originally on every other line and then insert revisions between the lines so that they could be readily recognized. Identification and scoring of revisions would be much easier if, in addition, students made their corrections using a colored pencil or different color ink than was used originally. In a few cases, rather than inserting revisions, students apparently misunderstood the instructions and completely rewrote their compositions, making the

identification of revisions extremely difficult. This, too, calls for careful monitoring. Monitoring carefully to be certain that students write either with a dark lead pencil or in ink would also be of great help to readers.

Design

The time consumed and motivational difficulties created by repeated writing assessments need to be considered in designing future evaluation projects, based on the experience with this project. In multi-year evaluations, a pretest should be administered only at the beginning of the first project year, followed by posttesting at the end of each succeeding project year. Exploration of the data in succeeding years will determine whether the best covariate is the initial pretest or the posttest from the previous year. For example, if the eleventh graders from the 1985-86 WANDAH projects are to be assessed as twelfth graders to determine more long-range impacts of writing with WANDAH, it is recommended that another "pretest" not be administered at the beginning of the 1986-87 School Year. Instead, the pretest data for the first project year should be used. This has some potential difficulties, given the low pretest-posttest correlations, except for the attitude scales, for this year's project. However, to the extent that those low correlations were due to motivational problems on the posttest--which would be alleviated to some extent by the use of different prompts and by avoiding pretesting--they are preferable as covariates to this year's posttest scores. "Pretesting" at the beginning of the project year does not seem advisable in light of the attitudes toward testing already expressed by students.

Some form of multiple matrix sampling might also be considered for future evaluations. In this testing design, all project students do not take

all tests, but are randomly assigned to groups which are then randomly assigned to tests. Multiple matrix sampling has the advantage of reducing overall student time spent in testing. It has the disadvantages of not allowing for the pooling of test scores--such as was done with the "Increased Homework" and "An Influential Person" holistic scores from this year's assessment--and of making analysis more difficult.

A more radical design recommendation comes from the concern expressed by a few teachers and one principal that, despite the positive elements of the WANDAH writing projects and the process writing orientation underlying them, the de-emphasis of teaching grammar and usage formally might have negative effects on ACT or other standardized scores. A sound, but not widely used, research design--the time series design--could be used with archival data (that is, test scores available in district and USOE files) to deal with that question, and perhaps to deal with other questions of project impact, depending upon the standardized test scores which are available.

With a time series design, the pattern of performance following an innovation, such as the WANDAH projects, is compared against the pattern of performance prior to the innovation. In the case of ACT scores, testing information for classes of twelfth graders prior to the involvement of any students in a WANDAH project would be obtained from school records. At least three years of data should be available, with at least five years preferable; then, a minimum of three years, and preferably five years, of data following introduction of the WANDAH project would be accumulated. Data points (mean scores) would be plotted on a graph and the slope examined to determine whether any change occurred following introduction of the WANDAH project, the direction of any such change, and its duration.

Time series designs should not be used for post hoc interpretations. That is, it is not appropriate to look at a set of data points to determine when a change occurred and then attempt to infer the reasons for the change. It is usually recommended that the nature of an anticipated change be predicted prior to examining the data points. In this case, although predictions of direction might not be made, it would be clear at what point the introduction of the WANDAH project occurred, making it reasonable to examine the data points to try to discern project effects.

With WANDAH projects in several schools, graphs could be plotted for each school. Slopes could be examined for similarities across project schools, compared against data from nonproject schools, and compared against state data to determine whether any trends observed were general trends that would have occurred without project intervention.

The time series design has the advantage of using test information that can be gathered without project interference with regular school schedules. The information is relatively easy to gather from school records, and does not have to be gathered prior to project initiation. Moreover, any writing-related standardized test scores which are available in school records could be used to provide insights into the impact of WANDAH projects. A major disadvantage is the time span necessary before reasonable conclusions can be drawn, because data points must be accumulated over several years in order to be certain that the trends observed are reliable. Nevertheless, the time series design has been found to be a very useful approach to assessing the effects of institutional changes which are not easily susceptible to study through traditional experimental designs. USOE staff might give serious consideration to the use of time series designs in evaluating the effects of WANDAH projects.

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INTRODUCTION

During the 1984-85 School Year, the Utah State Office of Education (USOE) funded a productivity project in the Logan School District to apply technology to instruction in writing, using the WANDAH (Writing-Aid and Author's Helper)* computer writing system. Evaluation results at the end of the year were positive, and USOE funded seven additional projects to introduce the WANDAH computer writing system in Utah schools during the 1985-86 School Year. The 1985-86 projects were in seven school districts (listed in Appendix A) and the Northeastern Utah Educational Services Region (NUES).

The proposal for each WANDAH writing productivity project contained provisions for a third-party evaluator. In addition, USOE decided that there should be a statewide coordination and supplementation of individual project evaluation efforts. The purpose was not to supplant local evaluations, but to obtain some consistency in the data gathered across all of the projects and to provide for some statewide synthesis and interpretation of findings.

Evaluation at the statewide level was to address the following questions: (1) Did the quality of writing of students using the WANDAH system show improvement beyond that which would be expected in traditional writing programs? (2) Did use of the WANDAH system have an effect on students' attitudes toward writing? (3) Did the WANDAH productivity writing project have an effect on the school districts' writing programs and on the staff? (For example, would the teachers feel that their teaching loads were lightened or increased by the use of WANDAH?) (4) Would there be any cross-

*The WANDAH program is now published by Harcourt, Brace, Jovanovich under the title HBJ Writer. However, the former name is used in this report.

curriculum effects from the WANDAH projects, such as increases in the quality of students' writing in nonEnglish courses? (5) If any differences in improvement in the quality of student writing could be detected from project to project, would there be factors such as the philosophy of the writing program, the extent to which the use of computer technology was embedded in a sound philosophy of process writing, teacher experience and attitudes, and the conditions of adoption and implementation that were associated with the differences? (6) Did the use of the WANDAH system have any effect on student-teacher ratios? (7) Did the use of the WANDAH system have any effect on space utilization?

On October 2, 1985, a meeting of project directors and third-party evaluators was held in Salt Lake City at the USOE offices. At that meeting, the role of the statewide evaluator was explained, emphasizing that the purpose was to coordinate and supplement, not to substitute for, local evaluation. The cooperation of local project directors and third-party evaluators was sought and received.

In anticipation of a statewide evaluation effort, USOE had arranged to have a writing sample administered to students in the project schools in May 1985. It was agreed at the October 2 meeting that the students who had been included in that initial assessment would constitute the accessible population for any further data-gathering, and that a sample of approximately 25% of that population would be selected randomly for data analysis. It was also agreed that scoring of the assessments for the samples drawn from individual schools would be arranged by the statewide evaluator and the scores returned to individual project third-party evaluators for use in preparing their final reports, as well as analyzed by the statewide evaluator for a report for USOE.

It was agreed that two types of information would be gathered for the statewide evaluation: (1) Information from users--English teachers, students, project directors, principals, and nonEnglish teachers--during visits to the project sites; and, (2) quantitative data on writing ability and attitudes, obtained through writing samples and opinionnaires administered to the students by local project personnel. The first type of information was viewed as particularly important because of concerns that the duration of the projects might not be sufficient to have an effect on assessments of general writing ability, because there might be effects that would not be detected through quantitative assessments of writing ability and attitudes, and because information gained from personal interviews with users would be an especially fertile source of insights into the impacts of the projects.

Each project third-party evaluator produced a midyear preliminary report based on guidelines prepared by the statewide evaluator (see Appendix B). The statewide evaluator integrated the project reports into a preliminary report submitted on January 24, 1986. (A copy of the Executive Summary of that report is included in Appendix B.)

At the time of the preliminary report, the Northeastern Utah Educational Services Region (NUES) project had been encountering difficulties with its telecommunications system for information exchange with the three geographically remote project schools (Tabiona, Manila, and Rich). The telecommunications system was not yet operational as of January 15, 1986, and due to the lateness of project start-up, it did not seem worthwhile to conduct outcome assessments or site visits there. (That project was also to be evaluated as part of a telecommunications productivity project.) After consultation with NUES and USOE staff, the NUES project was dropped from the

statewide evaluation. The following report is, then, based on seven school district projects, one of which, Logan, was in its second year of WANDAH use. The results of the site visits are presented first, followed by the more perplexing results from the statistical analyses of student assessments.

SITE VISITS

Site visits were conducted at the six project schools from April 10 through May 9, 1986. (See Appendix A for the schedule for site visits.) The site visits were each one school day in duration. They were conducted by the statewide evaluator and a graduate assistant who is a student in the Curriculum and Supervision Ed.D. program at USU and has several years of secondary school teaching experience. A letter was sent to each project director to set a date for the site visit and indicate what was expected (see Appendix C). Several telephone calls to firm up arrangements were necessary as well.

At each site, the site visit team arrived one half-hour before school began to confirm arrangements for the day and make any necessary adjustments. The entire school day was spent on site, except for two smaller schools where the site visits were completed an hour or so before the end of the school day. The statewide evaluator interviewed the principal of each school, the project director, and English teachers using the WANDAH writing system with their students. He also observed each writing lab in use. The graduate assistant interviewed students who were using the WANDAH writing system in their language arts classes and some nonEnglish teachers.

The interviews with students were conducted in groups of three or four in order to minimize student apprehension and to capitalize on the spontaneity of students' interactions as they discussed their reactions to

WANDAH. A few interviews with non-English teachers were also conducted with two or three persons at a time. All other interviews were individual to ensure privacy.

In order to be certain that appropriate questions were asked and to ensure consistency across interviews, the statewide evaluator developed a set of questions to serve as interview guidelines with each type of WANDAH user. (See Appendix D.) Responses were written down during interviews and summarized at the end of each site visit. The results are presented below by school in the order of the visits, and then summarized across all schools. In an effort to reduce redundancy, the reports are briefer for later visits.

Pleasant Grove High School

Five English teachers, including the project director, were interviewed at the Pleasant Grove High School. These teachers taught the full range of students—from college-bound to low achieving students who, while not in a special education resource room, were perceived as very unmotivated.

The overall reaction of the English teachers to the WANDAH project was positive. All agreed that the quantity of student writing had increased greatly with the use of WANDAH and that students were writing who had never done so before. More papers were being assigned, and students were writing longer papers. Even though the use of computers had been a novelty at first, the students' interest in writing on them was continuing. A teacher of previously nonwriting, nonacademically inclined students found that these students now wanted to write; and the computer triggered writing that was of interest to them, but that they would not have done otherwise--such as an essay on rock music or an assignment in which they wrote "letters to the editor" and letters to companies either complaining about or complimenting them on their products. Many of these letters were actually sent.

Not only had the length of students' writings increased, but they were making many more revisions using WANDAH. Teachers noted in particular that students seemed to be more accepting of suggestions for changes when they came from the computer. They thought this was because the students viewed the computer as more valid and more authoritative than the teachers. (Paradoxically, while students agreed in their interviews that they accepted suggestions for corrections from the computers more readily, they saw it as a matter of computer impersonality. That is, computer comments had no personal implications or overtones, nor were they confounded with the authority relationships against which students often react.)

The teachers commented that for the noncollege-bound students especially, the prewriting WANDAH aids, such as nutshelling, were particularly helpful, because many of these students had little concept of how to start to write. Teachers of the more academically oriented students did not use the prewriting aids very often, with prewriting often done in class before getting to the computer; they tended to have the students use the computer for revising. Some of the teachers were concerned that WANDAH did not offer a great deal for advanced writing students, and they would like to have had more sophisticated software. Although some teachers indicated that WANDAH also was restricted in its usefulness for certain types of papers, one teacher was enthusiastically using WANDAH for the writing of poetry. The principal of the school also commented on the excellent poetry he had seen, written using WANDAH by students uninterested in school who had in the past been nonwriters.

Although there was consensus that students were writing more, it was not clearly agreed that this necessarily meant increased loads for the teachers. At least two teachers did comment that they had to do more reading at home,

although papers now were much easier to read and correct than before. Three of the teachers also commented on the use of peer review groups, both as a good learning experience in writing for the students and as an assistance to the teacher in evaluating papers and providing corrective assistance to students. The use of peer review groups was mentioned commonly by the teachers and seemed to work very well at this school.

Along the same lines, most of the teachers agreed that they and their students had found WANDAH easy to use. Generally, it was agreed that the use of WANDAH was having a positive effect on students' attitudes toward writing, although there were frequently two or three students in a class who did not have keyboarding skills or who objected initially to writing on the computer. Generally, the teachers thought that students were finding out that writing did not have to be an unpleasant task, and that students across the academic spectrum were finding their use of WANDAH to be enjoyable and productive. Somewhat paradoxically again, although the teachers commented that WANDAH was often most productive and most liked by the slower students, in the student interviews it was usually the more scholastically inclined students who were most enthusiastic about the use of WANDAH.

All of the teachers agreed that they were teaching more writing and that students were writing more. There was also agreement that much less grammar was being taught formally in the classroom. There was not a strong feeling that students were learning less grammar, although on the part of some teachers there was a wait-and-see attitude. At least two of the teachers expressed concerns about the difficulty of teaching grammar individually to students as problems arose in their writing, and at least one thought that it might be necessary to move back toward worksheets to teach a foundation in grammar and mechanics before students began writing on the computer. The

teaching of grammar seemed to be perceived dichotomously by these latter three teachers, not as falling somewhere between total formal classroom instruction and completely individualized teaching. In contrast, one of the teachers who was very comfortable with less formal grammar instruction taught grammar individually to students based on their papers, and took class time to teach grammar as problems common to a number of students arose. One teacher did note that while the WANDAH system did not teach grammar, writing on the computer was prompting students to look more carefully at what they wrote.

By the same token, most of the teachers agreed that they were probably teaching less literature, perhaps one-third less. However, one teacher noted that he had not faced any dilemma in that regard. Another teacher noted that she was basically a writing teacher and if use of WANDAH led to a greater emphasis on writing, that was positive from her point of view.

There was some concern on the part of teachers that the writing lab schedule tended to dictate the curriculum. That is, what was taught in the classroom had to be shaped around when the class was scheduled to be in the writing lab. And, once in the lab, there was a press to keep the students working on the computers during the time they had there; one didn't want to stop even briefly for a class discussion when a common writing problem arose.

There was some optimism that with a year of experience behind them, the scheduling problems could be addressed more fruitfully in the second year. There also was a clear consensus that the availability of more computers would certainly help to alleviate the problem. With 19 computers in the writing lab, an entire class could not be on computers at once; even though the former classroom in which the writing lab is located is large enough to have work carrels on one wall, having a class split with some on the

computers and some off created some problems. The statewide evaluator observed that students on the computers were highly on-task, but that those at the study carrels were often carrying on what seemed to be nontask-related conversations while the teachers was moving from writer to writer on the computers.

In that regard, it should be noted that the teachers were unanimous about the significance of the assistance of the full-time teaching aide in the writing lab. She is a former teacher who is able to help students with writing as well as with mechanics of computer use. Although student aides were used as well, it was clear that the professional writing lab aide was a crucial component of the program.

All but one of the teachers agreed that implementation of the WANDAH project had led them to place greater emphasis on process writing instruction--in which students are engaged in preplanning, writing, critiques by others, and revision, often over a period of several days, in contrast to overnight, write-and-hand-in writing assignments. The one who disagreed had been converted to process writing some nine years ago and found WANDAH very compatible with what she was already doing. Having students learn to share writing through peer review groups was seen as an important part of that process. Two teachers commented that the switch to a process writing program was inextricably confounded with the implementation of the WANDAH project, and it was probably impossible to sift out the effects of each.

Students. Interviews with twenty-one students generally corroborated what the teachers had to say. A very high percentage of the students had positive things to say about their use of WANDAH, although, as noted above, those who tended to like school generally also tended to be more positive in their views. Of the WANDAH revision aids, the assistance with "be" verbs

drew a large number of comments, although many students simply commented that they thought that WANDAH in general helped them to be more clear and better organized in their writing.

A major concern among the students was simply a lack of time to work on the computer and the need for more computers. Those who had computers to work on at home often liked their own word processing programs better. And, some noted that WANDAH's word processing commands were too complex. That, is compared to other word processing programs; too many keying steps were necessary in using the program.

The students particulary liked the readability of the writing which they produce on the computers. They also found the revision aids to be helpful in general. The sentence length graphs were commented on frequently, as was the ease of making revisions using the word processing part of WANDAH.

Generally, the students thought that using the computer had had a positive effect on their attitudes toward writing, although two thought that it had led them to like writing less than before. Many commented both on the fun and the convenience of writing with the computer; even students who said they did not like to write any better said they would rather write on the computer than with pen and pencil.

NonEnglish teachers. A sign in the Pleasant Grove writing lab indicates that the computers are for "English Only" use. Interestingly, a number of the students commented that they would like very much to have enough computers available so that they could do writing for their other classes in the writing lab. (Students would often pretend to be working on English assignments in the writing lab in order to do writing assignments for other classes on the computers.) And, promoting more cross-curriculum computer

writing was one of the interests expressed by the principal of the high school.

Five non-English teachers were interviewed--three social studies teachers, a family life teacher, and a special education teacher. Three of the five indicated that they had noticed some impact on the quality of writing for their classes, and wished that the students could write on the computer more--because the printed copy was easier to read and because the computer-produced assignments had been revised more carefully. The non-English teachers would like to have more computers available for their students. A social studies teacher indicated interest in working during the summer with the English department head to implement more writing in social studies, although it was not clear how this would be accomplished given the limited number of computers.

Principal. The principal of the Pleasant Grove High School was enthusiastic toward the WANDAH Project. He cited a number of students of whom he was aware who had previously been nonwriters, but were now not only writing more but producing very fine poetry and other creative pieces. He saw much more student pride in their written work--because of the neatness of the printed product, and because they were able to do revisions beyond what seemed feasible with pen and pencil and received aid in checking their writing beyond what individual teachers could provide. He was particulary enthusiastic about the peer conferencing part of process writing. It also was his opinion that teachers in other curriculum areas were noticing what was going on in the writing lab, and were beginning to want to be involved, understanding that writing is not just the English teachers' responsibility. It was his belief that this across-the-curriculum involvement in writing was drawing the teachers together into a more cohesive staff.

The principal commented that, in terms of productivity, it was relevant that students who had never written before were now writing more and longer pieces. Also, with the computers and the writing lab aide, students were receiving an increased amount of writing instruction with the same number of teachers.

The principal cited excellent support from parents. He estimated that he had received over 100 calls from parents indicating how pleased they were that their students seemed to be able to express themselves better and were eager enough about writing to go to school early to use the writing lab. He noted that when funds were available from the district for only a one-half time writing lab aide, there was a contribution from the community for the other half of her salary; and another $1,200 was contributed by parents for purchase of supplies for the writing lab. Somewhat paradoxically, while the project director felt that the support had been excellent from the school administration but less than desirable at the district level, as indicated by the failure to provide a full salary for the writing lab aide, the principal noted that at the district level there was sufficient enthusiasm that writing with computers was going to be introduced in two more schools during the coming school year.

In general, the interview with the principal was infused with enthusiasm for the WANDAH project and for the English teachers and their commitment to teaching writing.

Summary. Pleasant Grove teachers, students, and administration clearly feel very positively about their WANDAH project. Students, when asked, were unanimous in saying that they would not want to lose the lab from the school. All agreed that students are writing more and that the quality of writing is improving, although it is not clear that the quality is transferring to

noncomputer writing. Student attitudes toward writing—at least willingness to write--have improved. There has apparently been some decrease in the teaching of literature and in the formal teaching of grammar. But the belief was expressed that as writing and literature are further integrated, more literature will be taught; and there was optimism that students were, despite less formal teaching of grammar, probably learning more as the computer involved them in revising and as teachers responded to individual writing problems. The generally positive tone of the responses during the site visit was signified by the frequent comment that the major problem was simply not having enough computers available for student writing.

Spanish Fork High School

The Spanish Fork WANDAH project contrasts with the Pleasant Grove project in several ways. One has to do with facilities. Where the Pleasant Grove writing lab is located in what had been a classroom, the Spanish Fork writing lab is located in a corner of the library, set off from the library by a nicely finished partition with windows in it. Also, the project director is the librarian, rather than an English teacher. In addition, the Spanish Fork teachers saw themselves as having been largely a process writing department prior to the project; so the WANDAH project brought little change, as it was compatible with what they were already doing, which was in large part consistent with the State - Core Curriculum. During the interviews with five English teachers, including the department head, and with the project director, there were consistent statements that the teachers were very comfortable with teaching grammar through the students' writing, with few problems in combining individual teaching with classroom instruction as common problems or issues arose in the students' writing. The teachers

generally expressed the belief that they saw the teaching of writing and literature as complementary rather than competitive. That is, having students write as part of their study of literature was seen as fully appropriate.

In light of the above, there was another contrast with the Pleasant Grove teachers that was unexpected: The teachers in Spanish Fork did not appear to be as comfortable with peer review conferences and did not report using them as much. Two seemed less confident in the students' competence to critique one another's papers fruitfully.

The Spanish Fork teachers also seemed somewhat less concerned with an increased load due to the greater numbers of papers and longer papers to be read with students writing on the computer. One teacher in Pleasant Grove indicated that he had not found it necessary before to read everything that students wrote and that it was often appropriate to read and score students' writing holistically; several of the Spanish Fork teachers indicated that they, too, had not read all of their students' papers before, and that they still often read selectively (for example, for particular types of writing errors or to pick up consistent problems which individual students were having). And as with the Pleasant Grove teachers, the Spanish Fork teachers said that even though there were more papers to read, they were now much easier to read.

Teachers did comment that with large classes, often up to 40, it was a significant assistance to have a professionally trained person as a writing lab aide. They could send half of their class to the lab, and stay in their classrooms to work with the other half, knowing that the students would receive assistance with their writing, not just with the mechanics of

computer use. As in Pleasant Grove, students were generally on-task in the writing lab, and discipline was not a problem.

The teachers at Spanish Fork were also positive in regard to the impact of the WANDAH project on student writing. The students were reported to be writing more and longer papers, doing more revisions, and getting more assistance with the same number of teachers because of the computer, the teaching aide in the laboratory, and the greater flexibility of the teacher to move from student to student to provide assistance while they are writing on the computer. Some noted that student ideas were flowing better, even from below average and average students. And now, the revision part of process writing seems feasible to the students as they no longer have to recopy papers. Teachers at Spanish Fork seemed to find less use for the prewriting WANDAH aids and emphasized more the revision and editing aids.

As at Pleasant Grove, teachers were hard-pressed to think of any ways in which their students' writing might not have improved as much as it would have without WANDAH. There was a comment that some students were now less willing to write in the classroom without a computer.

The teachers saw a generally positive effect on students' attitudes, even those few who at first resisted writing on a computer. Now students are uniformly disappointed if they cannot do writing assignments in the writing lab. While one teacher noted that his college-bound students had particularly taken to writing with the computer, others commented that their less academically oriented students had done so, too. And at least one teacher expressed surprise at the students' willingness to write and to share their writing in and out of the lab.

While some concern was expressed about scheduling, there was less so than at Pleasant Grove; and although there were comments about the need for

more computers, fewer of them. In fact, there was an indication by the department head that at Spanish Fork they are moving "rather naturally" to more writing across the curriculum, that other teachers are already using the lab, and that students are encouraged to write their nonEnglish papers there. This is seen as a way of having students do more writing, which teachers believe will lead to better writing, and to do it with the advantage of the WANDAH aids, as well as to ensure fuller utilization of the lab because there are times during the day when the computers are not all in use.

Students. Observation of the writing lab by the statewide evaluator confirmed the teachers' comments that students were on-task a high percentage of the time while writing in the lab. As in Pleasant Grove, it was interesting to observe how unconcerned the students were as the statewide evaluator moved around the writing lab looking over their shoulders as they wrote. In fact, here as in other schools, students would often ask him for suggestions on their writing. (Teachers in general confirmed the evaluator's observation that students were rarely sensitive to having someone read over their shoulder in the writing lab, while in the same situation in a classroom, they would often cover their papers. This openness about their writing was frequently commented on by teachers as a positive aspect of the WANDAH project.)

Not surprisingly, the 22 eleventh and twelfth grade students who were interviewed at the Spanish Fork High School were almost uniformly positive toward the use of WANDAH and the computers. Their major concern was that there were not enough computers and not enough computer time, somewhat in contrast to the statements of teachers and the project director that the computers were not always fully utilized and more cross-curriculum writing

would be feasible. A majority of the students indicated that they were using the computers for writing in other classes.

Almost all of the students indicated that writing with WANDAH tended to relieve their writing anxiety and that they found WANDAH both fun and easy to use. In particular, they like the aids, such as with spelling and punctuation (interestingly, the "be" verbs aid was not mentioned frequently), and the ease of inserting, deleting, and moving about portions of their writing in doing revisions. Not only were the students unanimous about their desire to keep the lab in the school, but they clearly evidenced considerable pride in having it there.

NonEnglish teachers. Four non-English teachers were interviewed: a social studies-family teacher, a social studies teacher, a vocational agriculture teacher, and a health/PE teacher. All four were pleased to have WANDAH in the school, although one teacher thought that, inexplicably, her students made more spelling errors with WANDAH than they had before. All of the teachers would like to know more about WANDAH--not only how it works but how they could use it better for their writing assignments, and they would like to see more computers available in more areas of the school. At least a few students of each had done assignments on the computer, and all were pleased with the neat, more thoroughly revised papers which they received. In general, these teachers were pleased with WANDAH and wanted to learn more about it in order to utilize the writing lab better.

The project director teaches journalism and has found WANDAH to be extremely helpful there--with journalism papers easier to read and more likely to be handed in because students do not react negatively when told to "fix" something.

Principal. The Spanish Fork High School principal was very enthusiastic about the WANDAH project, after four years of effort to get writing with computers in the school. He would like to have at least four more computers to make it possible to implement an adequate writing-across-the-curriculum program with math, science, and history, as well as English. He noted that while there has been no change in class load or space utilization, the presence of the lab teaching aide allows the splitting of classes, so there are smaller student/teacher ratios at least part of the time. He also noted that the teachers claim that the quality of writing is better and that the few samples of papers he has read had good content and minimal spelling and grammatical errors.

He believes there has been good support for the project at the district level--including an excellent job of remodeling to provide the writing lab area, with half of the cost coming from district funds. There was good attendance during the Back-to-School Night and an open house for the lab; the few other parents' comments he has received have been positive. He expressed the belief that he had an excellent staff working with the lab and that, at this point, he could not see operating without the writing lab.

Summary. Although the reactions to the WANDAH project were somewhat different at the Spanish Fork High School from those at the Pleasant Grove High School, the overall response was again positive. The English teachers believe that the process writing orientation of the WANDAH Project and the State Core Curriculum fits well with what they were already doing. At the same time, there was some feeling that student response groups were not being used as often or as effectively as they might be. There was little concern about the displacement of literature due to an increased emphasis on writing or that the students' grasp of grammar would suffer through individualized

rather than formal instruction. There was agreement that students were writing more and better, and that they were enjoying it more. Interviews with the students confirmed that they found writing on the computer to be enjoyable and productive. Again, the principal was very supportive of both the staff and the writing project. The overall impression was one of enthusiasm for the WANDAH project, with a definite desire to extend writing-across-the-curriculum in the writing lab beyond that which had already been initiated.

Roy High School

The English teachers at the Roy High School have also given their writing lab an enthusiastic reception. Physically, the lab is located in what had been a double classroom. This lab also has a full-time aide; but at Roy, the aide is a paraprofessional rather than a professionally-trained teacher. Nevertheless, the teachers agreed unanimously the aide was essential--particularly so in the situation where there are not enough computers for every student, so that the teacher must often send part of the class to the writing lab while working with the other portion of the class in the classroom.

The eight English teachers who were interviewed (including the department head) expressed some concern about the work involved in switching to use of the lab. Units for the process writing approach were developed and, in addition, class schedules were set up for six-day writing periods. There were also comments about the problems in scheduling classes into the lab: It is difficult to coordinate writing instruction with scheduled time in the writing lab, with plans often having to be fit to the lab rather than using the lab when it fit one's writing plans.

The teachers were unanimous in the belief that their students were not only writing more, but that the quality of their writing had improved more than it would have without WANDAH instruction. As at the other project schools, the teachers gave specific examples of increased quality, such as sentences that are more complex, more variety in sentence length, better use of transition words, and greater attention to "be" verbs. Students seem to see their own writing problems more clearly on the screen or in type than they do in their own handwriting. Students now tend to do more revising, because it is so easy to do so without having to recopy. They also seek out others to read what they have written, which they did not do before. Moreover, the teachers observed that students are more likely to be aware of attributes of good writing when they are writing in the classroom. Teachers noted that the WANDAH computer program does not give answers to the students; but it does help them to think about the ways in which their writing could be improved and, in doing so, it is less personally threatening than is the teacher.

Several of the teachers commented on positive changes in students' attitudes. Many noted that not only the computer but the neatness of the printed page was motivating for the students. They found it easy for students to learn to use WANDAH, and students felt positive about that use and were often disappointed when they could not get into the lab to write. Students tend to be very much on-task in the writing lab, regardless of academic ability; and, there is usually close to a 100% hand-in rate on writing assignments done on the computer in contrast to much lower percentages when students write with paper and pencil.

There were some concerns about WANDAH--the number of key movements necessary to use the word processing part of the program, too few words checked by the spelling aid, and a transitions aid that is too limited to be

of much help. Several teachers distinguished between the word processing part of WANDAH and the revision and editing parts. They noted that the word processing tended to be excellent for the advanced students, although a little cumbersome to use, while the editing aids were of less assistance; for the less academically able students, they noted, the revision and editing aids—e.g., spelling, sentence length, "be" verbs—were particularly helpful. Although one teacher in Pleasant Grove was enthusiastic about the use of WANDAH for poetry writing, some teachers at the Roy High School expressed concern about the appropriateness of WANDAH for creative and poetry writing. The WANDAH prewriting aids were not widely used, because there was insufficient time to spend on prewriting in the writing lab.

The teachers generally reported assigning more writing; three believe that their work load has increased because they have more writing to read and they now analyze the students' writing more carefully. However, with the papers neater and more free of errors, reading does go more quickly. In addition, the teachers find the use of WANDAH exciting because they can work one-on-one with students as they write on the computer, and many of the students seem to be more self-directed and writing for personal satisifaction rather than just to fulfill assignments.

For the most part, the Roy English teachers reported either that they now teach grammar formally less often or that they have found little difference because they did not teach grammar formally before. One teacher is concerned about the possibility that students' ACT scores might suffer. Generally, however, the teachers were not concerned that grammar was being slighted and were optimistic that students would actually be learning more grammar as a part of process writing. By the same token, teachers did not

think they were teaching significantly less literature; and one said that he was teaching more by integrating writing and literature.

Teachers indicated that the emphasis on process writing in the district, by USOE, and in courses which some had taken recently was facilitated by WANDAH. For some, then, the emphasis fit with what they were already doing and WANDAH was simply a tool to help them do that better. However, for at least one teacher, a rather substantial change was involved from overnight writing assignments to a six-day writing cycle. One teacher noted that the use of peer reading groups was an area in which she could still improve to make the teaching of process writing more effective.

Overall, the teachers' reactions to WANDAH and the writing lab were very positive. The major concern was the need for more computers so that students could have greater access to them and so that availability of computers would not restrict curriculum planning.

Students. Twenty-four students were interviewed at the Roy High School, 13 eleventh-graders and 11 twelfth-graders. Nearly all of the students (there were three exceptions) said that they liked to use WANDAH for writing. The reasons ranged from the general development of writing skills to the assistance provided with usage, punctuation, and spelling, and the greater ease of revision. Some simply found use of the computer was fun and some enjoyed the break from regular English classwork. Those who were not enthusiastic typically had their own computers with word processing programs which they preferred.

The students thought that they were learning how to write better with WANDAH than they would have without, mentioning in particular their better organization of papers, and the "be" verb, sentence and paragraph length, punctuation, and spelling aids of WANDAH. And most students thought that

writing with WANDAH had helped them to write better even when they were not using the computer, in part because use of the computer built their confidence in their ability to write and helped them to enjoy it more, as well as to be better organized and more inclined to check their work. As in Pleasant Grove, some students commented that they thought that for them the computer was a better teaching of writing than the classroom teacher—because it was less intimidating and more impersonal, and because it allowed them to move at their own speed.

Although most of the students interviewed at the Roy High School appeared to be academically oriented, the project director commented that visitors to the writing lab were often surprised to see the range of students working there on-task, and to see the variety of students, many of them apparently nonacademically oriented, working in the lab after school. This general impression of positive student responses to the writing lab was confirmed by the interviews.

NonEnglish teachers. Three non-English teachers were interviewed at the Roy High School--a science teacher, a social studies teacher, and an art teacher. Two of the three indicated that their students do seem to write more and better now, and that they seem to do so with a better attitude. One commented in particular that the students seemed to like the lab and that she had not heard one negative comment about it. Two of the three said that some of their students did their writing assignments on the computer and all three indicated that they would like to have students doing so because of neatness and ability, as well as the greater potential for creativity which was cited by one. These teachers, too, wish that more computers were available so that students could have more time on them to write. Generally the three non-

English teachers responded positively to the program and its impact on the quantity and quality of their students' writing.

Principal. The Roy High School principal is clearly supportive of the writing lab. He noted that it is a place to which he typically takes visitors to the school because writing on computers using WANDAH has "turned the students on" and the positive effects are observable. He was not only of the belief that writing has become a more important, integral part of the curriculum with students writing more, but that there were beneficial "computer literacy" side effects, such as students becoming more comfortable with computer use. The excitement which he has observed among the writing staff in their use of the writing lab is of great importance to him; and he believes that that enthusiasm has infected the other staff as well, adding to an overall feeling of better school morale. He noted that there have been few reactions by parents, but this he saw as normal and as indicative of parental support as if parents feel negatively about something that is happening at the school, he usually hears about it. While there have been no changes in student-teacher ratios per se, with the full-time paraprofessional aide and the assistance provided to the students by the computer as they write, students are receiving more writing instruction than they had previously with the same number of teachers.

Project director. The principal's generally positive reactions to the lab were shared by the project director, the district language arts specialist. In particular, she noted that both junior high school and other senior high school principals have urged her to help them obtain a writing lab. She sees the impact of the WANDAH project as very positive, with more writing being taught more effectively. The increase in writing instruction has, in her opinion, led to a better balanced English curriculum because

there was little writing before, other than some journal writing and occasional research papers. Implementation of the WANDAH project has, she believes, led to much greater use of process writing by the English teachers. While they taught bits and pieces of process writing before, with little revision and some editing, the WANDAH project has helped them to "put it all together". The result has been that students also are learning revision strategies and seem to be internalizing what it is that makes good writing. They are more apt to pick up such things as "to be" verbs and sentence length variety on their own.

Summary. Again, the response to a WANDAH project was very positive. Although teachers and students expressed a few reservations, generally they like teaching writing and learning to write with WANDAH and the computer and would be distressed to see the writing lab disappear from their school. To the contrary, the common desire is to have more computers so that there will be more time available for students to write on the computer and to make it easier to integrate writing with other aspects of the language arts curriculum.

Mountain Crest High School

Seven English teachers, including the project director, were interviewed at the Mountain Crest High School. Mountain Crest is the only WANDAH project without a full-time aide (actually, with no paid aide) in the writing lab. That lack of assistance was a central concern throughout the interviews. With 20 computers and classes of up to 40 students, it is necessary for teachers to split their classes for writing lab use, with half of the class left in the regular classroom. Extreme frustration was expressed in regard to the difficulty of covering both sections of their classes adequately.

Teachers were reluctant to leave students alone in the writing lab, both because they needed assistance and because of concerns about the safety of the computers and printers. At the same time, teachers hesitated to leave students alone in the classroom because that time was frequently not spent productively and could even result in destructive horseplay. Although community volunteers had been used as lab aides, having temporary people without educational backgrounds often seemed to create as many problems as were solved. That is, teaching them to assist the students, and helping them to do so, sometimes took about as much time and energy as it would have taken to work directly with the students.

All of the teachers felt very positive about the potential of the WANDAH project. For example, one teacher of remedial students said that students who would not or could not write before were now writing up to 14-page essays. And, she is amazed at the creativity of the remedial students when writing on the computer.

As at the other schools, the neatness of the papers, the ease of revision, and the editing aids were viewed positively by the teachers, as well as by students, because they made papers so much easier to read. Again, there was a feeling that students who wrote with WANDAH were learning better organizational skills and learning better how to approach the writing task.

Approximately half of the teachers reported that they had been using a process writing approach before, and found WANDAH to be very helpful. For three teachers, the WANDAH project and particularly the preproject Logan workshop, had encouraged significant changes to process writing.

When queried in regard to the effect of the writing lab on workload, the universal comment was that the extra strain imposed by attempting to shuttle back and forth between the lab and the regular classroom without a regular

aide in the lab was a serious consequence. In fact, the inconvenience and instructional inadequacy of the situation was such that two teachers said that they simply were unwilling to use the writing lab. Two others commented that the students were very disappointed because the difficulties involved made them (the teachers) reluctant to use the lab. Teachers did comment that they now tend to spend more time reading papers written on the computer because they are longer and because they tend to look at the papers more carefully now that they are readable. As the project director pointed out, too, the computer provides direction for the students. But, there is no substitute for the teacher actually helping students learn, for example, how to replace "be" verbs with action verbs, how to write topic sentences, or how to correct run-on sentences.

The teachers reported that student attitudes were positive and that the use of WANDAH was appropriate for all achievement levels of students, although for different reasons: The lower achieving students find the editing-revision aids to be of particular assistance, and the higher achieving students find the word processing to be of most use.

The teachers generally thought that they were teaching about the same amount of grammar as before. The teacher of remedial students commented that she had to teach some grammar so that the students could understand the queries or the suggestions they received through the WANDAH aids. By the same token, it was thought that WANDAH was having little impact on the teaching of literature. Generally, there was a feeling that no imbalance had been created, because as at least three of the teachers expressed it, "There cannot be too much emphasis on writing." However, one teacher did say that with the eight-hour block at Mountain Crest to allow students to take more courses to meet increased state graduation requirements, resulting in 18

fewer contact hours with students per term, there was less time for reading. He tended to teach less literature.

Students. Twenty-one students were interviewed at the Mountain Crest High School. Most of them like the writing program, but less enthusiasm was expressed than during the previous site visits. One reason seemed to be that the program did not really get underway at Mountain Crest until December 15th, and students at Mountain Crest had not had as much time on the computers as those in Pleasant Grove, Spanish Fork, and Roy. The difficulty in using the lab due to absence of an aide also seemed to be a factor, with perhaps some spinoff from the dissatisfied teachers. Also, several felt that perhaps they had not been adequately prepared before going into the writing lab.

Only a couple of students said that they did not like to write on WANDAH, and one of those students lacked keyboarding skills. Most thought that they were learning to write better using the computer. The "be" verbs aid was frequently mentioned as a positive aspect of WANDAH, and reduced anxiety about and fear of writing were also mentioned several times. Students wanted more time on the computer. One student thought that the writing lab was having a negative effect, because the lab was used to impose too much work, from his point of view. Students did appreciate having neatly printed pieces of writing that had been revised more adequately.

NonEnglish teachers. Four nonEnglish teachers were interviewed--a social studies teacher, a biology teacher, a math teacher, and a resource room teacher. None had noticed any impact of WANDAH on the writing of the students in their classes or on their attitudes toward writing, yet all were positive toward the presence of the program in the school. Their students had not written assignments for their classes using the computer, but they

would like them to be able to do so, both because it would help the students to become better writers and because their writing assignments would be easier to read. The resource room teacher would like to have a pilot project using WANDAH for special education students, along with access to the writing lab for those students. Two of the teachers said that they had heard good reports from the students on the lab, but three of them commented that they were aware that there was a problem with the lack of an aide in the writing lab.

Principal. The principal of the Mountain Crest High School was supportive of the writing lab. He noted that students were on-task when he observed them in the lab, that he thought students' writing quality had improved, that students had made positive comments to him in the hallway about writing with WANDAH. The principal recognized the problems created by the lack of a full-time writing lab aide, and he was hopeful of finding funds for an aide for the next school year. He was not certain, however, that he, or the district administration, would be able to do so.

Summary. Although the English teachers at the Mountain Crest High School were appreciative of the potential of the WANDAH project and the writing lab, and the students in general liked working in the lab, the level of enthusiasm was not as high as that found during prior site visits. Certainly, a significant factor was the difficulties created for teachers and students alike by the lack of an aide in the writing laboratory. Many of the teachers interpreted the lack of funds for an aide as a sign of lack of support for the project by the school and district administrations. If the Mountain Crest project is to fulfill its potential, it must have a full-time aide as the other projects do.

Logan High School

The Logan site visit was of special interest because the WANDAH project there is completing its second year of operation. Five English teachers were interviewed, including the project director, who is also the department head. After two years, the teachers continue to be enthusiastic about the WANDAH project. They noted that in the second year of the project, some of the students' initial excitement over the newness of writing with computers had disappeared. Now the students tend to see the computer as a tool to use for English or nonEnglish writing assignments, rather than just "getting on" a computer for the fun of it. As one teacher put it, some of the original excitement, "the sparkle in the eye", is gone. Another teacher noted that a few students were beginning to actually be bored with the computer. But there was no sense that even though the students were beginning to see writing on computers as a routine part of their schooling, their attitudes or the effects of writing on the computer were becoming negative. There now was more focus on writing and less on manipulating the computer. As the project director put it, the experience with the writing center was like getting a new car: The fascination wears off and it becomes a part of life, no longer thought of as new, but still something that one would be lost without.

The teachers reported both increased quantity of writing—not only are more papers assigned, but students write longer assignments—and increases in quality compared to what would have been expected without WANDAH. Because students do not mind revising, papers are more accurately and carefully done, again in part because the students still enjoy writing on computers. As during the interviews in the other project schools, the English teachers cited specific indicators of increased quality in writing--such as more detail, better expression of characters' feelings and more vivid imagery,

more sentences that "sound right", better word choices, better use of transitions and verbs, better developed paragraphs, and more thoughtful writing.

According to the teachers, some students do get frustrated with what is often, at the same time, the most useful part of the WANDAH system, the word processing section, because of the number of keying steps that are necessary. Stude ts tend to use the prewriting parts of WANDAH very little. For some, the estioning and the beeping are bothersome. But prewriting tends to be done in the classroom, with the whole class, prior to going to the writing lab. Teachers also commented that the students liked peer review groups, including the suggestions they received for revising their papers.

The teachers have found WANDAH to be very compatible with and instrumental for process writing. There was agreement that WANDAH had helped them to become better process writing teachers, moving away from brief overnight writing assignments.

No concern was expressed by the Logan English teachers that use of WANDAH and the computers for writing had increased their teaching load. If anything, there was some sense of an easing of load because they had tended to assign a considerable amount of writing before and now the papers were much easier to read. Better papers were promoted both by the computer aids and by peer review, with students now willing to go through four or five drafts if necessary.

The majority of the teachers believe that they are teaching less grammar now; certainly, there is less formal instruction of grammar. Two teachers did wonder if the students will be as well prepared and if the lack of grammatical terminology might inhibit students' ability to think about their writing. All but one teacher also thought that they were probably teaching

less literature, although moving to the trimester system, one pointed out, had an effect as well. On the other hand, the teachers commented that they used literature for writing assignments and that perhaps those assignments were now more meaningful, making the teaching of literature more effective.

As in the other schools, Logan teachers were concerned with the problems of scheduling with only 20 computers available for use. There was the feeling that sometimes the "tail was wagging the dog", with the curriculum being fit to the writing lab schedule. But there was a general consensus that the benefits outweighed the disadvantages. Also, two teachers commented that the scheduling difficulties seemed to be easing in the second year and that they sense more flexibility in using the computers. Teachers are even willing to not send students to the writing lab when scheduled if they are not yet at that stage of the writing cycle. All of the teachers agreed that the full-time aide was essential to their use of the writing lab. The only reservation was that the aide was not available to help students in the lab after school.

Students. Of the 22 students (three ninth, 11 eleventh, and 6 twelfth graders) who were interviewed, all but one stated enthusiastically that they liked to use WANDAH for writing. Their biggest complaint was the limited number of computers, which meant that their time in the writing lab was restricted. Positive reactions to writing with WANDAH came as consistently from nonacademically-oriented as from academically-oriented students. Like the students at other schools, Logan students reported writing on the computer is easier and more fun, and they indicated that they are more eager to write with the computer--even one student who said that he previously "hated writing". The Logan students like WANDAH for the same reasons that students in other schools do: the ease of revision, the help with spelling,

punctuation, sentence length, "be" verbs, and prepositions. Students also commented positively on the peer reviewing of one another's papers.

Students reported that they were encouraged to use WANDAH in subjects other than English. Students who were now in their second year of use of the computer (the twelfth graders) were most active in looking for new applications, such as to write papers in nonEnglish classes. In the second year of the project, there was no sense of diminished student enthusiasm.

NonEnglish teachers. The project director at the Logan High School has actively involved nonEnglish teachers in writing, including a writing group that meets after school. Four nonEnglish teachers were interviewed--two mathematics teachers, one French-Spanish teacher, and a biology teacher. All thought that they had been able to observe the effects of the WANDAH project on their students' writing. Interestingly, both mathematics teachers had students write in the lab, writing out math problems and the thought processes involved in working the problems. The biology teacher also had used the writing lab with advanced placement students, and found that the students were much more willing to write when they could do so on the computer. The French-Spanish teacher had not used the computer because of the lack of availability of foreign language type, but yet thought that use of WANDAH had affected the students' grammar. She commented that she had never heard a negative comment from students or teachers about the writing lab.

Principal. Consistent with the other schools, the principal at the Logan High School is enthusiastic about the WANDAH project. The writing lab is located, as is all of the English Department, in a renovated elementary school which is immediately next to the high school. The writing lab is especially spacious and pleasant, and the principal was pleased that

excellent facilities had been available in the inherited elementary school building.

He noted the very active role of the department head and the assistant superintendent for curriculum in investigating WANDAH, obtaining permission to use it at Logan, and obtaining first year funding. It was a grass roots development of which he was very supportive.

The principal in Logan has not had a great many comments from parents about the lab, but believes that is normal when any part of the school is operating well. He always takes visitors to the writing lab, even if they have come to the school for some other reason, such as to observe the trimester system in operation. So, he is in the lab frequently and he likes what he sees. The students are on-task. He is particularly impressed by the students' willingness to share their own papers and to comment on others' papers, something he did not really believe would happen.

The principal said that he did not have much sense of the impact of the WANDAH project on the quality of student writing, although he knew that students were writing more papers and longer papers. He did wonder if students' ACT scores might not be a little lower as a result of the greater emphasis on writing. Nevertheless, he thought that overall the writing lab was the right way to go and there was no question in his mind as to whether he would encourage submission of the original WANDAH project proposal if he had it all to do over again.

Summary. After two years in operation, the teachers, students, and the principal associated with the Logan WANDAH project are still enthusiastic, even if that enthusiasm has been tempered somewhat. The newness of working with computers has worn off, and students seem to be accepting the computer now as a tool for writing. The teachers see WANDAH and the computers as very

helpful in process writing instruction, although there is some concern as to whether sufficient grammar and usage are being taught. No one would be willing to give up the writing lab, and the major desire in regard to the lab was simply to have more computers so that there would be more time available for students to write.

Park City High School

Just as the visit to Mountain Crest High School produced a contrast to the previous visits, so did the visit to Park City High School. The four English teachers using WANDAH, including the department head, were all positive but reserved in their appraisal of the WANDAH project. There appeared to be several possible reasons for the reserve. One is that the teachers generally thought that although WANDAH provided assistance, the process writing approach upon which it is based had already been an integral part of their teaching. One commented that the Logan Workshop prior to implementation of the WANDAH project made him realize how much he already knew about process writing. Another commented that based on what he had been doing in prior years, he could have "written the book" on process writing. And a third commented that he was hired at Park City High School because of his background and competence in process writing.

A second reason for some reserve might have been that the proposal apparently was not of "grass roots" origin. The idea for the WANDAH project originated in the superintendent's office and the department head was, "on rather short notice", instructed to have a proposal ready. The superintendent apparently played a major role in the writing of the proposal. Although the principal of the high school stated that the proposal grew from parents' expressions of need for attention to composition and writing, the teachers did not appear to be convinced.

Thirdly, Park City is a relatively affluent community and many of the students have computers in their homes. Moreover, there were already a number of computers—including a computer science lab and a business computer lab--in the school. So, the addition of the WANDAH writing lab was not viewed as particularly innovative, nor was computer use a new experience for many students.

Whether any one or all of these were factors, the English Department evidenced a rather independent attitude, close to suggesting resentment that some outside influence, such as the USOE, would believe that it could improve the department's language arts program. However, the hesitance about outside influences did not come across as negativism in regard to the WANDAH project, although again there was some reserve. One teacher noted that she was not sure whether her students' writing had improved even though their eagerness to revise what they had written had increased. Another thought that the products his students were writing had improved because of the increased emphasis on process writing. Before, the students seemed to have little idea of any process for writing. Ironically, that same teacher was concerned as to whether other teachers were teaching process writing, but all of the teachers said that WANDAH fit very naturally with what they had been doing.

It was also noted by a teacher that the students who were in the middle and lower levels in terms of writing skills were showing the most improvement because of the WANDAH editing and revising aids. For the very good writers, there was little improvement and some even wanted to type or write by hand rather than using a computer. But simply getting papers at all from the lower level writers was a significant improvement. These students love to work on the computer with WANDAH, this teacher said, and will make up work to do on the computer. They write more, their organization is better, they

produce more substance, and feel better about writing and are willing to put more time in on it.

Another teacher gave specific examples of the effects of use of WANDAH. A student who was not academically-inclined and had never written more than a two and-a-half page paper before would now work in the writing lab for two hours after school, producing papers as long as six pages. Another student who had complained about writing is now willing to write. And, another student who always wrote overly simply, now elaborates well.

All of the teachers agreed that the writing lab augmented their prior process writing orientation and made it easier to implement process writing. For example, one teacher noted that where before he was lucky to get two revisions out of students, now three or four revisions are common.

In terms of teaching load, the English teachers expressed little concern. One teacher noted that the WANDAH lab was a mixed blessing when it was necessary to split a class to send part to the lab. However, as other teachers noted, Park City has relatively small classes--25 students and under--and the additional writing that students did on the computer created few problems, as did the preparation for the split classes. At least one teacher used peer review groups as a means of providing students with suggestions for changes, while another teacher suggested that peer reviewing probably was not working well for him or for most of the English teachers.

All but one teacher thought that the use of WANDAH was not leading them to teach any more writing than they had before. By the same token, none of the teachers thought they were teaching any less grammar than before. All said that their grammar instruction had been primarily individual and informal prior to the WANDAH project. Similarly, while one teacher thought that the emphasis on process writing might be reducing somewhat the teaching

of literature, two said it was having no effect on the amount of literature taught, and one said he was teaching more because he taught literature to half of the class while the others were in the writing lab. One teacher emphasized that he used literature as the basis for the compositions which he assigned.

There seemed to be a consensus among the teachers that not all students were positive about their use of WANDAH, although most were. Some students ask when they can use it; others resist using it. The latter has been particularly true for students who have their own computers with word processing programs at home, and who find the word processing portion of WANDAH more awkward to use. At the same time, some students are frustrated by the lack of availability of computers, despite the fact that the writing lab is often open at 6:30 a.m. Again, interestingly, few students seem to find the prewriting WANDAH aids useful, and it did not appear that the teachers emphasize them. There had been some trouble with disks being wiped out by computer malfunctions, which created a high level of frustration among students.

Students. The responses of the 17 ninth through twelfth-grade students who were interviewed reflected those of the teachers. They were less excited about the writing lab than the students in any other school, except perhaps Mountain Crest. Many of them had computers in their homes and preferred the word processing programs which they had there. Moreover, there are other computers in the school with different, more easily used, and more preferred word processing programs. Most of the students indicated that they wanted to have the writing lab maintained in the school, but they were not as strong in their response as students had been in other schools. One student wanted the

WANDAH project taken out of the school—the first and only such response that the site visit team encountered.

Nevertheless, when asked if they liked using WANDAH for writing, all but three students said yes. Those who did not like WANDAH compared it unfavorably with the WordStar word processing program. Four students indicated that they did not think they had learned to write any better with WANDAH than they would have without. And, the students were about split when asked whether they thought that learning to write using WANDAH had helped them to write better when they were writing with pencil and paper or in classes other than English. Several students commented that they did like writing much better, that it was no longer painful or a hassle, something to be hated. The students cited very few specific WANDAH aids which they found helpful, in contrast to students in other schools.

NonEnglish teachers. Three nonEnglish teachers—a resource room teacher and two social studies teachers were interviewed. The resource room teacher had not noticed any impact of the WANDAH project on the writing that students did in his class, but would like to have them writing more on the computer. He thought that WANDAH is an excellent resource to have in the school. The social studies teachers noticed that students seem to be writing better since the WANDAH project. The students of both did writing assignments using the writing lab. While one was indifferent to whether the students did their assignments using the computer, the other preferred it because the assignments were so much easier and faster to correct. That same teacher also indicated that he thought that the students' attitude toward writing had improved with the WANDAH project and that he had heard nothing but positive comments from the students. Interestingly, too, that teacher commented that

the full-time aide, a professionally-trained teacher, was excellent, echoing what had been said by the English teachers.

Principal. The Park City High School principal is very supportive of his staff and enthusiastic about the project. He saw Park City High School as on the move to being a first class academic institution and felt that the increased emphasis on writing instruction was an important contribution. As noted, it was his belief that the proposal for the WANDAH project grew from parent concern with writing instruction, and he said that he no longer heard from parents that the school needed to be doing more with composition. It should be noted that even though he had thought there were ways in which the writing program could be improved, it was also his belief that before the WANDAH project, the program was, in many ways, already ahead of those in other schools.

The principal thought there had been more emphasis on process writing with the WANDAH project, and that teachers were willing to give more writing assignments because of the neat, revised copy which they received when writing was done on the computer. He also was very complimentary of the aide. The policy, he said, was that teachers were not to "dump" students in the writing lab, but were to have them prepared and to be in the lab as much as possible themselves. He thought that the ease of editing and revision had caused the students to be more knowledgeable and better technicians in their writing. He had no concerns that other parts of the language arts curriculum were being neglected as a result of the WANDAH project.

Summary. The atmosphere of the Park City High School reminded the statewide evaluator very much of that of an eastern private school. The student body is smaller than those of schools in the previous site visits, and there was not a great deal of imposed structure, with informality in

interactions between teachers and students, as well as between teachers. That observation is not intended as a criticism, but as a further indication of the independence in attitude that might have contributed to a moderate reaction to WANDAH.

With reserve, the teachers agreed that the WANDAH project was helpful to students, particularly the lower academic achievers, and that it was having some positive influence on students' writing and on their attitudes toward writing. The students, too, were moderate in their enthusiasm, with many of them preferring to use the word processors which they had at home or that were available elsewhere in the school. The principal was very supportive of his staff and was pleased by the additional emphasis on writing encouraged by the WANDAH project. It seemed clear that while WANDAH was a generally, if not warmly, welcomed addition to the school curriculum, the situation at Park City could not be typified as one of great enthusiasm toward or of great impact by the WANDAH project. Nevertheless, there was certainly not a sense that teachers or students, with one exception, would be anything but unhappy to see the writing lab disappear.

North Summit

In contrast with all of the other WANDAH projects, middle school as well as high school students are part of the North Summit project. North Summit also has the smallest student population of any of the districts that have project schools. One teacher in the middle school, who is also the project director, is responsible for the writing instruction of the seventh and eighth-graders, all of whom are in the WANDAH project; at the high school, two English teachers were involved. The contract of one of the high school teachers is not being renewed for the coming school year, creating another

contrast with the schools which had been visited previously and a morale factor which needed to be taken into consideration during the interviewing. All three teachers were interviewed during the site visit.

The middle school teacher noted that there is nothing in the WANDAH system that seventh and eighth-graders cannot use at their level of sophistication, although with seventh and eighth-graders, the teacher could not tap the full potential of some parts of WANDAH, such as the prewriting aids. She is looking forward to finding out what happens when students who started using a process-oriented computer writing program in the seventh and eighth grades reach high school.

The middle school teacher was particularly pleased because the students stayed on-task when writing on the computer, and 100% of the computer assignments were handed in. With handwritten assignments, even if class time is given to the students for writing, a great many assignments do not get completed.

Perhaps the biggest advantage of WANDAH, from this teacher's point of view, is that it makes the students conscious of what they do when they write. For example, when they first used the "be" verbs aid, students were appalled at the number of nonaction verbs in their papers. The sentence length graphs and the word usage aids also make the students much more aware of what to look for in good writing.

Although this teacher was not certain that the students' writing had improved because of WANDAH, it certainly made writing much more exciting and much more of interest to them. She found that the students particularly liked the parts of WANDAH which helped them to evaluate pieces of writing. They would even put the principal's memos on the computer, analyze them for "be" verbs, sentence length, and so forth, and return them to the principal

(which, it was clear during his interview, he took with a great deal of good humor).

The basic attitude change is that the students are more eager to write; but that eagerness did not necessarily transfer to writing with paper and pencil. And, the students still do little revision when not on the computer. They know the things to look for, but do not necessarily do so. Or, perhaps, the teacher noted, it is simply not as easy to revise when they are not on the computer, and so they don't.

The WANDAH project increased this teacher's emphasis on prewriting. Knowing that the students needed to be prepared when they got to the writing lab, and that the students themselves wanted to be ready, much prewriting was done in class. She had the students use the prewriting part of WANDAH once, but the students did not particularly like such things as flashing lights as signals during prewriting exercises. In any event, there was not sufficient time in the writing lab for much use of the WANDAH prewriting aids.

The emphasis on process writing had led, she believed, to less teaching of grammar, and she was concerned. This teacher is still struggling with whether working on grammar in the context of the students' own writing will substitute for formal instruction at this grade level. She is not convinced that what the students are learning about grammar and usage in English is carrying over into writing in other curriculum areas. The emphasis on process writing has not had an effect on the amount of literature this teacher teaches. She believes she had never taught enough literature and still does not. A serious difficulty is finding appropriate literature for this age level that doesn't take too long to read; then, it is difficult to mesh the reading with writing assignments on the computer. As a consequence, she felt no particular imbalance in the language arts curriculum as a result

of the WANDAH project; but she worried that the Utah State Core Curriculum might be overbalanced toward writing, although writing is clearly of great import and should be central in the language arts.

She did not believe that her work load had become any heavier as a result of the WANDAH Project. She had been using process writing before (as a prior participant in the Utah Writing Project), so WANDAH complemented what she was doing--and students' papers are easier to read. She also found that it was easy for her middle school students to figure out how to use WANDAH.

Scheduling presented the greatest difficulty, with only twelve computers in the lab. She can send only one-third of her class to the writing lab at once, and students usually go to the lab every third day during the two weeks at a time when she is scheduled for lab use (a cutback from the original three weeks, due to belief at the high school level that two weeks there was insufficient). More computers are clearly needed, in her opinion. And, the trained teacher who is the writing lab aide is vital.

The computers are located in a room in the high school (which had been the Special Education room) and middle school students have to walk across a street and approximately half of a block to the lab. However, this seems to create no particular problems. The middle school teacher noted that the students are so eager to get to the lab that, rather than dilly dallying, they usually run to get there. It seemed better to have middle school students, rather than high school students, moving from building to building.

At the high school level, one of the teachers had participated in the Utah Writing project earlier, and found WANDAH to be very complementary. This teacher thought that students were "opening up" as they never had before, and writing excellent papers. The other teacher, who also thought that WANDAH had reinforced a shift toward process writing instruction which

he had effected earlier, thought that a major advantage of WANDAH was that the students could now visualize what their writing looks like, making revisions easier. Both thought that students' writing had improved (and cited changes) due to the WANDAH project, with the volume of writing definitely up. Students are not only writing more assignments, but producing longer pieces of writing. Both noted the lack of time on the computer as a serious limitation, as is the press of having to be in the writing lab at scheduled times, which interrupts the flow of the writing process.

Both high school teachers indicated they had seen significant changes in student attitudes toward writing. One indicated that students now know that they can write and can be successful in doing so. The ease of revision is particularly conducive to good attitudes, he said. However, the same teacher found that for some students sitting at the computer is too regimented, and for some the process of handwriting itself seems to be important in writing. He also indicated that the students did not particularly like the WANDAH prewriting aids and that he rarely uses them. The other teacher noted that some students still do not like to write, but they are much less apt now to say, "I can't do it." This teacher also thought that better attitudes were carrying over to pencil-and-paper writing, and that students were doing better on writing essay questions in other classes. Both said that it was not necessarily "good" or "bad" students who liked or did not like writing with WANDAH.

One teacher thought that he was teaching less grammar than before and was bothered by that to a certain extent, in part because standardized tests do test on grammar. He also thought that using literature as the basis for writing had restricted the amount of literature that he taught. In contrast, the other teacher thought that the WANDAH project allowed him to do more with

the teaching of literature. It gave him more time to work with individuals and more time to discuss in class the literature used as the basis for writing assignments.

In terms of work load, one teacher thought that there had not really been any change; the other teacher agreed, but elaborated by pointing out that the products from the computer were much easier to read. He was concerned because he was still having difficulty using peer review, and spends a lot of time in individual conferences with students. Both high school teachers noted rather severe difficulties due to the lack of a sufficient number of computers in the writing lab, with only from one-third to one-half of the class able to be writing on the computer at any one time. And the problem was stated not only in terms of the difficulties of scheduling and planning what to do with students waiting their turn in the lab, but the inability to have students on the computers a sufficient amount of time for maximum learning. Again, the writing lab aide was mentioned as a significant positive factor.

Students. Twelve middle school students were interviewed and 10 high school students. In general, their reactions to the WANDAH project were positive and very similar to those of students at the previous schools. WANDAH (with the exception of Park City and Mountain Crest) received strong votes of confidence. Interestingly, the middle school students found it more difficult to express the specific ways in which WANDAH was helpful to them, even though they agreed that WANDAH was useful. Ease of revisions, the editing aids in general, and readability of printed copy were cited by students at both levels, while the high school students tended to be more likely to mention specific aids, such as sentence length graphs.

NonEnglish teachers. Three nonEnglish teachers, a math, science, and social studies teacher, were interviewed in the North Summit Middle School. All were positive toward having WANDAH in the school and would like to have their students do more writing on the computers.

Principals. Two principals were interviewed during the North Summit site visit, because of the involvement of two schools. Both were enthusiastic about the project, and both indicated, as the project director had, that the superintendent had been very active in preparation of the grant proposal for the project. The superintendent was interested in the application of computers to writing instruction at the middle school level. Nevertheless, the high school principal, as had the high school teachers, seemed to feel that middle school use of the writing lab encroached on the time needed for adequate high school instruction.

Both principals found parents to be very supportive. The high school principal noted that parents commented on their childrens' interest in writing and complained that the students could not get adequate time on the limited number of computers. The junior high school principal indicated that he took parents to the writing lab every opportunity he had, as well as mentioning it during parent conferences, and that there had been several articles and examples of student writing in the local newspaper. Both indicated that they would like to have a lab large enough and with a sufficient number of computers to be able to have an entire class in at once.

Both principals said that they definitely believe more writing is being taught and that students are more interested in writing and positive about writing on the computer, with excellent time on-task while they are in the writing lab. The middle school principal noted that writing on the computer has helped to bring about a greater emphasis on computers in both math and

science. Neither principal was concerned about any imbalance in the curriculum. Both were pleased to have the WANDAH project, although both expressed serious concerns about the limited time students had on the computers. Both indicated that the writing lab aide is crucial. The high school principal noted in particular that even though the student-teacher ratio is not affected directly, with the aide students do get more writing assistance than they would without the WANDAH project.

Summary. Based on the first year's experience in North Summit, writing with WANDAH does seem appropriate for seventh and eighth-grade students. Lack of keyboarding skills presented some problems at that level; but beginning next year, those skills will be taught in the sixth grade. Again, there was general overall satisfaction with the WANDAH project, despite considerable concern by teachers and administrators about the limited number of computers, and expressions by the students that they would like to be able to have more time to write on the computer.

Summary of Site Visits

Few educational innovations are appropriate for a wide range of students and for a variety of teachers. It was, therefore, somewhat surprising to find near unanimous enthusiasm for the WANDAH projects, albeit for different reasons from different students and teachers, during the site visits. Some teachers feel positive about the WANDAH project because it complemented the emphasis which they already placed on process writing; for others, the strength of the WANDAH project was the impetus it gave them to become process writing teachers. Some teachers like their WANDAH project because it is leading to greater emphasis on writing, which they thought was central to the language arts curriculum; others liked it because it helped them to integrate

writing with the teaching of literature and thereby strengthen what they were doing in that area. More able students tended to say they liked WANDAH because of the ease of revision with the word processing part of the system; less academically-inclined students, who were also less likely to be skilled writers, found the editing and revision aids and the neatness of the printed copy to be particularly appealing. The teachers' comments tended to corroborate the students' comments in regard to the relative merits of the WANDAH system for students at different academic and writing levels.

There was also unanimity among the teachers that the WANDAH project had resulted in greater quantities of writing by their students, both because they were giving more writing assignments and because the students were writing longer papers. And students are on-task in the writing labs. There was also agreement that the papers were much easier to read because they were in print and better revised and edited. All of the principals in the WANDAH project schools also said that greater quantity of writing had resulted from their WANDAH project, and all are pleased to have WANDAH projects in their schools. Principals commented that with the computers and the writing lab aide (absent at the Mountain Crest High School), students were getting more writing instruction even though the teacher-student ratio had not changed. This is considered to be an important indicator of productivity.

There were concerns. Not all teachers are convinced that teaching grammar informally and individually through student writings is feasible or resulting in adequate student learning. Nor do all teachers agree that the new emphasis on writing with the WANDAH project is not interfering with the teaching of literature. By the same token, there are a few students who do not like to write on the computer, because writing things out by hand seems essential to self expression, because they lack keyboarding skills, or

because they have access to other word processing programs that are easier to use. Some teachers would like more sophisticated computer writing software. Interestingly, few students or teachers have found the prewriting part of the WANDAH system to be useful—the students because their teachers often had not introduced them to it or because they were annoyed by blank screens and beeps; the teachers in large part because the limited time which students had available to write on the computers did not seem to be well used by time-consuming prewriting activities. Indeed, all of the groups interviewed--English teachers and project directors, students, principals, and nonEnglish teachers—agreed that more computers in the writing labs would be extremely desirable. NonEnglish teachers indicated that they would like their students to do writing assignments in the writing lab, and those in schools where such writing was encouraged generally indicated that they were looking forward to expanding across-curriculum writing using the computer.

Despite the generally surprising unanimity of opinion about use of the WANDAH system, there were contrasts. The site visit to the Park City High School is an example. The site visit there indicated that although WANDAH was a useful addition to the language arts curriculum there, computer-assisted writing instruction may not be as likely to receive an enthusiastic reception in schools in more affluent communities where computers and word processing programs are available in many homes and in other places in the school, or if the teachers do not feel involved in the decision to implement a computer writing lab.

The Mountain Crest High School, the only WANDAH project without a full-time writing lab aide, presented another contrast. Although not of benefit to the teachers and the students there, the contrast was perhaps fortunate for those planning other projects because it indicates the importance of

employing full-time aides for writing labs. The absence of an aide limited the use of the Mountain Crest writing lab by teachers who were well aware of its potential, and frustrated students, with a negative impact on teacher and student morale. Although experiences at two schools indicated that student aides can be helpful in writing labs, and while volunteers from the community may be helpful, a full-time aide is definitely an essential ingredient of successful writing labs. It is particularly helpful to have a trained professional teacher as a writing lab aide, because that person can provide writing assistance as well as computer assistance; however, a competent paraprofessional--another contrast fortunately provided by the Roy High School project--can clearly be of more than minimal assistance to teachers who must split classes. The presence of an aide also allows teachers to address writing problems, and not computer usage, when they are in the lab with students.

Despite the agreement about increased quantity in writing, consensus was not so clear in regard to increased quality of writing, especially when students were not able to use the computer for writing in English or when they were writing in other classes.

One further contrast is important: that is, the use of the WANDAH writing system with seventh and eighth grade middle school students in the North Summit school district. The year of experience there indicates that although seventh and eighth-graders cannot use WANDAH to its full sophistication and may not even be able to identify verbally some of the particular advantages it has for their writing, WANDAH use did appear to have a positive influence on the students' conceptualization of the writing task, the amount of writing which they did, and their attitudes toward writing--just as writing with the computer at the higher grade levels was generally

regarded by teachers and students to have a positive impact on attitudes toward writing, with students less apprehensive about writing, and with students who had rarely written before now writing and producing surprisingly creative assignments.

The site visits revealed some teachers' reservations in regard to the teaching of grammar and literature, generally limited use of the prewriting part of the WANDAH system, a few students' reservations about writing on the computer c .sing the word processing part of the WANDAH system, a reserved reception for the WANDAH project at one school, and difficulties at another school due to the lack of a writing lab aide. All of these indicate that the WANDAH system is not a panacea for teaching writing. Nevertheless, the site visits indicated that the users view the WANDAH projects as successes. This appraisal continues into the second year of the Logan project, where the computer has lost much of its novelty but continues to be viewed by teachers and students as a very useful tool for learning to write.

STUDENT ASSESSMENTS

In addition to the information from WANDAH project users gathered during the site visits to the seven projects, quantitative data on students' writing and attitudes toward writing were gathered as part of the statewide evaluation of the WANDAH system. Revisions by students, general quality of writing, and attitudes toward writing were assessed with eight dependent measures. Comparisons were made between WANDAH project students and nonWANDAH students at the same grade level and between students' pretest and posttest scores.

Design

As noted in the Introduction, a writing prompt was administered to students in the WANDAH project schools in May, 1985, in anticipation by USOE staff of a statewide evaluation effort. And, at the October 2, 1985, meeting of project directors and third-party evaluators, it was agreed that the students included in that initial assessment would be the accessible population for any further data-gathering. A sample of approximately 25% of that population was to be selected randomly for data analysis.

In order to have a comparison group for an evaluation study, a sample of students from the H High School was included in the May, 1985 writing sample. Prior to the October 2, 1985 meeting, no comparison groups had been arranged in other project districts. Efforts were made to obtain control students at the A and G High Schools. However, attrition of students from pretesting to the posttesting left so few students in the comparison groups at those two schools that it was not feasible to include them in data analyses. In one school district, the writing prompt which had been administered to the accessible population in May, 1985 was administered by the project third-party evaluator, in October, 1985, to students at the I and the J High Schools. That assessment provided comparison groups for a limited contrast with the B High School WANDAH project students.

The statewide evaluator drew the agreed-upon 25% sample from the project and H High School students who were included in the May, 1985 testing, as well as from the students tested at the I and J High Schools in October 1985. The sample sizes for the various schools, broken down by numbers of males and females, are presented in Table 1. All of the students in the project samples used the WANDAH system only during the 1985-86 School Year, even

Table 1

Sample sizes and numbers of males and females.

School	Grade 7	8	10	11	12	Total
A				9/3	10/6	28
B				9/9	7/7	32
C				13/13	14/15	55
D				12/12	11/4	39
E				12/12		24
F				12/12	10/10	44
G	7/7	8/8	8/7	8/8	5/1	67
H				20/20	17/17	74
I				20/20		40
J				10/10	10/10	40
Total	7/7	8/8	8/7	125/119	84/70	443

Note. The numbers of males precedes the slash, with the number of females after the slash. Also, H, I, and J are comparison groups.

though the E High School project was in its second year. The E High School eleventh graders included, as tenth graders, in the May, 1985 writing assessment had not used the writing lab during the project's first year, except for a brief one-period introduction in preparation for lab use as eleventh graders.

It should be noted that maintaining the 25% sample of those students who responded to the May 1985 writing prompt presented some difficulties. The decision at the October 2, 1985 meeting was to include in the sample students for whom data were available on all of six assessments (i.e., pre- and posttestings with two writing samples and an Opinion Survey). There is, of course, always a certain amount of attrition because students move or are absent on the day of a particular test. In addition, school staff were not always certain which students had been included in the initial writing sample. And, in at least one school, testing in individual classrooms rather than in large groups, as was done for the first writing sample, resulted in the loss of some students. Also, in one posttesting instance, four students were inadvertently given the pretest version of the attitudes instrument, and the items to assess attitudes toward writing with computers were missing. Also, the pretest attitude questionnaires for the B High School sample were misplaced and never reached the statewide evaluator for analysis.

When a total set of assessments was not available for a student, a replacement student was selected randomly, where possible maintaining equal numbers of males and females as in the initial sample. In some instances, maintaining that balance was not possible because of the limited number of students available. Random replacement also became difficult because of the limited number of students with complete data sets available from some

schools. To maintain the size of the H High School comparison group sample, four students who were missing one of the attitude surveys were included, because both of their writing samples were available. Alternate attitude scores were obtained by randomly selecting students for whom attitude scores, but not both writing samples, were available. The same procedure was followed with nine students in project schools. In addition, a few of the "An Influential Person" papers could not be scored for revisions because the student's writing could not be read or because the student had erased the original writing; and, two "Homework Letter" papers could not be scored because first pages were discovered to be missing during the holistic coding session. Consequently, the actual samples used for analyses varied somewhat from the numbers in Table 1.

As can be seen from Table 1, most of the WANDAH projects involved students in the eleventh and twelfth grades. The E High School project, where only eleventh graders were involved in May, 1985 testing, is one exception. The seventh, eighth, and tenth graders in the School G WANDAH project are the other exception.

The H High School sample, which included both eleventh and twelfth graders, was used as a comparison group for each of the eleventh and twelfth grade samples. In the terminology of educational research, a nonequivalent control group design was used for these comparisons. However, no comparison groups were available for the School G seventh, eighth, and tenth graders. As a result, the design there was a pre-experimental pretest-posttest, one-group design.

Dependent Measures

Three types of dependent measures were obtained through student assessments: (1) tallies of student revisions on a piece of writing; (2)

holistic estimates of quality of student writing; and, (3) assessments of attitudes toward writing and toward writing with computers. All of the measures, with the exception of the writing prompt administered in May, 1985, which was administered by an USOE staff member, were administered by the English teachers involved in the WANDAH projects.

Revision scores. A writing prompt entitled, "An Influential Person" was included in the student assessment to obtain an indication of the number and types of revisions which students would make in a piece of writing. (See Appendix E for the posttest prompt and instructions for teachers and students.) Students were to be instructed to write for one half-hour, writing only on one side of the paper and on every other line. After their papers were handed in, students were to be told that they would have 30 minutes during the next class meeting to make revisions in their papers, and to think overnight about the revisions which they might make. The next class period they were to be asked to insert any revisions on the lines left blank or on additional pieces of paper to be stapled to the original composition.

Dr. Charles Duke, Professor and Head of the Department of Secondary Education at Utah State University, developed a revision tally sheet and supervised the scoring of the papers. He began by examining the aspects of revision which are described in the WANDAH system manual and developing a sheet for tallying revisions that included those categories. When Dr. Duke used the sheet to score approximately 30 pretest writing samples (the posttest prompt had not yet been administered), he discovered that some revisions which the students were making could not be coded in the WANDAH categories. If all of the revisions which students made were to be categorized, categories based only on the WANDAH system would be inadequate. He then reviewed scoring categories from the National Assessment of

Educational Progress and found several which seemed to encompass the nonWANDAH revisions he had found. He added those categories to the tally sheet and scored more papers. The revised tally sheet encompassed all of the students' revisions, and was deemed ready for use. (The tally sheet is included in Appendix F.)

Once the posttest papers were available, information that identified student, school, or date of administration was deleted, and an identification number was written on each paper. To ensure "blind" scoring, whether the papers were from pretest or posttest administrations was indicated by a one-digit number included in each identification number. (Dr. Duke reported later that no coders indicated any recognition of the school, grade level, or pre-posttest status of individual papers.) In preparation for coding, the students' papers were then mixed so that they were in no particular order, by school, grade level, or pretest or posttest.

Five people--three composition specialists and two graduate students with areas of emphasis in writing--scored the writing samples for revisions in a six-hour session, with Dr. Duke supervising. As scoring began, the tally sheets seemed satisfactory except for one type of revisions that could not be coded. Consequently, another category was added under, "III. Organizational and Content Changes". It is entitled "Structural Changes". The following revisions were tallied in this category:

Replacement of Information--rewording without altering meaning, usually consisting of the same number of words.

Recognition by Admission--words inserted that seem to have been left out in haste or carelessness, or redundant words deleted.

Paragraph Change--insertion of a symbol to indicate a new paragraph, or that a paragraph break is to be ignored.

Paragraph Order Change--arrows or notes used to indicate the change in placement of paragraphs.

Sentence/Word Order Change/Movement--changes in the order of words or sentences indicated by a line or arrow.

The "Structural Changes" category is included as Category III. D. on the tally sheet in Appendix F.

Holistic scores. The writing sample obtained with the prompt entitled, "Increased Homework" (see Appendix E), administered in May, 1985, had been developed by the Jordan School District and was used by permission. The writing sample from that prompt was intended to be scored holistically. As discussed above, in October, 1985, another writing prompt, "An Influential Person" (see Appendix E), was administered to obtain information on a number of revisions which students would make in their writing. It was decided that to obtain a more reliable estimate of quality of writing, the revised writing samples from the "An Influential Person" prompt would also be scored holistically.

Holistic scores were used as an indication of quality of writing with some reservations. Concerns were expressed at the October 2, 1985 meeting as to the validity of holistic scoring as an indicator of quality of writing that might be affected by the use of WANDAH. The question was also raised as to whether WANDAH programs that began sometime between October and December, 1985 could be expected to have sufficient impact on students' writing by late April, 1986, to affect holistic scores, or, on the other hand, if holistic scoring would be sufficiently sensitive to the changes in writing skills that might be brought about by use of the WANDAH system. In addition, the USOE staff member who, in May of 1985, administered the pretest "Increased Homework" writing prompt to students in large group settings in each school

commented on difficulties that arose during some of the testing sessions, as well as on the apparently low motivation of students near the end of the school year. Then, questions arose during the Spring 1986 posttesting about the students' motivation to do well in responding to the two writing prompts. Some teachers said that students had reacted negatively to being asked to write on the same topic within a nine to twelve-month period. The reluctance to write again on the same topics might have been heightened because the writing prompts were not given as regular classroom assignments, so the motivation of grades, or even of knowing that the teacher would be reviewing the assignments for quality, was missing. Finally, the posttests were administered toward the end of the school year, when students are finishing up schoolwork, taking standardized tests, and generally anticipating summer vacation. That state of affairs could have detracted further from motivation to perform as well as possible on what might have been perceived as additional, extraneous tasks. Clearly, the revision as well as holistic data obtained from the writing samples must be interpreted cautiously.

The guides for the holistic scoring of the two writing samples were also developed by Dr. Charles Duke, and he supervised the holistic scoring. It was agreed that the papers would be coded at six levels, as is common in holistic scoring. Dr. Duke examined the two writing prompts and then developed preliminary versions of the scoring guides. He then read approximately 50 papers for each prompt, including both pre- and posttest samples written by seventh through twelfth graders, checking his scoring categories. He then revised the guides and reread approximately 30 papers for each prompt.

Dr. Duke next drew representative papers for each of the six coding levels and put together packets containing at least six writing samples for

each prompt. The two persons who had agreed to be table leaders for the scoring (Dr. Joyce Kinkead, Director of the Freshman Composition Program at Utah State University, and Dr. Jan Rouse, Director of the Writing Center at USU, both faculty in USU's English Department) met with Dr. Duke to review the scoring guides and to try them out on the sample papers in the packets. Agreement was reached on the "range markers" for each of the six coding levels and some minor final revisions were made in the scoring guides. (The final scoring guides are included in Appendix G.)

As was done with the "An Influential Person" writing samples, all identifying information was removed from the students' papers for the "Increased Homework" prompt and an identification number written on each. The papers were mixed so as to be in no particular order by school, grade level, or pre-posttest. All of the papers, seventh through twelfth grade, were coded at once, to ensure a range of scores and so that all would be coded by the same criteria.

The writing samples for the "Homework Letter" were scored first, with Dr. Duke serving as head reader and Dr. Kinkead and Dr. Rouse serving as table leaders. Nine other readers participated, four graduate students in the USU Composition Program and five faculty members in USU's English, Elementary Education, or Secondary Education Departments. The next day, the same head reader and table leaders, with ten readers (six graduate students in the USU Composition Program and four faculty members in the USU Department of English or Secondary Education) met to read the samples for the "An Influential Person" prompt. The procedures for the scoring sessions are included in Appendix G. The first scoring session was six hours in length; the second one was four hours in length, with the shorter time due in part to experience gained during the first session.

Some question might arise as to whether the number of revisions on the "An Influential Person" writing samples influenced readers' judgments about holistic scores. To answer that question, correlations were run between scores on the three revision dependent measures (WANDAH revisions, nonWANDAH revisions, and total number of revisions) and holistic scores on the "An Influential Person" writing samples. For the pretest, the correlations were .27, .17, and .23, and on the posttest .18, .32, and .31, indicating little evidence of influence. In fact, the correlations between the three revisions scores and the holistic scores for the "Increased Homework" writing samples were similar--.21, .10, and .16 for the pretest, and .17, .26, and .25 for the posttest. The similarity in coefficients suggests that there is a low relationship between ability to make revisions and holistic scores, and that the number of revisions visible on the "An Influential Person" papers did not influence the readers.

Attitudes. An important objective of writing instruction generally, as well as with computers, is to improve students' attitudes toward writing. In order to assess that important variable, a 26-item Opinion About Writing Survey, developed by John A. Daly and Michael D. Miller*, was administered to the students in October of 1985 and late April or early May of 1986. The items in the Opinion About Writing Survey were developed to assess students' attitudes toward writing generally, not toward writing with a computer. The statewide evaluator developed nine items to be added to the Opinion of Writing Survey for the April, 1986 administration to assess students' attitudes toward writing with computers. The items were reviewed by the USOE

*John A. Daly and Michael D. Miller, The empirical development of an instrument to measure writing apprehension. Research in the Teaching of English, 1975, 9, pp. 242-249.

Language Arts Specialist for validity before being added to the Opinion Survey. (The April, 1986 form of the Opinion Survey is included in Appendix F.)

Agreement and Reliability

All of the dependent measures are described more fully in Appendix H. For ease of reporting, acronymns for the dependent measures introduced in that appendix will be used in this section and in discussing the analyses and results.

Revision scores. A sample of 167 compositions (approximately 20%) was randomly selected from the writing samples for the "An Influential Person" prompt to be scored for revisions by two readers. During the regular revision scoring session, these papers were included in the readers' stacks of papers to be tallied, without the readers' knowledge that they were being double-scored. Correlations between the readers' tallies were .70 for TOTWD (total WANDAH) revisions, .84 for TOTNWD (total nonWANDAH) revisions, and .94 for RVTOT (total revisions: WANDAH and nonWANDAH revisions combined). Clearly, the readers were able to tally revisions with a high degree of agreement. On some of the subcategories, however, the correlations were considerably lower, with the range from .53 to .85. The low correlations were for categories in which frequently no revisions could be tallied, thereby reducing variability and the size of the correlation coefficients which could be obtained. Alpha coefficients for the RVTOT scores (TOTWD and TOTNWD scores combined) were .50 for the pretest and .57 for the posttest. These coefficients—which reflect lack of variability in students' scores, not lack of rater agreement—are barely acceptable for group comparisons of the kind carried out.

Holistic scores. For the holistic coding, each paper was read by two people. Each reader gave the paper a score of 1 to 6, and the two scores were summed to obtain a total score for the paper. When the two scores for a paper were more than one level apart, the papers were read by a head reader who resolved the difference. For the "Homework Letter", 6.3% of the papers were given third readings; for the "An Influential Person" papers, 5.7% were given third readings. Both of these figures are well below the 20% of third readings often considered normal in holistic coding.

The correlation between the holistic scores for the two prompts was computed and then corrected with the Spearman-Brown formula to get an indication of the reliability of the HOLTOT (total holistic) scores. For the pretest scores, the correlation was .56; .72, corrected with the Spearman-Brown formula. A coefficient alpha computed on the HOLTOT pretest scores was also .72. The correlation between the posttest holistic scores was .63; corrected with the Spearman-Brown formula, it was .78, which was also the value of the coefficient alpha for the posttest HOLTOT scores. As is common in holistic assessments, a direct reliability estimate was not available for the separate holistic scores for the HOLLT ("Homework Letter") and HOLIN ("Influential Person") writing samples. However, the reliability coefficients of .72 and .78 for the HOLTOT scores were quite satisfactory.

Attitude scores. Daly and Miller reported a split-half, corrected, reliability coefficient of .94 for the Opinions About Writing Survey (SURTOT), with a sample of 164 undergraduate students. The alpha coefficients obtained as estimates of reliability for the scores for the students in this evaluation were comparable--.95 for both the pretest and the posttest. An alpha coefficient was also computed for the nine items that assess attitudes toward writing with computers (COMPTOT), resulting in a

coefficient of .88. Reliability of the scores on the two attitude measures was excellent. Scores on the two attitude scales were unexpectedly independent. The correlation between the two on the posttest was only .13.

Data Analysis

The most commonly accepted statistical analysis for the nonequivalent control group design is to compare the posttest means of treatment and comparison group students, first adjusting those means for any differences on the pretest, using analysis of covariance. Analysis of covariance was used to compare the eleventh and twelfth grade students in each WANDAH project against the H High School comparison group students at those grade levels. In the absence of pretest scores (as was the case with the COMPTOT measure and with the SURTOT scores for B High School), the use of analysis of variance to compare the posttest means is appropriate, and was used. Analyses were carried out separately for grade levels because an initial analysis indicated some treatment by grade level interactions. That is, the treatment results were not always the same for eleventh and twelfth graders, and to pool them for analysis might obscure noteworthy differences.

Most samples had balanced numbers of males and females, and two-way analyses of covariance were conducted with school (that is, WANDAH project versus nonWANDAH project students) and gender as the two independent variables. In the case of the A High School eleventh and twelfth-graders and the G High School twelfth-graders, balanced numbers of males and females were not available, so one-way analyses of covariance were carried out. (There were seven statistically significant interactions between gender and school, but in only two instances were the "treatment effects" markedly different for males and females at the project and comparison schools.)

Statistical adjustments through analysis of covariance are not as satisfactory as random assignment of students to treatments. It cannot be assumed that statistical adjustments for initial differences on a pretest will make the groups equivalent--even on the pretest, unless the pretest-posttest correlation is perfect. Differences between students and school settings are not, then, totally controlled by this design and analysis, and caution must be exercised not to overinterpret the results.

A particular difficulty was presented in this study by the large number of very low correlations between pretest and posttest scores (see Appendices I and J), especially with the revision dependent measures. For those measures, attenuation of scores due to low reliabilities undoubtedly reduced the correlations. Skewed distributions, as indicated by standard deviations larger than means (see Appendix I), may also have been a factor in the low correlations. The only measures for which there were consistent pretest-posttest correlations of .60 and above, often considered the minimum for adequate covariance adjustments of means, were the holistic total (HOLTOT) and the general attitude toward writing (SURTOT) scores. In any event, with low correlation coefficients, no adjustment of posttest means takes place and the analysis of covariance becomes in essence an analysis of variance--a comparison of posttest status that does not take into account pretest status. This point will be illustrated following a discussion of statistical significance and an alternative to it used in this study.

In the absence of any contraindication, the traditional .05 probability was used as the criterion for statistically significant results for all analyses. However, the statistical significance which is directly addressed with analysis of variance, analysis of covariance, and correlated t-tests to compare pre- and posttest means is a function of sample size. That is, the

larger the sample, the more likely it is that a particular difference between means will be statistically significant. Statistical significance is, therefore, not a reliable indicator of educational or practical significance.

A measure of the extent of the difference between groups which is not dependent upon sample size is referred to as an "effect size". One such measure is produced by squaring the point-biserial correlation coefficient that describes the relationship between group membership (in this case, project vs. comparison group) and scores on a dependent measure. The squared coefficient (r^2_{pb}) indicates the proportion of the variance on the dependent measure which is associated with group membership—in this case, with being in a WANDAH project group or the H High School comparison group. An r^2_{pb} was computed for each pair of posttest means compared in an analysis of covariance or analysis of variance. Each r^2_{pb} computed from an analysis of covariance (all but those from the analyses of variance for COMPTOT and the B High School SURTOT scores) is actually an indication of the proportion of variance associated with group membership after the variance which can be attributed to group differences on the pretest has been controlled. Note, however, that if there is a difference between the pretest means and the correlation between pretest and posttest scores is low, so that there is little or no adjustment of posttest means, the r^2_{pb} may simply reflect initial differences between the groups rather than any treatment (or some other) effect.

For the School G seventh, eighth, and tenth graders for which no comparison groups were available, data were analyzed by comparing pre- and post scores to obtain an indication of how much change occurred from the pretest to the posttest. It also seemed of interest, along with the analyses of covariance and analyses of variance, to determine what pretest-posttest

changes had taken place in the various eleventh and twelfth grade groups. That is, the analysis of adjusted or posttest means gives an indication of the relative status of the groups at the time of the posttest; it does not indicate whether the groups' scores increased or declined, or the extent of any increase or decline. Pre-post comparisons of means are reported to provide that dimension to the analysis. Pre-post comparisons are especially important in instances where, due to low pretest-posttest correlations (as discussed above), there was little or no adjustment to posttest means despite evident pretest mean differences. That point is illustrated next.

An example of the ineffectiveness of covariance adjustments occurred with the comparisons of the TOTWD means for the B and C School twelfth graders with the mean for the H High School twelfth graders. The covariance analyses (Appendix J, Table 12) yielded similar r^2_{pb}'s (.23 and .22, respectively). Yet, the B High School group had a pretest mean of 3.00 and a posttest mean of 3.36, for a mean gain of only .36; while the C High School group had a pretest mean of .93 and a posttest mean of 3.18, for a mean gain of 2.26. The School H comparison twelfth graders had a 1.70 pretest mean and a .91 posttest mean, for a .79 decline. With low correlations between pre- and posttest scores (r=.16 for the B School analysis and .20 for the School C analysis), the analysis of covariance resulted in little adjustment of posttest means. The adjusted posttest means were 3.32 and .8 for the B and C School groups, respectively, as compared to .97 and .87 for the H School group for the B and C School analyses, respectively. In contrast, comparing the difference in mean gain scores for the two project schools (+.36 for B High School and +2.26 for C High School) and the comparison school (-.79) yielded a difference in gain of +1.14 for the School B group and +3.05 for the School C group (see Table 4 in Appendix I). Both groups still showed

positive gains relative to the comparison group, but clearly the C group gained more. Also, although both differences between project and comparison school means were statistically significant with analysis of covariance, only the School C result was statistically significant when each group's mean gain was compared with that of the comparison group using the t-test.

As a result of the above type of concern, in addition to the analysis of covariance, the gains of all project eleventh and twelfth-grade groups were tested for statistical significance against those of the H High School comparison groups, using the t-test. Again, squared point-biserial correlation coefficients were computed as a measure of effect size. In this case, r^2_{pb} indicates the proportion of the variance in gain scores that is associated with group membership (i.e., being in a project or the comparison group). For the School B and School C situation described above, where the r^2_{pb}'s from the analyses of covariance were almost identical (.23 and .22), the r^2_{pb}'s for the gain scores were +.06 and +.33 for the School B and the School C twelfth graders, respectively.

Information to Projects

As agreed upon at the October 2, 1985 meeting of project directors and third-party evaluators, scores on the dependent measures for the 25% sample of students for each WANDAH project were sent to the third-party evaluator for each project. In addition, computer printouts of analyses conducted for each project, comparing project students' means with the H High School comparison students' means, where appropriate, and comparing pre-posttest means, were sent to each project's third-party evaluator. A copy of the general cover letter sent to the third-party evaluators, along with a list of the analyses sent to each, is included in Appendix K.

Results

The analyses of student assessments did not in general produce findings that contradicted the positive results of the site visits to the seven WANDAH projects. And, the findings at the twelfth-grade level were particularly consistent with the site visit results. Pretest-posttest changes and then comparisons of the posttest means and mean gains are discussed below. The results of analyses of pretest-posttest changes, including the comparison of project and comparison group mean gains, are presented in Tables 4 through 11 in Appendix I. Those findings are summarized in Table 2. The results of analyses of adjusted posttest means, and of unadjusted posttest means where pretests were not available, are presented in Tables 12 through 19 in Appendix J. Those findings are summarized in Table 3.

Pre-post changes. No clear pattern of results is discernible from the summary of total numbers of pretest-posttest changes presented in Table 2. There were about as many declines as increases in project school mean scores from the pretesting to the posttesting; overall, there were 54 increases and 56 declines (49% and 51%, respectively). However, there were some differences by grade level. At the eleventh-grade level, there were 19 increases and 29 declines (39% and 60%, respectively). The results were similar for the School G tenth graders. For the project twelfth graders, the situation was reversed, with 24 increases and 17 declines (58% and 41%, respectively). And, the changes for the School G seventh and eighth graders were similar to those for the twelfth graders--9 increases and 5 decreases (64% and 36%, respectively). At the same time, the eleventh-grade H comparison group had 5 declines to 2 increases; the twelfth-grade comparison group had 6 declines to only 1 increase. Given the number of declines from pretesting to posttesting, some of the analyses of differences between

Summary of pretest-posttest changes.

School	Dependent Measure							Total +/-
	TOTWD	TOTNWD	RVTOT	HOLLT	HOLIN	HOLTOT	SURTOT	
11th grade								
A	-.17	-1.17	-1.33	-.08	-.83	-.92	+9.75	1/6
B	+.47	+1.12	+1.59	-.17	.00	-.17	____[a]	3/3[b]
C	+.16	-.28	-.12	-2.58*	-1.15*	-3.73*	+.34	2/5
D	-.25	-.29	-.54	+.54	+.29	+.83	+5.17	4/3
E	+.09	+1.96	+2.04	-.71	+.21	-.50	+.25	5/2
F	+.57	-.09	+.47	-.83	-.13	-.86	+3.17	3/4
G	+1.61	-2.25	-2.44	-1.50*	-.75	-2.25*	-1.00	1/6
H	+.13	-1.02	-.90	-.37	-.52	-.90	+3.57	2/5
Total +/- Project Schools	5/2	2/5	3/4	1/6	2/5[b]	1/6	5/1	19/29 40%/60%
12th grade								
A	+.07	+.21	+1.29	-1.07	+.33	-.73	+6.37	5/2
B	+.36	+.07	+.43	+.57	-.29	+.29	____[a]	5/1
C	+2.26*	+3.26*	+5.52*	-2.00*	-1.10*	-3.10*	+3.41	4/3
D	-.47	+.33	-.13	+.87*	+.67	+1.53*	-3.20	4/3
F	-1.70*	-2.85*	-4.55*	-.80*	-1.60*	-2.40*	+5.95*	1/6
G	-.19	+2.80	+4.40	-1.17	+2.33*	+1.17	+8.83	5/2
H	-.79	-2.09*	-2.88*	-.68	-.71	-1.38*	+1.19	1/6
Total +/- Project Schools	3/3	5/1	4/2	2/4	3/3	3/3	4/1	24/17 58%/41%
School G								
7th grade	+1.61	-.38	+1.23	+.79	+.07	+.85	-.43	5/2
8th grade	-.19	-2.75*	-2.94	+.94*	+.19	+1.12	+.06	4/3
10th grade	-.60	+.60	.00	-.67	-1.53*	-2.20*	+.20	2/4[b]
Total +/-	1/2	1/2	1/2[b]	2/1	2/1	2/1	2/1	11/10 52%/48%
Total +/- All Project Schools	9/7	8/8	8/8	5/11	7/9	6/10	11/3	54/56 49%/51%
School I								
11th grade				+.84				
School J								
11th grade				.00				
12th grade				.00				

Note. Students in Schools H, I, and J are comparison groups.

[a]Pretests did not reach the statewide evaluator, so pretest-posttest difference is not available.
[b]No change (0) included with negative change.
*Statistically significant at the .05 level.

adjusted posttest means and between mean gains for the project groups and the comparison group really speak to the question of which group declined less, rather than which group increased more.

The one measure for which there are consistently more positive than negative pre-post changes for project groups across grade levels is the general measure of attitudes toward writing (SURTOT). (Note that the attitudes toward writing with computers measure [COMPTOT] is not included in Table 2 because it was not administered as a pretest.) If attitudes toward writing have the pervasive effect that is often assumed, that finding in and of itself may have some import.

The School G seventh, eighth, and tenth-grade groups are not included in the report of posttest analyses which follows, because there was no comparison group for any of them and, therefore, no differences in adjusted means or mean gains to be analyzed. However, readers interested in the use of computers for writing instruction at the middle school level will want to examine Tables 4 through 10 in Appendix I where the School G seventh and eighth grade pretest and posttest means and standard deviations are reported, along with those of the high school students, for all of the dependent measures. Interestingly, there is no discernible difference in the patterns of seventh and eighth grade and high school means for the three sets of revision scores (TOTWD, TOTNWD, and RVTOT). There are also few differences on the two attitude scales (SURTOT and COMPTOT). There is, however, a tendency for the seventh and eighth graders to have somewhat lower mean scores on the three holistic dependent measures (HOLLT, HOLIN, and HOLTOT). Those lower means suggest that the holistic scores reflect differences in writing ability maturity, providing some support for their validity.

Posttest and mean gain comparisons. The comparisons of project and comparison group posttest means and mean gains are summarized in Table 3, with a squared point-biserial coefficient representing the magnitude of each difference (i.e., the proportion of variance on the dependent measure that is associated with being in the project or comparison group). The direction of the result for each comparison is indicated*, along with whether the difference is statistically significant. And, the direction and magnitude of differences are summarized by dependent measure (columns) and project school (rows).

In summarizing the r^2_{pb}'s initially, plus and minus signs were used to indicate whether the project or control group had the higher mean. That did not seem to represent the data well. For example, r^2_{pb}'s of -.01 and +.01 do not represent two different categories of outcome; rather, both indicate that treatment or comparison group membership was accounting for little or none of the variance in scores on the dependent measure. Consequently, it was decided that any comparison which accounted for less than 5% of the variance on the dependent measure would be considered trivial, and r^2_{pb}'s were summarized in three categories: (1) "+", indicating that the r^2_{pb} was .05 or larger, and the project group had the higher adjusted mean; (2) "0", indicating that r^2_{pb} was .04 or smaller; and, (3) "-", indicating that the r^2_{pb} was .05 or larger, and the comparison group had the higher adjusted mean.

The overall results of the analyses of the eleventh and twelfth-grade data (summarized in Table 3) indicate reason for cautious optimism in regard

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*To indicate direction, r^2_{pb}'s are reported in Table 3 with negative signs, even though squared numbers must be positive. The negative sign is included only to indicate that the comparison group had the higher mean in the mean difference represented by the r^2_{pb}.

Table 3

Summary of r^2_{pb}'s for the posttest and mean gain comparisons.

School		TOTWO	TOTNWO	RVTOT	HOLLY	HOLIN	HOLTOT	SURTOT	COMPTOT	+/0/-[a]	
11th grade		r^2_1 r^2_2	r^2_1 r^2_2	r^2_1 r^2_2	r^2_1 r^2_2	r^2_1 r^2_2	r^2_1 r^2_2	r^2_1 r^2_2	r^{2b}_1	r^2_1	r^2_2
A		-.02/-.00	-.04/-.01	-.05/-.00	-.00/.00	-.01/-.00	-.00/-.00	.01/.03	.18*	1/6/1	0/7/0
B		.01/.01	.10*/.07	.06*/.05	.00/.00	.02/.01	.01/.01	-.05/__[b]	.18*	1/4/1	2/4/0
C		-.06/.00	-.04/.01	-.06/.00	-.09*/-.17*	-.04/-.02	-.13*/-.10*	-.04/-.01	.00	0/4/4	0/5/2
D		-.01/-.01	-.00/.01	-.01/.00	.05/.01	.04/.01	.09*/.04*	.01/.00	.00	2/5/0	0/7/0
E		.07*/-.00	.12*/.13*	.11*/.07	.01/.00	.05/.02	.02/.00	.01/-.01	.21*	5/3/0	2/5/0
F		-.00/.01	-.00/.01	-.00/.01	-.00/-.01	-.00/.01	.00/.00	.00/-.00	-.01	0/3/0	0/7/0
G		-.02/-.01	-.00/-.02	-.00/-.02	-.07/-.05	-.01/-.00	-.06/-.02	-.07/-.01	-.00	0/3/3	0/5/1
+/0/-[a]	r^2_1	1/5/1	2/5/0	2/3/2	1/4/2	1/6/0	1/4/2	0/5/2	1/4/0	11/36/9	4/41/3
	r^2_2	0/7/0	2/5/0	2/5/0	0/5/2	0/7/0	0/5/1	0/5/0		20%/54%/16%	9%/85%/5%
12th grade											
A		-.00/.04	.05/.15*	.02/.44*	-.01/-.01	.12*/.05	.02/.01	.01/.02	.12*	3/5/0	3/4/0
B		.23*/.06	.28*/.07	.31*/.09	.11*/.06*	.15*/.00	.11*/.04	.06/__[b]	.24*	9/0/0	4/2/0
C		.22*/.13	.29*/.32*	.36*/.38*	-.10*/-.07*	-.00/-.01	-.09*/-.04*	.05/.00	.10*	5/1/2	3/3/1
D		-.01/.01	.03/.09*	.01/.06	.11*/.09*	.07/.08*	.15*/.11*	.01/-.01	-.00	3/5/0	5/2/0
F		-.10*/-.04	-.11/-.01	-.15*/-.02	-.01/-.00	-.06/-.04	-.06/.01	.08*/.02	.06	2/1/5	0/7/0
G		.04/.23	.08/.28*	.07/.31*	-.02/-.04	.14*/.30*	.08/.09*	.10*/.04	-.10*	5/2/1	5/2/0
+/0/-[a]	r^2_1	2/3/1	4/1/1	3/2/1	2/3/1	4/1/1	3/1/2	4/2/0	4/1/1	26/14/8	20/20/1
	r^2_1	3/3/0	5/1/0	5/1/0	2/3/1	3/3/0	2/4/0	0/5/0		54%/29%/17%	49%/49%/2%
11th + 12th grades	r^2_1	3/8/2	6/6/1	5/5/3	3/7/3	5/7/1	4/5/4	4/7/2	7/5/1	37/50/17	24/61/4
	r^2_2	3/10/0	7/6/0	7/6/0	2/8/3	3/10/0	2/10/1	0/11/0		36%/49%/15%	27%/68%/4%

B vs:	Grade	r^2_1	r^2_2
I	11	-.01	-.21
J	11	-.00	-.04
	12	.06	.12
		1/2/0	1/1/1

Note. In the pairs of columns, r^2_1, is the squared point-biserial correlation coefficient from the comparisons of adjusted or unadjusted posttest means; r^2_2 is the squared point-biserial coefficient from the comparisons of mean gains. For the r^2_{pb}'s, the direction of the difference between the two means is indicated by a plus or minus, even if rounded to two decimal places the r^2 is zero. If no plus or minus is present, the two means were exactly equal.

[a]The numbers and percentages of plus, zero, and minus differences for the respective column or row. If an r^2_{pb} is not large enough to account for at least five percent of the variance in scores on the dependent measure (i.e., is less than .05), it is regarded as trivial and the difference is classified in the "0" category.

[b]Pretest not available, so mean gains could not be compared.

*Difference between means and the r_{pb} are statistically significant at the .05 level.

to WANDAH project outcomes. For the comparisons of both posttest means and mean gains, there are more positive than negative outcomes. For the former, there are 37 comparisons (36%) in which the project group had the higher posttest mean and only 17 (16%) in which the comparison group did; for the latter, in 24 instances (27%) the project group had the higher mean gain, with only 4 instances (4%) in which the comparison group did.

As with the pretest-posttest changes (summarized in Table 2), the performance of the twelfth-grade project groups exceeded that of the eleventh-grade groups. For the twelfth graders, in 54% of the posttest comparisons (N=26) the project group mean was higher, to only 17% (N=8) for the comparison group; and, the project group mean gain was higher in 49% (N=20) of the comparisons, with the comparison group having the higher mean gain in only 2% (N=1) of the comparisons. In contrast, the eleventh grade project and comparison groups were nearly even in the number of higher posttest means (11 and 9, 20% and 16%, respectively) and in the number of greater mean gains (4 and 3, 8% and 6%, respectively). As a consequence, there were also a greater percentage of instances in which differences between posttest means or mean gains were zero or trivial for the eleventh graders (64% and 85%, respectively) than for twelfth graders (29% and 49%, respectively).

It is worth noting that, generally, the larger r^2_{pb}'s are for differences in which the project group, rather than the comparison group, had the higher adjusted mean or mean gain. It is conventional to consider an r^2 of .10 or larger (i.e., an r^2_{pb} indicating that 10% of the variance in scores is associated with group membership) as indicating substantial differences between groups. Ten such r^2_{pb}'s are present at the eleventh grade level, and seven are for comparisons in which the project group had the higher mean. At

the twelfth grade level [illegible] 52 [illegible]'s greater than .10; 27 of these are for differences in which the project group had the higher adjusted mean or mean gain.

Other pieces of information are worth noting in Table 3. For example, the project schools, [illegible]cally, showed little advantage on TOTWD--the measure of WANDAH-related revisions. At the same time, the overall performance of the project groups is better than the comparison group's performance on TOTNWD (the nonWANDAH-related revisions) and, consequently, on RVTOT (total revisions). There is also a tendency for twelfth-grade project groups to have higher mean scores than the twelfth-grade comparison group on one of the holistic measures (HOLIN) and, consequently, on HOLTOT (the sum of the two holistic scores). Because of the twelfth graders' performances, the summary for the comparisons of adjusted posttest means on the SURTOT attitude scale (the analysis of covariance is the preferred analysis here because of the high pretest-posttest correlations) favor the project group. Also, the project groups have a striking number of higher posttest means on the writing-with-computers (COMPTOT) attitude scale.

Summary and Conclusions

Overall, despite the relatively moderate number and size of pre-posttest gains, the comparisons of the posttests and mean gains of project groups with those of comparison groups indicate positive WANDAH project effects on students, especially at the twelfth grade level. However, it must be kept in mind that in some instances, the differences indicate less decline, rather than greater gains, as compared to the comparison group.

Some other caveats are in order. For instance, all project groups were compared against the same comparison group at each grade level, rather than

having an equivalent comparison group at each site. It is difficult to know to what extent the results reflect specific unknown conditions at the comparison school and the particular samples from that school. Drawing conclusions about the relative effectiveness of the different WANDAH projects would be particularly problematic.

Testing presents another difficulty in drawing conclusions. For example, except for the initial writing prompt and the limited School I and J writing samples, all of the tests were administered by project teachers, introducing potential variability in the way the testing and the tests were presented to students. The effects of possible differences in test administration take on particular importance in light of the end-of-the-school-year testing difficulties noted in the Dependent Measures section.

It is difficult to know how variability in testing, along with the use of only one comparison school, might have affected the varying results, aside from possible variability in WANDAH-related curricula and instruction at the various project schools. The site visits yielded no reason to expect less WANDAH instruction impact at the eleventh grade level. How much stock to put in the results of any one study is always open to question. Might the perplexing eleventh-twelfth grade differences on student assessments merit further attention? For example, could they be due to differences in the curriculum at the two grade levels? No evidence is readily available. Or, are they due to maturational differences in eleventh and twelfth graders? The latter possibility does not seem likely in light of the performance of the seventh and eighth graders on the assessments. Or, are they simply an artifact of the greater losses by the twelfth-grade, as compared to the eleventh-grade, comparison group? In particular, there were substantially greater losses by the twelfth-grade comparison group on the TOTWD and TOTNWD

and, consequently, RVTOT dependent measures; and there were somewhat greater losses by the comparison group on the holistic measures. Nevertheless, that the positive gains for the project schools are not only more numerous but of greater magnitude than those for the comparison groups suggests some effects from the WANDAH projects.

Caution is called for, then, in interpreting the results, which are positive in large part because of the performance of the twelfth-grade project students. Nevertheless, it is important to emphasize that these results do not contradict the generally positive results from the site visits to the WANDAH projects.

CONCLUSIONS

Seven questions which guided the evaluation of the WANDAH productivity projects at the statewide level were stated in the Introduction to this report. Those seven questions provide a framework within which to draw conclusions based on the user information gathered during site visits to the seven project schools and on the analyses of the quantitative data gathered during pretesting and posttesting in the seven project schools and the one comparison school.

(1) Did the quality of writing of students using the WANDAH system show improvement beyond that which would be expected in traditional writing programs? The answer to this fundamental question is a somewhat qualified, yes. Students, teachers, and principals made it clear during site visit interviews that the quantity of writing had increased dramatically as a result of the WANDAH projects. Teachers were assigning more writing and students were writing longer papers. It is a widely accepted assumption in writing instruction that if students will write more, the quality of their writing will also improve.

Most of the students who were interviewed thought that their writing had improved when they were writing on the computer, and some thought that it had improved when doing noncomputer assignments. The teachers concurred. That is, there was high agreement that student papers written on the computer were not only neater, but better organized and better revised. And a number of teachers commented that they thought their students were beginning to gain a sense of quality writing. It was particularly relevant that several teachers commented on the unexpected creativity of students, particularly less academically-inclined students, when writing on the computer. However, the teachers also agreed that writing skills and creativity demonstrated on the computer did not always transfer to noncomputer English writing assignments or, perhaps even less so, to nonEnglish writing assignments. Results from analyses of the pretest-posttest quantitative data indicated that while there were few clear-cut effects, there was a tendency for twelfth-grade project students to make more revisions and obtain better holistic scores on their writing than did comparison students.

In light of the relatively short period of instruction with the WANDAH system (less than a school year) and the difficulties with testing mentioned in prior sections, the somewhat mixed results for the quantitative data are not particularly surprising. It is clear from the site visits that the quantity of student writing has been increased by the WANDAH projects. The evidence from interviews during the site visits, with slight substantiation by the quantitative results, provide support for the conclusion that the WANDAH projects have had a significant, if somewhat limited, effect on quality of writing.

(2) Did use of the WANDAH system have an effect on students' attitudes toward writing? During site visit interviews, students consistently commented that they liked to write much better on the computer—even, in some instances, students who said they had very much disliked writing before. Teachers were equally enthusiastic about student attitudes toward writing on the computer, frequently noting how eager students were to write and revise. Although some teachers and students thought that positive attitudes toward writing carried over to noncomputer writing, there was not agreement on that point. The results from the quantitative data were not very clear on this question, particularly at the eleventh grade level.

It is interesting that in the project which is in its second year of operation, students and teachers still maintain their enthusiasm for writing with computers, although now with the newness somewhat worn off the computers are seen more basically as a tool for writing rather than a technological novelty. And, it is relevant that a common problem noted by teachers and students in every school was the inadequate number of computers available for writing. Overall, there is a basis from the site-visit interviews, with some support from the analysis of data from the attitude scales, to conclude that writing instruction using the WANDAH system has had a positive impact for most, but not all students, on attitudes toward writing, particularly when that writing can be done with a computer.

(3) Did the WANDAH productivity writing project have an effect on the school districts' writing programs and on the staff? Clearly, teachers who had not previously been using process writing as a basis for their writing instruction were assisted in doing so by participation in a WANDAH project. The introductory workshop provided by the Logan WANDAH project director and writing lab aide was helpful in that regard, as well as in learning about

computer use. It should be noted, however, that several teachers commented that the effects of the WANDAH projects are difficult to differentiate from shifts to process writing which have been occurring as a result of the State Core Curriculum; program changes might have occurred without the WANDAH projects, although accelerated by them. For teachers who were already teaching process writing, the WANDAH system was very complementary. Overall, then, the WANDAH productivity projects appear to have either moved teachers more in the direction of process writing instruction or aided those who were already doing so.

One consequence of the movement toward the teaching of process writing, consistent with the State Core Curriculum, has been a decreased emphasis on formal instruction in grammar and usage. Most teachers are comfortable with this program change. They are able to teach grammar and usage as individual writing problems occur; and they believe that because students see applications to their own writing, increased learning of grammar and usage is occurring. Some teachers wonder, however, if some formal instruction may not be necessary to provide students with prerequisite concepts for the individualized instruction. Some are concerned, too, about the effects on student performance on standardized tests. And, some do not feel effective in teaching grammar and usage as individual student problems arise—an area in which some teachers need assistance.

The effects of the WANDAH writing projects on the teaching of literature are not so clear cut. A few teachers did indicate during interviews that they thought that they were teaching less literature; others thought they were teaching more, because they were integrating writing with the study of literature more effectively.

There was no reason to conclude based on the teachers' comments that teachers believed that the curriculum has become "unbalanced" with an undue emphasis on reading and insufficient attention to grammar and literature as a result of the WANDAH projects. Even those teachers who were somewhat uncomfortable with decreased attention to either formal grammar instruction or literature indicated at the same time that they thought writing instruction is central to the language arts curriculum.

A part of this question has to do with the effect of the WANDAH projects on teaching loads: The answer is fairly clear-cut. A small percentage of teachers indicated that because they were now giving students more writing assignments, they were also spending more time reading papers at home in the evening. All teachers agreed, however, that writing assignments done on the computer were much easier to read, both because of the neatness of the printed copy and because they were revised and edited more thoroughly. Most teachers thought that the ease of reading offset the increased work load. And, some indicated the belief that, in any event, all pieces of student writing do not have to be read, and it is appropriate to read some pieces looking for specific types of writing skills, thus reducing the reading work load in two different ways.

One program effect, with which each project is struggling, is the impact on the curriculum of the necessity of scheduling class time in the writing lab in order to coordinate the use of the lab by multiple English classes during the same period. The scheduling problems are compounded by the fact that in most situations the number of computers in the writing lab allows for only one-half to one-third of the class to be in the lab at any one time. In the one school without a full-time writing lab aide, program difficulties were especially exacerbated. There was general optimism that scheduling

problems would be lessened during the second year of each project, and there was less feeling of being tied to the lab schedule in the one school in which the WANDAH project was in its second year. Of course, a tremendous aid to solving the scheduling problem would be to have more computers available for writing instruction.

The WANDAH projects have had effects on programs and staff. Implementation of the WANDAH writing system has encouraged, and been complementary to, the teaching of process writing; formal teaching of grammar has been de-emphasized and more teachers are integrating literature and writing; teachers are reading more, but better written, papers; and, lab use scheduling is interfering somewhat with the desired flow of the curriculum.

(4) Would there be any cross-curriculum effects from the WANDAH projects, such as increases in the quality of students' writing in nonEnglish courses? Cross-curriculum effects were not a heavy emphasis of the first-year WANDAH projects, nor of the statewide evaluation. Project directors indicated that implementing the WANDAH system in English classes was the primary goal for the first project year. Nevertheless, some nonEnglish teachers were interviewed. There were some reports, although by no means unanimous, that differences in quality of writing were being observed on nonEnglish writing assignments. Cross-curriculum effects were particularly noticeable in the three schools where students were encouraged to write nonEnglish assignments on the computers, in the two schools where there had been explicit attempts to encourage nonEnglish teachers to use the computers and the WANDAH system for writing assignments, and in the one second-year project where nonEnglish teachers were participating in a writing group.

Clearly, cross-curriculum writing is an area of much potential for the WANDAH projects. Although one project director was encouraging cross-

curriculum use of the writing lab to ensure full utilization of the computers, it was more common for the inadequate numbers of computers available for writing and the pressure for their use for language arts instruction to restrict the amount of cross-curriculum writing that was done. The answer to this question is that there appear to have been minimal cross-curriculum effects from the WANDAH projects, but the potential is great.

(5) If any differences in improvement in the quality of student writing could be detected from project to project, would there be factors such as the philosophy of the writing program, the extent to which the use of computer technology was embedded in a sound philosophy of process writing, teacher experience and attitudes, and the conditions of adoption and implementation that were associated with the differences? Clear differences in the improvement of quality of student writing could not be detected from project to project. What might have been differences in quality were too frequently confounded with testing conditions to make warranted conclusions about variability and effectiveness among the projects. It did seem clear from the interviews that, in every instance, the use of computer technology was embedded in a philosophy of process writing. All departments and teachers seemed to accept that philosophy, although there was some variability in their own perceived effectiveness in implementing it. No variabilities were observed in adoption and implementation conditions, or in the variety of physical arrangements for the writing labs, that seemed to be related to quality. The answer to this question is that consistent and credible differences in student writings were not detected from project to project. Nevertheless, the site visits made it clear that technology was not being emphasized for its own sake, and computer use was taking place within the context of a commitment to process writing.

(6) Did the use of the WANDAH system have any effect on student-teacher ratios? If effect on student-teacher ratios is thought of as reductions in the number of students which any one teacher teaches, the answer to this question must be, no. However, teachers and principals consistently commented during site visits that because of the WANDAH project's computer writing lab, including the presence of a professional or a paraprofessional writing lab aide, the students were receiving significantly more writing instruction than they would have received without. That student on-task behavior was notably higher while they were writing on the computer was also noted consistently. So, while teacher-student ratio in the conventional sense did not change, what did change was the instructional ratio. That is, with the same number of students per teacher, students are receiving increased writing instruction.

(7) Did the use of the WANDAH system have any effect on space utilization? Putting computers into a writing lab requires space, rather than reducing space needs. In each school, space that might have otherwise been used was taken up by the writing lab. However, in no school did the principal, the English teachers, or the nonEnglish teachers who were interviewed indicate that some alternative use for the space would have been preferred. Students, too, were nearly unanimous in stating, when asked, that they would not want the writing lab taken from their school.

Summation. To sum up, the overall effects of the WANDAH projects have been positive. The projects received enthusiastic endorsements by most users and there is some quantitative evidence, especially at the twelfth grade level, to support the indicators, from site-visit interviews, of positive WANDAH project effects. It is worth noting, too, that those positive effects appear to be present in the one middle school involved in a WANDAH project.

Overall, the statewide evaluation has produced, particularly from the site visits, strong evidence of the desirability and effectiveness of the use of the WANDAH system in computer writing labs as part of writing instruction programs.

Appendix A

1985-86 WANDAH Productivity Projects
and Schedule of Site Visits

School District and School	Date of Startup	Arrangements	Grade Levels	Student Use	Site Visit Date
Alpine (Pleasant Grove High)	10/85	19 IBM computers & 5 printers. Writing center with work area. Professional aide and student assistants.	10-12	4 weeks on & 4 weeks off. 20 1/2 periods per year. Available 7:15 am to 3:15 pm.	4/10/86
Nebo (Spanish Fork High)	10/21/85	20 A&T computers & 5 printers. In library-media center. Professional aide & student assistants.	11, 12	Alternate days. Available before and after school.	4/11/86
Weber County (Roy High)	10/15/85	20 A&T computers & 5 printers. Double-size classroom with conference tables. Professional aide & student assistants.	11, 12. 10th introduced.	10th: 6 86-minute periods; 11th, 12th: 18 86-minute periods (up to 24 periods). Available before and after school.	4/19/86
Cache County (Mt. Crest High)	11/27/85	20 IBM computers & 5 printers. Writing lab with no work area. Parent volunteers. No aide.	11-12. 10th introduced.	10 days at a time. Available 30 minutes prior to classes in the a.m. and until 5:30 p.m.	4/22/86
Logan (Logan High) Year 2	8/84	20 IBM computers & 5 printers. Writing lab with work area. Professional aide.	9, 10, 11, 12	3 weeks each 12-wk trimester. Available before and after school.	4/24/86
Park City (Park City High)	9/4/85	12 computers. 1/2 of classroom with curtain divider. Professional aide.	10, 11, 12; 9th introduced.	One to two weeks at a time. Available 6:00 a.m. to 5:00 p.m.	4/25/86
North Summit (North Summit Middle and High)	10/29/85	Computers at the high school in lab with no work area. 12 A&T & 3 printers, used for WANDAH 1st 4 periods of the day. Professional aide.	7, 8, 10-12	Depends on class size—from every day to 2 or 3 times a week. Use rotates 2 weeks on and 2 off. Not available before or after school.	5/9/86
Northeastern Utah Educational Services Region (NUES)	1/15/86	Telecommunications to 3 high schools.			Not Visited

Appendix B

Preliminary Reports: Project Guidelines
and Statewide Executive Summary

WANDAH PROJECT

School District
School(s)
Person(s) Who Prepared the Report

Brief Description of Project

This section should describe briefly the particular WANDAH project. Included should be the schools involved, grade levels of students, physical arrangements, and how students will use WANDAH as part of their language arts or other school program.

Implementation

This section should provide information on the date on which the WANDAH program went into operation, any unanticipated problems in putting the program into effect, and the current status of the implementation of the program. Also included in this section, if not covered in the Project Description section, would be such items as the management of the WANDAH system--who is responsible and how is use of WANDAH organized; the adequacy of the physical location; how the system is being received by the teachers; and usage by students--e.g., how much contact each student is able to have each week and whether the system is available for use before and after school.

Students

This section should include any preliminary evidence on students' use of and reaction to the WANDAH system. The evidence may come from observation of students, from interviews, from student logs or writing folders. Items might include whether students are positive toward the WANDAH system, whether it appears that they are spending more time on task, whether they are doing more revising and finding the WANDAH system to be helpful in the revisions.

Teachers

This section should present any information available about teacher use of and receptivity to the WANDAH system. What do teachers report in regard to the ease of integrating WANDAH into their language arts program or into cross-curriculum writing programs? Have teachers encountered any particularly difficulties in having their students use WANDAH, or have there been pleasant surprises in regard to the usability of the system? What are teacher impressions in regard to the relationship of the WANDAH program to the state core curriculum? What are teacher reactions to the usefulness of the training which they received in Logan last summer, now that they are involved in program implementation? Do teachers anticipate using WANDAH differently now than they did prior to project implementation? What changes in scheduling or physical facilities would teachers like or, conversely, what do they find particularly favorable about present scheduling or physical facilities?

Evaluation

This section should describe briefly project participation in the statewide assessments (the May 1985 writing sample and the October 1985 revision and attitude testing), including dates of administration, process of administration, and number of students involved at each grade level, including any control group students. Other evaluation assessments that have been or will be administered should be described briefly, as well as any control group comparisons that are to be made other than those that involve the students who were involved in the May 1985 writing assessment. Special attention should be given to any information that has or will be gathered in regard to productivity in particular--that is, how use of WANDAH will increase quality of writing without increased cost. Attention might be given here to whether use of WANDAH to increase writing quality will result in the slighting of any other instructional objectives, or whether it will actually enhance the achievement of other instructional objectives. (For example, it may well be that the use of WANDAH will enhance the teaching of traditional grammar, rather than detracting from it.) Reference to the standards and objectives to the state core might be particularly appropriate here.

Summary

This section should provide a brief summary of (1) the status of implementation; (2) student, teacher, and other district reactions; (3) particular successes to this point as well as unanticipated problems that have arisen; and, (4) anticipated progress during the remainder of the school year.

EXECUTIVE SUMMARY

PRODUCTIVITY PROJECT: STATEWIDE EVALUATION OF COMPUTERIZED WRITING INSTRUCTION (WANDAH)

Preliminary Report
1/24/86

The WANDAH computer writing system was used successfully in Logan High School during 1984-85. Seven projects were funded to replicate the use of the Logan Project during 1985-86 and all but one have been operational since at least mid-October.

There is variety among the WANDAH projects in terms of physical arrangements, ranging from a special double-size classroom with conference tables, to a curtain-divided classroom, to a section of a library media center. Two labs have 19 or 20 computers and 3 have 12 computers. Students being taught with WANDAH range from the 7th through the 12th grade.

With a mid-October start-up for most projects, due to a delay in the availability of WANDAH software, time in use has been limited. Nevertheless, teachers have reacted enthusiastically at all sites. They report that use of WANDAH has: increased the amount of instruction in writing; supported the study of literature by helping students to think more systematically in their writing assignments; shifted attention from mechanics to the process of writing; resulted in students making more revisions, learning grammar better in the context of their own writing, and doing more cooperative student work; increased the quantity and quality of student writing; and enhanced adoption of the state Core Curriculum.

Students say that the WANDAH program is easy to learn and fun to use, with revisions much easier to make. Slower students are finding that the word usage and spelling checks are particularly helpful, while advanced students are finding that the search capabilities challenge them to develop their

writing skills. The major student concern is how to get more time on the computer.

Preliminary evidence of productivity outcomes includes reports of increased writing instruction, increased quantity and quality of student writing, improved study of literature and greater learning of grammar, students staying on task for longer periods of time, and more assistance to students in writing development, revision, and examination for stylistic features than teachers could provide without WANDAH. Writing is also being extended to other curricular areas.

Problems include the difficulty that the Northeastern Utah Educational Services Region encountered with its telecommunications system for information exchange with remote schools, which was not yet operational for WANDAH as of December 15, lack of adequate work space in some computer labs for students working on off-computer writing tasks, as well as some minor technical difficulties. The basic problem is, in a sense, a positive feature—that is, the lack of an adequate number of computers at each site to provide the on-computer writing time that both students and teachers think desirable. Overall, the reactions of teachers and students are positive at this early stage in the 1965-66 computerized writing instruction (WANDAH) program.

Appendix C

Site Visit and Testing Letters

UTAH STATE UNIVERSITY · LOGAN, UTAH 84322

COLLEGE OF EDUCATION
TELEPHONE (801)750-1469

BUREAU OF
RESEARCH SERVICES
UMC 28

SAMPLE

March 10, 1986

Lucille Taylor
Spanish Fork High School
160 South 100 East
Spanish Fork, UT 84660

Dear Lucille:

You will recall, I trust, from the October 2, 1985 meeting of WANDAH project personnel, that I am to make an on-site visit to each project during April as part of the statewide WANDAH evaluation. During that visit, I would like to observe the writing center in action and visit with you, as well as talk with different persons: students who are using WANDAH and those who are not; English teachers involved in the use of WANDAH; teachers in other curriculum areas and any English teachers who are not involved in the WANDAH project; and, the school principal. The purpose is not to supplant any interviewing or other data-gathering by you and your third-party evaluator, but to get some sense, on a statewide level, of the problems and successes in implementing WANDAH during this first year. If there is anyone else with whom you think I should talk during the on-site visit, please let me know.

As indicated at the October 2 meeting, I will bring with me a graduate student (an experienced secondary school teacher) who will help me with the interviewing.

I will need some assistance from you in setting up the site visit to the Spanish Fork High School. First, I need to verify a date for the visit. I am in hopes that you can accommodate the visit on either Thursday or Friday, April 10 or 11. Less desirable, but possible, would be either Thursday or Friday, April 24 or 25. At the same time, if there are school activities or anything else of that sort that would make a visit unadvisable on the dates I have suggested, please let me know.

We would, of course, like to be as unobtrusive as possible during our visit. I would appreciate it, however, if you could schedule an half an hour for me to meet with your principal. Also, it will be necessary for expectations to be set so that I can have an opportunity to interview the teachers and students, which means being able to have access to them for a few minutes during the day in some nook or corner where we can talk.

If you would call or write as soon as possible to let me know about the acceptability of the site visit dates I have proposed, that would be extremely helpful. Also, if you could let me know at what time your school day starts and ends, and let me know the length of periods during the day, as well as provide me with directions to get to the school, I would be most appreciative.

Thanks in advance for your assistance.

Sincerely,

James P. Shaver
Professor and
Associate Dean
for Research

JPS/km

cc: Norman F. Hyatt

UTAH STATE UNIVERSITY · LOGAN, UTAH 84322

COLLEGE OF EDUCATION
TELEPHONE (801)750-1469

BUREAU OF
RESEARCH SERVICES
UMC 28

MEMORANDUM

TO: School Contact Person and/or Third Party Evaluator, WANDAH Projects

FROM: James P. Shaver

SUBJECT: Testing Material for the week of October 14

DATE: October 7, 1985

At our meeting at the Utah State Office of Education building in Salt Lake City on October 2, it was agreed that those students who participated in the collection of the writing sample by the Utah State Office of Education in May of 1985 would be given two additional assessments during the week of October 14. Both are enclosed. One is a writing exercise that gives the student an opportunity to make revisions; the other is an opinion survey designed to get at student attitudes toward writing.

It is VERY IMPORTANT that all students who participated in the collection of the writing sample last May be included in this round of assessment. That includes both students who will be using WANDAH during the school year and any control students who would be used for comparative purposes. You may wish to administer the writing sample and the survey in regular classes, so students who are not part of that earlier writing sample will take them. This will present no problems, as we will be able to select students by matching their names against the master list which was prepared last May.

As agreed, you will need to make copies of the tests for your students. The writing opinion survey may either be reproduced on two sheets or on the front and back of one sheet. Both formats are included. The front-back copying has the advantage of reducing the amount of paper to be used and transported. However, it is recognized that some schools may not have that copying capacity.

Note that for the writing sample, the student is to write his or her name, school, grade, and the date on the writing sample itself, rather than on the instruction and topic sheets. This will allow you to use the instruction sheets for more than one class, thereby cutting down on copying costs. It will, however, be especially important that the student information be recorded on the first page and that multiple pages of writing by any student be stapled together.

I assume that most projects will use the regular classroom teachers to administer the tests. It will, of course, be important that the testing be

done according to the instructions and in an unbiased manner. It would be excellent if you could arrange a meeting at which your teachers can review the tests and instructions, have any questions answered, and be urged not to make any comments that might bias students. If a meeting is not possible, please try to communicate with individual teachers to enhance uniformity and lack of bias in administration.

I would appreciate it if you would provide me with a brief report on the October testing. For example: (1) On what dates were the revision writing sample and the opinion survey administered? (2) Were there any problems or incidents that might affect interpretation of the results? (3) Were there any problems that might call for revision of the instructions? (4) Any other comments that might be helpful.

I have not enclosed a copy of the writing sample that was administered in May 1985. If you want to administer that writing sample this Fall as a pretest for students who were not included in the Spring 1985 testing, please call me (750-1469) and I will send you a copy immediately.

If you have any questions, please do not hesitate to call. Once the enclosed writing sample and the attitude survey are administered, please see that they are delivered either to George McCulley at the Utah State Office of Education or to me at the Education Building at Utah State University.

JPS

km

Enclosures

cc: George McCulley

MEMORANDUM

TO: &CONTACT& and &EVALUATOR&

FROM: James P. Shaver

SUBJECT: WANDAH testing material for the week April 28 - May 2, 1986

DATE: March 5, 1986

At our meeting at the Utah State Office of Education building in Salt Lake City on October 2, it was agreed that during the week of April 28 through May 2, 1986, there would be posttesting of the students who were included in the collection of the writing sample in May 1985 (and who also were given the revision exercise and the attitude survey in October 1985). The three post-assessments are included, with revisions in each so as to be appropriate as a posttest.

It is very important, as before, that all of the students who participated in the collection of the writing sample last May be included in the posttesting. That includes both students who have been using WANDAH and any control students who were assessed earlier. As before, you may wish to administer the assessments in regular classes, and some students who are not a part of the first writing sample will be included. That will present no particular problem, as we can select students by matching their names against the master list prepared for the earlier testing.

Again, as agreed, you will need to make copies of the tests for your students. The Writing Opinion Survey may be reproduced either on two sheets or on the front and back of one sheet. Both formats are included. The front-back option has the advantage of reducing the amount of paper to be used and mailed. However, if your school does not have that copying capacity, the two-sheet option is acceptable. (Note: the second page is quite full and careful copying will be necessary.)

Note that again, for the Writing and Revision Samples, each student is to write his or her identifying information on the first page of the composition. This will allow you to use the instruction sheets for more than one class, thereby cutting down on copying costs. It will, however, again be especially important that the student information be recorded on the first page, that the student's name be recorded on any additional pages, and that multiple pages of writing for either assignment be stapled together.

Again, I assume that regular classroom teachers will probably administer the tests in most cases. It will be important that the testing be done according to the instructions in an unbiased manner. You will probably want to meet again with your teachers to review the tests and instructions, answer any questions, and urge them not to make any comments that might bias the students' responses. If a meeting is not possible, please try to communicate otherwise with individual teachers to enhance uniformity and lack of bias in assessment administration.

It has taken a great amount of time for a clerical assistant to put the previously administered tests in order. I would appreciate it if for this testing the tests for each classroom could be arranged in alphabetical order before being returned to me. That would greatly facilitate our handling of the tests, which is important because there will not be much time to score tests and get results for your students back to you.

It is important that the three assessments be administered in the following order: (1) The Opinions About Writing Survey; (2) Composition Activity (A): Increased Homework; (3) Composition Activity (B): An Influential Person. Please be certain that this order is followed.

As agreed, I will do everything possible to get back to you by June 1 the scores for the sample of your students selected for analysis so that you can include them in your data analysis. Because scoring the writing samples will be very time-consuming, there will be a real press of time in meeting that deadline. Consequently, please mail the tests, or send them via UPS, directly to me at Utah State University, rather then sending any to George McCulley at the State School Office. If you send by UPS, it will be important to have the new name for the College of Education building in the address--i.e., the Ray B. West (Education) Building--so that the delivery person can find it.

Please send the tests promptly so that I can receive them by May 12 at the latest. To reduce mailing costs, you may want to sort out the tests for students who were not part of the original May 1985 writing assessment.

I would also appreciate once more a brief report on your testing. It would be helpful to know (1) on what dates the three assessments were adminstered, and (2) whether there were any problems or incidents that might affect interpretation of the results. Any other comments that you think might be helpful will be appreciated.

If you have any questions, please do not hesitate to call.

JPS

km

Enclosures

cc: George McCulley

Appendix D

Site Visit Interview Guidelines

SITE VISIT INTERVIEWS

INTRODUCTION

Principals

[Introduce self as either a faculty member at Utah State University or as a doctoral student working with Dr. Shaver.] I am [We are] conducting a statewide evaluation of seven WANDAH (HBJ WRITER) projects funded this school year by the Utah State Office of Education. The purpose is to find out about the differing conditions under which WANDAH use has been implemented and to gain impressions of how the program is viewed by people in the schools. In particular, your schoolwide perspective as the principal of the school is valuable.

WANDAH Project Director

. . . . In particular, your perspective as one who has played a major role in implementing the use of WANDAH in your school is especially valuable.

WANDAH Teachers

. . . . In particular, I would like to have your reactions to your involvement in the use of WANDAH--how it has worked out for you personally, as well as for your students.

Non-English Teachers

. . . . In particular, I would like to know what teachers in other curriculum areas think about WANDAH and whether it has had any noticeable effects on the writing that students do for your classes.

WANDAH Students

. . . . In particular, we want to know what students using WANDAH think about it.

School _____

SITE VISIT INTERVIEWS

QUESTIONS FOR PRINCIPALS

1. Could you describe the process by which the WANDAH proposal was developed? For example, who was involved in the process at the district and at the school level? (Ask throughout for specific examples to illustrate general responses.)

2. Have you felt that there is district level (superintendent's office and school board) interest and support for the WANDAH project?

3. Do you believe that parents are supportive of the WANDAH project?

4. Has the use of WANDAH and computers to teach writing affected space utilization in the school? Is utilization the same, better, worse?

5. Have there been any changes in student-teacher ratios as a result of using WANDAH to teach writing?

6. In your opinion, is more, less, or the same amount of writing being taught as before?

7. Is writing being taught better, about the same, or worse?

8. Are there any parts of the English curriculum that are not being taught because of the emphasis on writing through WANDAH? Or, are there other parts of the curriculum about which more is being taught or which are being taught better?

9. Would you submit the WANDAH proposal again, or otherwise introduce the use of computers and WANDAH for teaching writing in your school? Or, what would you recommend to other schools in regard to the use of computers and WANDAH for teaching writing?

School _____

SITE VISIT INTERVIEWS

QUESTIONS FOR PROJECT DIRECTORS

1. What problems had to be solved in implementing the use of computers and WANDAH to teach writing? (Ask throughout for specific examples to illustrate general responses.)

   a. Technical?

   b. Support from district administration?

   c. School administration?

   d. Parents?

2. Do you feel that the WANDAH project has been successfully implemented?

3. Has the teaching load of the teachers involved been lighter, the same, or greater with the use of WANDAH?

4. Has WANDAH been easy or difficult to use--that is, have time and energy been saved, lost, or remained the same, with the use of WANDAH?

5. Do you think that the use of WANDAH has allowed teachers to teach more, less, or the same amount of writing?

   a. Grammar?

   b. Literature?

6. Has there been any imbalance in the English curriculum as the result of the use of WANDAH.

7. Has the implementation of the WANDAH project affected the way that writing is taught? For example, has there been more or less emphasis on the philosophy of teaching writing as process, or, has the computer been seen as a way to have students do basically the same writing assignments as before?

8. Have you noticed improvements in writing with WANDAH instruction over what you expected before WANDAH was implemented? If so, specifically what types of improvement?

9. Have you noticed any ways in which your students' writing has not improved as much as before? If so, specifically in what ways?

10. How do you think the students feel about the use of WANDAH? About specific parts of WANDAH? Has WANDAH affected students' general attitude toward writing?

School _____

SITE VISIT INTERVIEWS

INTERVIEW QUESTIONS FOR WANDAH TEACHERS

1. Has your teaching load been lightened, the same, or increased with the use of WANDAH?

2. Has WANDAH been easy or difficult to use--that is, have time and energy been saved or lost, or remained about the same with the use of WANDAH.

3. Do you think that the use of WANDAH has allowed you to teach more, less, or the same amount of writing?

   a. Grammar?

   b. Literature?

4. Has there been any imbalance in the English curriculum as the result of the use of WANDAH?

5. Has the implementation of the WANDAH project affected the way that you teach writing? For example, have you placed greater emphasis on the philosophy of teaching writing as process, or has the computer been a way to have students do basically the same writing assignments as before?

6. Has students' writing improved more during the school year with WANDAH instruction than it did before you used WANDAH? If so, specifically what types of improvement?

7. Have you noticed any ways in which your students' writing has not improved as much as before? If so, specifically, in what ways?

8. How do you think the students feel about the use of WANDAH? Specifically? Has use of WANDAH affected their general attitude toward writing?

9. Have you ever felt like the purpose of the WANDAH project is to use new technology rather than to teach writing better through the use of the computer and WANDAH?

School _____

Subject _____

SITE VISIT INTERVIEWS

QUESTIONS FOR NON-ENGLISH TEACHERS

1. Have you noticed any impact of the WANDAH project on the writing that students do for your classes? Quantity? Quality? Attitudes toward writing?

2. Do any of your students do their writing assignments for your classes using the computer and WANDAH?

3. Would you like your students to do their assignments using the computer and WANDAH?

4. Are there any other ways in which WANDAH has an impact on you as a teacher? Positive impacts? Concerns that you have?

School _____

SITE VISIT INTERVIEWS

INTERVIEW QUESTIONS FOR WANDAH STUDENTS

1. Do you like using WANDAH for writing? If so, why? If not, why not?

2. Do you think that you have learned how to write better with WANDAH than you would have without? If yes, in what ways specifically? If not, in what ways specifically?

3. For students who responded "yes" to the above question: Do you find that having learned to write using WANDAH and the computer helps you to write better even when you are writing with pen or pencil?

4. For students who answered "yes" to Question 2: Do you find that learning to write using WANDAH and the computer has helped your performance on writing assignments for other classes?

5. Has the use of WANDAH had any general effect on your attitude toward writing? That is, do you find writing generally to be more pleasurable and something you look forward more to doing, less so, or about the same?

6. What are the best and worst things about the program?

7. Would you like to see the program maintained in your school?

Appendix E

Posttest Writing Prompts and Instructions

COMPOSITION ACTIVITY (A)

Instructions for Teachers: Increased Homework

1. The students are to have 30 minutes to write in response to the prompt, "Increased Homework". Please time the writing period carefully.

2. Read the Student Instructions and the prompt aloud to the students prior to the 30-minute timed writing period.

3. Be sure the students put their name, school, grade level, and the date in the upper righthand corner of the first page of their paper, and that they put their name in the upper righthand corner of any additional pages that they write.

4. Be sure that each student has ruled 8 1/2 X 11, wide-lined paper to write on. Tell them that they can use no more than three pages for their composition. They should have sufficient space if they write on every line and avoid wide margins. Ask them not to squeeze their handwriting to gain more room.

5. Tell the students to write only on one side of each sheet of paper.

6. If any student writes on more than one page, please be certain that the pages are stapled together.

7. Students must write with number 2 pencils or ink so that their papers will be readable.

8. Do not answer students' questions about the prompt or about how to write the assignment.

9. Collect the students' papers promptly at the end of the 30-minute writing period.

10. Put the papers for each class in alphabetical order, please.

COMPOSITION ACTIVITY (A)

Student Instructions: Increased Homework

DIRECTIONS: You will have twenty minutes to plan and write a letter to the president of the Board of Education on a topic described on the next page. You may recall writing on this topic several months ago. We want to know how you respond to the topic now. Do not try to recall what you wrote earlier, but treat this as a new writing assignment.

Take ONE position either supporting or opposing the proposal discussed in the writing prompt. You are expected to express your thoughts carefully, naturally, and effectively. Be specific. Remember that how well you write is much more important than how much you write. Use a friendly letter format with "Mr. School Board President" as your salutation. Close your letter with "Sincerely, Dee Smith." DO NOT WRITE ON A TOPIC OTHER THAN THE ONE ASSIGNED IN THE WRITING PROMPT. A LETTER ON A TOPIC OF YOUR OWN CHOICE WILL RECEIVE NO CREDIT.

Write your name, your school, your grade level, and the date in the upper righthand corner of the first page of the paper.

You must write on 8 1/2 X 11 ruled paper with wide lines. Use either a number 2 pencil or a pen. PLEASE WRITE LEGIBLY.

When your teacher tells you that the 30 minutes are up, please stop writing. If you finish in less than 30 minutes, sit quietly in your seat until the time is up.

If you write on more than one page, be certain that your name is on each and that all of the pages are stapled together.

COMPOSITION ACTIVITY (A)

Writing Prompt: Increased Homework

Recently the National Commission on Excellence in Education claimed in their report, "A Nation at Risk," that American students are receiving only a mediocre education. Concerned about the education in this district, the Board of Education has requested that high school principals institute a new program of homework. It requires that teachers assign one hour of homework each evening in solid classes. The Board feels that this effort will force students to gain more than just a mediocre education.

Some teachers and parents object, arguing that homework does little to improve student learning because it lacks immediate teacher supervision, and that this suggestion puts undue pressure upon less capable students.

Write a letter to the president of the Board of Education supporting or opposing this proposal. Remember to take only one point of view. Organize your arguments carefully and be as convincing as possible.

COMPOSITION ACTIVITY (B)

Instructions for Teachers: An Influential Person

FIRST DAY:

1. The students are to have 30 minutes to write in response to the prompt, "An Influential Person". Please time the writing period carefully.

2. Read the Student Instructions and the prompt aloud to the students prior to the 30-minute timed writing period.

3. Be sure the students put their name, school, grade level, and date in the upper righthand corner of the first page of their paper, and their name in the upper righthand corner of any additional pages that they write.

4. Be sure that each student has ruled 8 1/2 X 11, wide-lined paper to write on.

5. Tell the students to write on one side of the paper only, emphasizing that they are to write on every other line.

6. If any student writes on more than one page, please be certain that the pages are stapled together.

7. Students must write with number 2 pencils or ink so their papers will be readable.

8. You may answer students' questions to clarify the prompt, but do not answer questions about how to write the assignment.

9. Given the limited amount of time, students should not use the dictionary. Tell them to spell any questionable words as best they can.

10. Collect the papers at the end of the 30-minute writing period.

11. Then, TELL THE STUDENTS THAT THEY WILL HAVE 30 MINUTES DURING THE NEXT CLASS MEETING TO REVISE THEIR PAPERS. Suggest that they think in the meantime about revisions that they might want to make.

12. Please do not discuss with the students their papers or possible revisions on them between class periods. It is important that both the initial piece of writing and the revisions be the student's unaided work. The purpose is to evaluate programs, not to evaluate classrooms or teachers.

COMPOSITION ACTIVITY (B)

Instructions for Teachers: An Influential Person

THE NEXT CLASS MEETING:

1. The students are to have 30 minutes to revise the papers written the previous period.

2. Hand their papers back to the students and then give the following instructions:

   a. Recall that, in writing the paper just handed back to you, you were to select a person who had influenced your life greatly and describe what you did and how you were influenced by the person. You were to give specific details and write so that a person your age would understand and appreciate what happened.

   b. You will now have 30 minutes to revise your paper.

   c. Put your revisions in the spaces left by writing on every other line when you first wrote the paper. If any revision is too long to fit in that space and still be legible, write it on a separate page. Number the revision on the separate page and then write that number with an arrow to indicate where it should be inserted in your paper. Be sure to write your name on any added page and staple it to your original paper.

3. Check that added revision pages have the student's name on them and are stapled to the original piece of writing.

4. Collect the papers promptly at the end of the 30-minute revision period.

5. Put the papers for each class in alphabetical order, please.

COMPOSITION ACTIVITY (B)

Student Instructions: An Influential Person

You will have 30 minutes to plan and write on the topic described on the next page. You may recall writing on this topic several months ago. We want to know how you respond to the topic now. Do not try to recall what you wrote earlier, but treat this as a new writing assignment.

Be sure to read the description of the topic carefully, and express your thoughts as carefully and as effectively as you can. Be specific as requested, and include examples. How well you write is more important than how much you write. DO NOT WRITE ON A TOPIC OTHER THAN THE ONE ASSIGNED AS THE TOPIC. WRITING ON ANOTHER TOPIC WILL RECEIVE NO CREDIT.

Write your name, your school, your grade level, and the date in the upper righthand corner of the first page of the paper.

You must write on 8 1/2 X 11 ruled paper with wide lines. WRITE ON EVERY OTHER LINE. Use either a number 2 pencil or a pen. PLEASE WRITE LEGIBLY.

When your teacher tells you that the 30 minutes are up, please stop writing. If you finish in less than 30 minutes, sit quietly in your seat until the time is up.

If you write on more than one page, be certain that your name is on each and that all of the pages are stapled together.

COMPOSITION ACTIVITY (B)

Topic: An Influential Person

Other individuals can influence our lives greatly, often without being aware they are doing so. Look back over your life and think of one or two persons who have influenced you to do something about which you now feel proud or which you wish had not happened.

Select one such person to write about. (You need not give the person's real name.) Describe what you did and how the person influenced your behavior. Using specific details, write so that another person your age would understand and appreciate what happened.

Appendix F

Revision Tally Sheet and Scoring Instructions
and Attitude Surveys

ID#_____ Coder Initials_____

Wandah Revision Tally Sheet

	Tally	Wandah	Non-Wandah
I. MECHANICAL CHANGES			
A. Punctuation			
parentheses			
brackets			
quotation marks			
ellipses			
question marks			
abbrev. and titles			
comma			
period			
capitalization			
Total			
B. Word Choice			
commonly confused pairs			
language level			
language substitution			
Total			
C. Spelling			
changes			
Total			
D. Grammatical Function			
subject/verb agreement			
verb tense			
Total			
Overall Total		Wandah	Non-Wandah

	Tally	Wandah
II. STYLE CHANGES		
A. Sentence Length		
shortening by combining sentences		
shortening by deleting words within		
deleting prepositional phrases		
dividing into two sentences		
adding words		
Total		
B. Passive Voice		
elimination of "be" verbs		
C. Abstract Words		
substitution of concrete terms		
D. "tion" or "sion" words		
change to active verbs		
E. Gender Specific Nouns and Pronouns		
deletion		
change to genderless term		
Total		
Overall Total		Wandah

	Tally	Wandah	Non-Wandah
III. ORGANIZATIONAL AND CONTENT CHANGES			
A. Transition Words and Phrases			
between paragraphs			
within sentences			
between sentences			
Total			
B. Pronoun Reference			
between paragraphs			
within sentences			
between sentences			
Total			
C. Content Changes			
addition of information			
deletion of information			
Total			
D. Structural Changes			
Overall Total		Wandah	Non-Wandah
146 Grand Total		Wandah	Non-Wandah

Instructions to Readers for Revision Scoring

The papers you will be reading have been written by Utah high school students as a result of a prompt provided as part of the evaluation of the Wandah program (see the prompt at the end of these instructions). Before starting the actual scoring of the essays, we will review the revision analysis scoring guide you will be using. Try to familiarize yourself as rapidly as possible with the format and keep the following items in mind as you read.

1. Students were given these instructions for revision:

   > Put your revisions in the spaces left by writing on every other line when you first wrote the paper. If any revision is too long to fit in that space and still be legible, write it on a separate page. Number the revision on the separate page and then write that number with an arrow to indicate where it should be inserted in your paper.

2. We are reading only for evidence of revision; no judgment is being made about the quality of those changes at this time. Hence, this scoring is a frequency count, not a qualitative one.

3. As much as you may be tempted to "read" the essays, try to avoid this; concentrate only on identifying the revision changes and recording them appropriately.

4. Handwriting may become a factor in your reading; if you are uncertain of a change, request assistance from the Head Reader.

5. Make no marks on the essays whatsoever.

6. Fill out a scoring sheet for each essay even if no changes appear. Be certain each sheet carries the correct identification number and the coding number which you will be assigned at the start of the session.

7. Use either a checkmark system or a slash (/) system for recording each change in a category.

8. Be careful to get your marks in the appropriate column.

9. TALLY ONLY EACH CATEGORY--DO NOT TAKE TIME TO PUT DOWN OVERALL TOTALS.

10. If an essay has numerous changes in it, you may find the scoring easier if you read the essay three times, each time for a different category.

11. If you encounter a change not covered by the scoring sheet, make a legible note at the bottom of the sheet with some indication of what the change is and how many times it occurs. NOTE: IN CASES SUCH AS THIS, CONSULT WITH THE HEAD READER BEFORE MAKING THE NOTATION.

12. Read as rapidly as you can while still maintaining accuracy

in recording. If you find yourself getting tired--eye strain will be a factor, not to mention "butt fatigue,"--feel free to move around quietly, help yourself to refreshments, visit the rest rooms, etc. Please be as quiet as possible, however, since others may be trying to concentrate on their reading.
NOTE: WE WILL TAKE BRIEF BREAKS ON THE HOUR BUT WE DO NEED TO ACCOMPLISH OUR TASK IN THE TIME WE HAVE AVAILABLE IF AT ALL POSSIBLE.

IF AT ANY TIME YOU ARE UNCERTAIN HOW TO PROCEED, RAISE YOUR HAND AND THE HEAD READER WILL CONSULT WITH YOU AS SOON AS POSSIBLE AND ATTEMPT TO ANSWER YOUR QUESTIONS.

Student Prompt

Topic: An Influential Person

Other individuals can influence our lives greatly, often without being aware they are doing so. Look back over your life and think of one or two persons who have influenced you to do something about which you now feel proud or which you wish had not happened.

Select one such person to write about. (You need not give the person's real name.) Describe what you did and how the person influenced your behavior. Using specific details, write so that another person your age would understand and appreciate what happened.

OPINIONS ABOUT WRITING SURVEY

Instructions for Administration:

1. Explain to the students that they may remember completing a survey on their opinions about writing last October. Their beliefs are again of interest as part of a project in which the district is participating. Their opinions right now are of interest. They should not try to remember what they said earlier.

2. Hand out the survey forms, and ask the students to fill in the information at the top of the page.

3. Read the survey Directions aloud to the students. Be sure they know how to mark the items. (If the question comes up, tell the students to ignore the numbers below the responses to be circled. They are only for use of the keypunch operator who will put the data on IBM cards.)

4. Explain to the students that four items (i.e., #5, 18, 21, 31) refer to a "composition course", and that simply means a language arts class in which they write compositions.

5. Ask students to work quickly, and to sit quietly when they finish until all are done. It should take no longer than 20 minutes for students to complete the survey.

6. Put the papers for each class in alphabetical order, please.

3/5/85

ıme _____ School _____ Grade _____

OPINIONS ABOUT WRITING SURVEY

.rections: Below are a series of statements about writing. There are no right or wrong ıswers to these statements. Please indicate the degree which each statement applies to ɔu by circling whether you strongly agree (SA), agree (A), are uncertain (U), disagree), or strongly disagree (SD) with the statement. While some of these statements may :em repetitious, take your time and try to be as honest as possible. Please complete 'ery item. Thank you for your cooperation.

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
. I avoid writing.	SA (5)	A (4)	U (3)	D (2)	SD (1)
. I have no fear of my writing being evaluated.	SA (1)	A (2)	U (3)	D (4)	SD (5)
. I look forward to writing down my ideas.	SA (1)	A (2)	U (3)	D (4)	SD (5)
. I am afraid of writing essays when I know they will be evaluated.	SA (5)	A (4)	U (3)	D (2)	SD (1)
. Taking a composition course is a very frightening experience.	SA (5)	A (4)	U (3)	D (2)	SD (1)
. Handing in a composition makes me feel good.	SA (1)	A (2)	U (3)	D (4)	SD (5)
. My mind seems to go blank when I start to work on a composition.	SA (5)	A (4)	U (3)	D (2)	SD (1)
. Expressing ideas through writing seems to be a waste of time.	SA (5)	A (4)	U (3)	D (2)	SD (1)
. I would enjoy submitting my writing to magazines for evaluation and publication.	SA (1)	A (2)	U (3)	D (4)	SD (5)
. I like to write my ideas down.	SA (1)	A (2)	U (3)	D (4)	SD (5)
. I feel confident in my ability to express my ideas clearly in writing.	SA (1)	A (2)	U (3)	D (4)	SD (5)
. I like to have my friends read what I have written.	SA (1)	A (2)	U (3)	D (4)	SD (5)
. I'm nervous about writing.	SA (5)	A (4)	U (3)	D (2)	SD (1)
. People seem to enjoy what I write.	SA (1)	A (2)	U (3)	D (4)	SD (5)
. I enjoy writing.	SA (1)	A (2)	U (3)	D (4)	SD (5)

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
16. I never seem to be able to write down my ideas clearly.	SA (5)	A (4)	U (3)	D (2)	SD (1)
17. Writing is a lot of fun.	SA (1)	A (2)	U (3)	D (4)	SD (5)
18. I expect to do poorly in composition classes even before I enter them.	SA (5)	A (4)	U (3)	D (2)	SD (1)
19. I like seeing my thoughts on paper.	SA (1)	A (2)	U (3)	D (4)	SD (5)
20. Discussing my writing with others is an enjoyable experience.	SA (1)	A (2)	U (3)	D (4)	SD (5)
21. I have a terrible time organizing my ideas in a composition course.	SA (5)	A (4)	U (3)	D (2)	SD (1)
22. When I hand in a composition I know I'm going to do poorly.	SA (5)	A (4)	U (3)	D (2)	SD (1)
23. It's easy for me to write good compositions.	SA (1)	A (2)	U (3)	D (4)	SD (5)
24. I don't think I write as well as most other people.	SA (5)	A (4)	U (3)	D (2)	SD (1)
25. I don't like my compositions to be evaluated.	SA (5)	A (4)	U (3)	D (2)	SD (1)
26. I'm no good at writing.	SA (5)	A (4)	U (3)	D (2)	SD (1)
27. Writing on a computer is more fun than writing with pencil and paper.	SA (1)	A (2)	U (3)	D (4)	SD (5)
28. All students should do some writing on a computer.	SA (1)	A (2)	U (3)	D (4)	SD (5)
29. People who write on computers become better writers than they would otherwise.	SA (1)	A (2)	U (3)	D (4)	SD (5)
30. Using a computer to write just makes writing more difficult.	SA (5)	A (4)	U (3)	D (2)	SD (1)
31. The students in every composition class should have access to a computer to write on at school.	SA (1)	A (2)	U (3)	D (4)	SD (5)
32. A computer program is not likely to be of much help in revising a paper.	SA (5)	A (4)	U (3)	D (2)	SD (1)
33. Students would learn more if they could do the writing assignments in all of their classes on a computer.	SA (1)	A (2)	U (3)	D (4)	SD (5)
34. Learning to write on a computer is more trouble than it's worth.	SA (5)	A (4)	U (3)	D (2)	SD (1)
35. Computer programs can be helpful in deciding how to improve a paper.	SA (1)	A (2)	U (3)	D (2)	SD (1)

Appendix G

Holistic Scoring Procedures and Guidelines

The procedures for each scoring session were identical and are explained in the enclosed materials as are the procedures for table leaders. We used the same procedures for training readers each time:

1. Reviewed the prompt and the circumstances surrounding the writing of the essays.

2. Explained the difference between scoring and grading.

3. Stressed the need for consistency in holistic scoring.

4. Reviewed the scoring guide and procedures.

5. Scored a sample packet of six papers; then recorded individual scores on a grid which was placed on the chalkboard.

6. Scored a second sample of six papers; recorded each reader's scores on a second grid.

7. Selected key papers from the two scorings and discussed the application of the scoring categories to the papers; in this way we began to refine people's thinking about the scoring categories. Once there was reasonable consensus, we moved to step 8.

8. Scored a third sample of papers; recorded individual reader's scores on a third grid. Discussed, once again, scores from the three grids; finally decided on range markers for each category (samples available on request).

9. Began official scoring. During this time, table leaders monitored the scoring of each of their readers—every 5th paper during the first hour; every 10th paper during the remaining hours; conferenced with those readers who seemed to be scoring extremely high or extremely low. Table leaders also did some scoring of their own when time permitted, as did the Head Reader.

The Head Reader conducted the training sessions, identified the papers to be read by each table, color coded papers for second readings, monitored the activities of the table leaders, and did third readings.

Wandah Evaluation Project

Holistic Scoring

Directions to TABLE LEADERS:

You have received a copy of the instructions to the readers at your table. In addition to monitoring that those instructions are followed carefully, you are asked to do the following:

Before the Official Reading

1. Arrange people at their tables so each reader has sufficient room for materials and so that you have easy access to them for conferring as necessary.

2. Doublecheck to determine if all your readers have the necessary materials.

3. Participate in the practice session; score the sample papers yourself; observe carefully the scores of your readers and the kinds of questions asked. Although the Head Reader will conduct the practice session, be prepared to assist when necessary.

During the Official Reading

1. Monitor the reading at your table; encourage readers to stay on task and discourage any conversation among readers during the reading time.

2. See that your readers have a steady flow of papers; the Head Reader will see that you have a constant supply with which to keep your readers supplied.

3. Collect scored papers periodically from your readers; for each reader in the first hour of reading, spot check about every fifth paper; after the first hour, spot check about every tenth paper. This means you should read the paper and assign it a score without first looking at the reader's score; then compare. If you disagree more than one level, spot check another paper from that reader; if you disagree on that one as well, consult with the reader. Note: THOSE PAPERS THAT YOU READ AND SCORE A SECOND TIME, BE CERTAIN TO FOLLOW THE DIRECTIONS BELOW FOR SCORING SECOND READINGS; THESE PAPERS SHOULD NOT GO INTO THE ROUTING FOR A SECOND SCORING BUT SHOULD BE CONSIDERED FINISHED AND PUT IN THE APPROPRIATE PLACE AFTER THE TALLY ON THE FRONT HAS BEEN MADE.

4. Handle discrepancies in scoring as unobtrusively as possible. If a reader appears to be scoring too high or too low, select some papers you feel represent the appropriate range and ask the reader to score them; if the scores are still not appropriate, take the reader aside--away from other readers--and confer with the reader on how the misscored papers fit the criteria of the boundary categories. In other words, if the

reader scores a paper a 1 and it should be a 3, ask the reader to compare the paper with a 4 and then with a 2 and finally with a 3; work on comparisons with boundary categories, not comparisons with other papers in the misscored category. If differences cannot be resolved, consult with the Head Reader.

5. Pay particular attention to papers which show color on the first page; these already will have been read once; your readers will place their scores on the front page in the upper left hand corner. When you pick them up from your readers, check to be certain the score is where it is supposed to be; then do the following:

   a. check the back of the last page for a score

   b. if that score agrees with the one on the first page or is within one level of it, add the two scores together and place the total at the top center of the first page; circle that score and underline it twice; BOLDLY PRINTED NUMBERS will help.

   c. if the scores do not agree, note who the second reader was from your table; spot check the reader on a few more papers. In the meantime, GIVE ALL PAPERS WHICH NEED A THIRD READING to the Head Reader. If discrepancies continue with a reader, check with the Head Reader so that adjustments can be made if necessary.

   d. after any break, be particularly alert to early readings to make certain readers are still consistent in their scoring.

   e. if you have time--after all of this--go ahead and score some papers yourself but do not do this at the expense of monitoring the table readers. Consistency is an important element for all of us during these sessions.

6. Since we will have two days of this scoring, please pass on to the Head Reader any ideas you gain from the first day's reading which might make the second day go more efficiently.

7. We appreciate your willingness to serve in this role and hope that the experience will be beneficial to you as well as to the readers working with you.

Wandah Evaluation Project

Holistic Scoring

Directions to Readers:

The papers you are about to read were written by Utah high school students. You will find a prompt attached to this sheet which indicates the assignment students were given. Our efforts today are to score the papers, using a rubric designed specifically for the prompt and the student population. You will receive this rubric separately and will practice with it until you are familiar with its categories and until the group of readers as a whole has developed consistency in its use.

If you are unfamiliar with holistic scoring, you should be aware that research has shown that the process is as valid and reliable as the more traditional--and slower--analytical scoring of writing samples. In holistic scoring, you are to use a "whole impression" of the work which reflects the various characteristics of the scoring rubric to determine where the piece of writing falls on a given scale. No single item or characteristic is necessarily more important than another in this system; in fact, holistic scoring is not designed to be diagnostic but is more useful in showing large scale changes within a given population and for placing students in appropriate courses or programs. Our intent in this particular evaluation project is to determine what changes, if any, have occurred in student writing over a certain period of time.

Since we will be reading a large number of papers and accuracy is of great importance, we ask that you observe the following procedures carefully; if you have questions at any time, feel free to consult your table leader or if he or she is busy, the Head Reader.

Before the Official Reading

1. Arrange your materials carefully so that you can refer to them easily and efficiently; you will have the following as resources:

   a. copy of the prompt used for the writing
   b. copy of the rubric--you may want to unstaple the pages for easier reference
   c. copies of "range" markers for each category on the rubric (these will be provided during practice)
   d. two marked spaces in front of you; one of these will be for papers you are to score; the other will be for papers you have scored and which are ready for pick-up
   e. pencil for recording scores

2. Feel free to ask questions during the practice session. We need to train quickly, but we also need to understand clearly what we are doing; your table leader and the Head Reader will attempt to answer your questions. Listen carefully to the discussion, apply the rubric carefully, and observe how your scores compare with those of the group. The basic purpose

of the training session is to reach consensus on the application of the rubric to the writing samples.

During the Official Reading

1. Resist the temptation to read an excerpt to another reader; there will be ample time to swap choice bits with each other during the breaks.

2. Give to your table leader any illegible papers which you feel are beyond any effort at reading; handwriting on some of the papers will not be good but try not to let that influence you unduly; remember that students had little time to consider overall neatness.

3. Read as quickly as possible and try to score your first impression; if you find yourself re-reading papers, you probably have lost confidence in your memory of the rubric; review the categories and then start reading again. Remember that the goal is overall impression. Isolating one part over another tends to reduce your effectiveness as a reader.

4. Record the appropriate score in the location as indicated by the following code:

   a. NO COLOR ON FIRST PAGE--record score on the back of the LAST PAGE in the CENTER of that page; be sure the number is formed clearly.

   b. COLOR ON FIRST PAGE--record score at the top left hand corner of the FIRST PAGE; be certain the number is formed clearly.

5. Place all scored papers on the "Out" pile in front of you; these papers will be picked up by the table leader periodically. Your table leader and/or the Head Reader may read some of these at random, simply to insure that all readers are using the rubric appropriately; on occasion, your table leader or the Head Reader may discuss some of your scores with you to make certain that you and he or she have a consensus on the scores. Remember that the success of this kind of evaluation depends upon consistency in scoring.

Other Considerations

1. We will take periodic breaks--reader fatigue is a definable factor in these sessions--so that you can obtain refreshments, visit the rest rooms, get some fresh air. These breaks, however, will be short--seldom more than ten minutes except for a lunch break. Please be prompt in starting reading again as soon as the signal is given.

2. You will find reading these papers provides you with some insights into how today's teenagers think and also how they respond to a writing situation. You may or may not agree with their stands on an issue or their choices of subject;

Your focus at all times, however, must be on evaluating the papers against the rubric, not against your own personal beliefs or expectations.

3. We appreciate the time you are giving us for the scoring session. If it is necessary for you to leave before the time allotted for scoring is over, please inform the Head Reader so that the time you did spend can be recorded.

Holistic Scoring Rubric
(Homework)

0
Papers at this level will be illegible, illiterate, incoherent, totally unrelated to the assigned topic or exhibit no response; such papers should be given to the head reader.

1
Papers at this level will

a. offer a vague or contradictory position on the issue

b. ignore the existence of opposing views

c. provide no consistent defense for a position or only a rambling, generalized discussion; some aspects of the discussion may have nothing to do with the issue

d. provide no clear introduction or conclusion

e. usually consist of one or two paragraphs with ineffective structure and little or no attention to transitions or coherence

f. read as a non-unified discussion

g. acknowledge the audience being addressed but use inappropriate language

h. display excessive sentence construction problems

i. exhibit a high frequency of grammatical, punctuation, spelling, and capitalization errors which seriously impede reading.

2
Papers at this level will

a. offer a stated or contradictory position on the issue

b. ignore the existence of an opposing view

c. provide no more than one basic argument which will be repeated several times with unoriginal and often vague examples; personal experience may or may not be present

d. ignore usually a separate introduction or conclusion

e. use paragraphing ineffectively and transitions often will be missing

f. read as a random collection of thoughts with little or no attention to order or relative importance

g. reveal inconsistent awareness of audience and usually inappropriate use of language

h. use simple sentence construction marred by frequent run-ons and/or sentence fragments

i. exhibit sufficient numbers of spelling, punctuation and/or capitalization errors to impede reading severely.

3
Papers at this level will

a. offer a stated or suggested position on the issue

b. be unlikely to acknowledge existence of opposing view

c. provide only one or two arguments that will tend to be developed repetitively with generalized examples; personal experience may or may not be used

d. provide little or no introduction or conclusion

e. use paragraphs inconsistently, with a number consisting of only one or two sentences, or the paper consists of one paragraph; transitions will be weak

f. read as somewhat rambling discourse with arguments not tied together smoothly and often appearing to be offered on a random basis

g. acknowledge audience being addressed but not always with appropriate language

h. show inconsistent control of sentence structure; some run-ons and/or fragments may be present; little sentence variety

i. exhibits sufficient numbers of errors in spelling, punctuation or capitalization to interfere with reading.

4
Papers at this level will

a. offer a clearly stated or suggested position on the issue

b. be unlikely to acknowledge the existence of opposing views

c. provide only one or two arguments which will be supported by underdeveloped examples; personal experience may or may not be used

d. provide a perfunctory introduction and conclusion

e. use paragraphing with general effectiveness but development within paragraphs may be limited and not always coherent; transitions will be generally effective

f. read as not an entirely coherent piece

g. acknowledge the audience being addressed and generally use appropriate language

h. show some variation in sentence construction

i. exhibit more spelling, punctuation or capitalization errors than a 5 or 6 paper.

5
Papers at this level will

a. offer a clearly stated or implied position on the issue

b. present either one substantially developed argument or several moderately well developed arguments supported by examples which reflect some originality and/or personal experience

c. acknowledge usually the existence of opposing views

d. provide an introduction and conclusion but not always as separate units

e. use paragraphing effectively and move from point to point with clear transitions

f. suggest a structure of parts--arguments appear in sections but do not always relate to each other smoothly, leaving readers without a full sense of coherence

g. acknowledge the audience being addressed and use appropriate language to strive for some consistency in tone and voice.

h. use varied sentence construction but not always appropriate for emphasis; may lack somewhat in complexity

i. exhibit few spelling, punctuation or capitalization errors.

6
Papers at this level will

a. offer a clearly stated or implied position on the issue

b. acknowledge existence of opposing views and merits of those views

c. provide several arguments supported by factual examples and/or personal experience which reflect thoughtfulness and some originality

d. provide a recognizable and separate introduction and conclusion

e. use paragraphing effectively and move from point to point with clear transitions

f. read as a coherent discussion of the issue

g. acknowledge the audience being addressed and use appropriate language to maintain a consistent tone and voice

h. use varied sentence construction

i. exhibit few, if any, spelling, punctuation or capitalization errors.

Holistic Scoring Rubric
(Influential Person)

0
Papers at this level will be illegible, illiterate, incoherent, totally unrelated to the assigned topic or exhibit no response; such papers should be given to the head reader without scoring.

1
Papers at this level will

a. offer only a vague identification of an influential person and may not indicate whether the influence was positive or negative

b. provide highly generalized examples which offer little indication of what the writer did

c. display few details that will describe what happened and why it was significant

d. omit introduction or conclusion; simply will plunge into the paper and never place the material in perspective for the reader

e. exhibit consistently underdeveloped paragraphs or no paragraphing sense at all and show little awareness of the role of transitions within or between paragraphs

f. offer a rambling, unfocused discussion

g. show difficulty with consistently appropriate language use

h. reveal lack of sentence sense

i. contain high numbers of errors in spelling, punctuation and/or capitalization which dramatically interfere with reading.

2
Papers at this level will

a. select one or more people who are only vaguely identified but the influence of the person is identified as positive or negative

b. provide highly generalized examples, some of which may not appear to be clearly related to the purpose of the paper

c. use highly generalized details to describe the writer's action and why it was significant

d. provide no clear introduction or conclusion

e. have difficulty with paragraphing; paper may simply be one long paragraph or a series of short underdeveloped ones; transitions within are weak or non-existent

f. suggest a rambling, unconnected discussion

g. reveal some difficulty with appropriate language use

h. exhibit frequent sentence construction problems, including fragments and run-ons

i. exhibit sufficiently high numbers of errors in spelling, punctuation and/or capitalization to interfere seriously with reading.

3
Papers at this level will

a. select one or more individuals and focus on those persons' influence on the writer, indicating if the influence was positive or negative

b. provide generalized examples of what the writer did as a result of the individual's influence

c. rely on generalized details to describe action taken by the writer as a result and suggest why it was significant

d. reveal no separate introduction and conclusion; introduction and conclusion may consist of only one or two sentences within "body" paragraphs

e. reveal some uncertainty about paragraphing by having several one or two sentence paragraphs or the paper will be all one paragraph; transitions will show some weakness within as well as between paragraphs.

f. suggest a not thoroughly focused discussion

g. use language generally appropriate for intended audience

h. exhibit little variety in sentence construction and will display some recurring problems with run-ons and/or sentence fragments

i. exhibit sufficient numbers of errors in spelling, punctuation, and capitalization to cause some interference with reading.

4
Papers at this level will

a. select one person and focus on the influence that person had in the writer's life, indicating if the influence was positive or negative

b. provide one or two moderately specific examples of what the writer did as a result of the individual's influence

c. displays a sense of voice and some consistency in tone

d. use somewhat generalized details to describe the action taken by the writer, and to suggest why it was significant

e. offer a perfunctory beginning and ending which may or may not be separate from the body of the piece

f. show a fairly consistent sense of paragraphing, with some minor problems in development or placement; transitions are limited but appropriate

g. tend to display some parts which may not seem to connect smoothly with others

h. use appropriate but general language for the intended reader

i. exhibit simple sentence construction but with no major problems; little complexity apparent

j. exhibit more spelling, punctuation and/or capitalization errors than five or six papers but meaning is not severely compromised.

5
Papers at this level will

a. select one person and focus on that person's influence in the writer's life, indicating if the influence was positive or negative

b. provide one or more concrete examples of what the writer did as a result of the individual's influence

c. displays a good sense of voice and consistency in tone

d. use specific details which describe the action taken by the writer so the reader can understand what happened and why it was significant

e. employ a general introduction which may suggest a focus for the paper and a conclusion which will offer a general summary

f. show a generally effective use of paragraphing and use transitions in obvious but appropriate ways

g. provide a generally coherent discussion but with perhaps one or two unclear relationships

h. use appropriate but not always original language suitable for the audience

i. display varied sentence construction but not always with attention to emphasis; may also demonstrate some lack of complexity in the construction

j. exhibit few spelling, punctuation or capitalization errors.

6
Papers at this level will

a. select one person and focus on that person's influence in the writer's life, indicating if the influence was positive or negative

b. provide one or more concrete examples of what the writer did as a result of the individual's influence

c. displays a good sense of voice and consistency in tone

d. use highly specific details which describe the action taken by the writer so the reader can understand what happened and why it was significant

e. begin with a clear introduction which sets the direction of the paper and ends with a clear conclusion that puts the individual's influence in perspective for the reader

f. use paragraphing effectively and use transitions appropriately within, as well as between, paragraphs

g. provide an overall coherent discussion

h. use appropriate language consistently for the intended audience

i. exhibit varied sentence construction which lends interest and reveals complexity of thought and action

j. exhibit few, if any, spelling, punctuation or capitalization errors.

Appendix H

Descriptions of Dependent Measures

WANDAH EVALUATION

Dependent Measures

Opinions About Writing Survey

This 26-item instrument, developed by John A. Daly and Michael D. Miller ("The Empirical Development of an Instrument to Measure Writing Apprehension", Research in the Teaching of English, 1975, 9, pp. 242-249), is intended to assess attitudes toward writing. It is scored so that the lower the score, the better the attitude. Identified on the computer printout as PRSURTOT, for the pretest, and POSURTOT, for the posttest.

Opinions About Writing with Computers

This nine-item instrument was administered only as a posttest. The items were developed by the statewide evaluator and included with the Opinions About Writing Survey items. As with the Opinions About Writing Survey, lower scores indicate better attitudes about using computers to write. Identified on the computer printout as COMPTOT.

Holistic Measures

Two holistic writing samples were scored. The first was based on the "Increased Homework" prompt which was given in May of 1985 and again in April-May 1986. The other came from the "An Influential Person" prompt, administered in October 1985 and April-May 1986 as a revision exercise. The students' revised writing samples were scored holistically. To obtain a more reliable holistic score, the scores from the two writing samples were combined. On the computer printouts, Increased Homework is identified as PRHOLLT (LT standing for letter) on the pretest, and as POHOLLT on the posttest; "An Influential Person" is identified as PRHOLIN on the pretest, and POHOLIN for the posttest; the sum of the two is indicated by PRHOLTOT on the pretest and POHOLTOT on the posttest.

Revision Scores

A coding instrument (enclosed) for identifying revisions was developed for this project and used on the "An Influential Person" revised writing sample. Initially, the instrument included only revision categories from the WANDAH program. As the developer (Dr. Charles Duke, Utah State University) tried out the coding instrument, it became clear that a number of other types of revisions had been made by students, and nonWANDAH categories were added to the instrument. Finally, in training coders to use the instrument, it was decided that one other type of revision needed to be added under "III. Organizational and Content Changes"; it is, "D. Structural Changes." That title appears on the bottom of the instrument. The subcategories are not listed. They are: Replacement of Information (rewording without altering meaning, usually consisting of the same number of words); Recognition by

Omission (words inserted that seem to have been left out in haste or carelessness, or words deleted that had been written in redundantly); Paragraph Change (insertion of a symbol to indicate a new paragraph, or that a paragraph break is to be ignored); Paragraph Order Change (arrows or notes used to indicate the change in placement of paragraphs); and, Sentence/Word Order Change/Movement (changes in the order of words or sentences indicated by a line or arrow).

Three subscores on the coding instrument--WANDAH Mechanical Changes, Style Changes, and Organizational and Content Changes--were summed to get a total WANDAH Revisions score. Two subscores--nonWANDAH Mechanical Changes and Organizational and Content Changes--were summed to get a nonWANDAH Revisions score. The WANDAH and nonWANDAH Revisions scores were summed to obtain a Total Revisions score. WANDAH Revisions is indicated on the computer printout by PRTOTWD for the pretest and POTOTWD for the posttest; nonWANDAH Revisions is indicated on the computer printout by PRTOTNWD for the pretest and POTOTNWD for the posttest; and, Total Revisions is indicated by PRRVTOT for the pretest and PORVTOT for the posttest.

Means and standard deviations were quite low for some of the categories summed to obtain the WANDAH and nonWANDAH Revisions scores. It is doubtful that scores on those categories should be analyzed (although some computer printouts may have analyses of those scores on them); and, it is likely that the limited variability (which is reflected in the means and standard deviations for individual schools) is the reason for the relatively low alpha coefficients for the Total Revisions scores, despite the high inter-rater correlations.

Appendix I

Pretest and Posttest Means and Standard Deviations
(Tables 4 through 11)

Table 4

Pretest and posttest means and standard deviations for TOTWD (total WANDAH revision) scores.

School	Grade	N	Pre[a]	Post[a]	r[b]	Change	$\bar{G}_x - \bar{G}_w$[c]	r^2_{pb}
A	11	12	.58 (.67)	.42 (.79)	.01	-.17	-.30	.00
	12	14	.29 (.47)	.36 (.63)	-.11	.07	+.86	.04
B	11	17	1.82 (2.63)	2.29 (3.72)	.18	+.47	+.34	.01
	12	14	3.00 (2.48)	3.36 (2.62)	-.19	+.36	+1.14	.06
C	11	25	.32 (.90)	.48 (1.05)	-.17	+.16	+.03	.00
	12	27	.93 (2.05)	3.18 (2.87)	.03	2.26*	+3.05	.33
D	11	24	.96 (1.60)	.71 (1.46)	.12	-.25	-.38	.01
	12	15	.87 (1.06)	.40 (.63)	.19	-.47	+.32	.01
E	11	23	2.52 (3.07)	2.61 (2.35)	-.27	+.09	-.04	.00
F	11	21	1.24 (2.30)	1.81 (2.25)	.51	+.57	+.44	.01
	12	20	1.80 (2.04)	.10 (.31)	-.30	-1.70*	-.91	.04
G	7	13	1.08 (1.60)	2.69 (4.07)	.27	+1.61		
	8	16	2.19 (3.43)	2.00 (2.03)	.25	-.19		
	10	15	1.47 (1.64)	.87 (1.41)	-.19	-.60		
	11	16	1.06 (1.84)	.87 (1.63)	-.24	-.19	-.32	.01
	12	5	.00 (.00)	1.60 (3.58)	.00	+1.60	+2.39	.23
H	11	39	1.36 (2.01)	1.49 (2.40)	.01	+.13		
	12	33	1.70 (2.54)	.91 (1.63)	.43	-.79		

[a]Standard deviations are in parentheses.
[b]Correlation between pretest and posttest scores.
[c]The mean gain for the project group minus the mean gain for the Weber comparison group.
*Statistically significant at the .05 level.

Table 5

Pretest and posttest means and standard deviations for TOTNWD (total nonWANDAH revisions) scores.

School	Grade	N	Pre[a]	Post[a]	r[b]	Change	$\bar{G}_x - \bar{G}_w$[c]	r^2_{pb}
A	11	12	2.00 (2.30)	.83 (1.75)	.02	-1.17	-.64	.01
	12	14	.57 (.76)	1.79 (2.58)	.15	+1.21	+3.30*	.15
B	11	17	4.53 (3.55)	5.65 (4.99)	.63	+1.12	+2.14	.07
	12	14	6.64 (3.79)	6.71 (5.62)	.05	+.07	+2.16	.07
C	11	25	1.28 (1.70)	1.00 (1.78)	.17	-.28	+.74	.01
	12	27	.81 (1.41)	4.07 (2.96)	-.12	+3.26*	+5.38*	.32
D	11	24	2.67 (5.80)	2.37 (3.48)	-.06	-.29	+.73	.01
	12	15	1.33 (2.41)	1.67 (2.13)	-.10	+.33	+2.42*	.09
E	11	23	3.52 (3.91)	5.48 (4.80)	.31	+1.96	+2.98*	.13
F	11	21	2.57 (3.26)	2.48 (2.91)	.40	-.09	+.93	.01
	12	20	3.05 (3.25)	.20 (.70)	.06	-2.85*	-.76	.01
G	7	13	2.92 (2.22)	2.54 (2.07)	.34	-.38		
	8	16	5.75 (6.13)	3.00 (2.31)	.62	-2.75*		
	10	15	3.00 (3.05)	3.60 (6.17)	.16	+.60		
	11	16	[illegible]2 (6.38)	2.37 (4.88)	-.32	-2.25	-1.22	.02
	12	5	.00 (.00)	2.80 (5.72)	.00	2.80	+4.89*	.28
H	11	39	3.41 (3.73)	2.38 (3.51)	.07	-1.02		
	12	33	3.56 (4.25)	1.48 (2.17)	.54	-2.09*		

[a]Standard deviations are in parentheses.
[b]Correlation between pretest and posttest scores.
[c]The mean gain for the project group minus the mean gain for the Weber comparison group.
*Statistically significant at the .05 level.

Table 6

Pretest and posttest means and standard deviations for RVTOT (total revisions, WANDAH plus nonWANDAH) scores.

School	Grade	N	Pre[a]	Post[a]	r[b]	Change	$\bar{G}_x - \bar{G}_w$[c]	r^2_{pb}
A	11	12	2.58 (2.57)	1.25 (2.05)	.11	-1.33	-.43	.00
	12	14	.86 (.95)	2.14 (3.11)	.01	+1.29	+4.16*	.44
B	11	17	6.35 (5.22)	7.94 (7.82)	.49	+1.59	+2.49	.05
	12	14	9.64 (4.40)	10.07 (7.30)	-.06	+.43	+3.31	.09
C	11	25	1.60 (2.22)	1.48 (2.58)	.15	-.12	+.78	.00
	12	27	1.74 (2.84)	7.26 (4.41)	.13	+5.52*	+8.40*	.38
D	11	24	3.62 (6.95)	3.08 (3.98)	.10	-.54	+.36	.00
	12	15	2.20 (3.10)	2.07 (2.46)	-.07	-.13	+2.74	.06
E	11	23	6.04 (6.28)	8.09 (5.97)	.19	+2.05	+2.95	.07
F	11	21	3.81 (5.31)	4.29 (4.64)	.54	+.47	+1.37	.01
	12	20	4.85 (5.08)	.30 (.73)	-.02	-4.55*	-1.61	.02
G	7	13	4.00 (2.83)	5.23 (4.82)	.34	+1.23		
	8	16	7.94 (8.92)	5.00 (3.95)	.61	-2.94		
	10	15	4.47 (4.21)	4.47 (6.83)	.16	.00		
	11	16	5.69 (6.90)	3.25 (6.18)	-.32	-2.44	-1.54	.02
	12	5	.00 (.00)	4.40 (9.29)	.00	+4.40	+7.28*	.31
H	11	39	4.77 (4.52)	3.87 (5.26)	.03	-.90		
	12	33	5.27 (6.14)	2.39 (3.15)	.51	-2.88*		

[a]Standard deviations are in parentheses.
[b]Correlation between pretest and posttest scores.
[c]The mean gain for the project group minus the mean gain for the Weber comparison group.
*Statistically significant at the .05 level.

Table 7

Pretest and posttest means and standard deviations for HOLLT (holistic, "Increased Homework") scores.

School	Grade	N	Pre[a]	Post[a]	r[b]	Change	$\bar{G}_x - \bar{G}_w$[c]	r^2_{pb}
A	11	12	5.42 (1.73)	5.33 (2.10)	.23	-.08	+.29	.00
	12	15	6.47 (1.64)	5.40 (2.03)	.37	-1.07	-.39	.01
B	11	18	6.50 (2.45)	6.33 (2.22)	.72	-.17	+.21	.00
	12	14	8.21 (1.12)	8.79 (1.72)	.31	+.57	+1.25*	.06
C	11	26	7.42 (2.14)	4.85 (2.01)	.28	-2.58*	-2.20*	.17
	12	29	7.55 (2.26)	5.55 (2.03)	.47	-2.00*	-1.32*	.07
D	11	24	6.00 (1.79)	6.54 (2.04)	.52	+.54	+.92	.03
	12	15	5.07 (1.71)	5.93 (1.53)	.65	+.87*	+1.54*	.09
E	11	24	7.21 (2.89)	6.50 (2.23)	.65	-.71	+.33	.00
F	11	23	7.00 (2.00)	6.17 (1.87)	.50	-.83	-.45	.01
	12	20	6.60 (1.46)	5.80 (1.82)	.48	-.80*	-.12	.00
G	7	14	4.29 (1.49)	5.07 (1.77)	.19	+.79		
	8	16	4.00 (1.37)	4.94 (1.48)	.53	+.94*		
	10	15	5.87 (2.64)	5.20 (2.30)	.50	-.67		
	11	16	6.19 (2.01)	4.69 (1.70)	.64	-1.50*	-1.12	.05
	12	6	4.83 (2.23)	3.67 (1.86)	.47	-1.17	-.99	.04
H	11	40	6.17 (2.11)	5.80 (2.22)	.49	-.37		
	12	34	6.85 (2.31)	6.18 (2.79)	.77	-.68*		
I	11	13	4.92 (1.55)	5.77 (1.54)	.45	+.84		
J	11	7	7.71 (1.50)	7.71 (1.38)	.28	.00		
	12	6	7.50 (2.43)	7.50 (2.59)	.72	.00		

[a]Standard deviations are in parentheses.
[b]Correlation between pretest and posttest scores.
[c]The mean gain for the project group minus the mean gain for the Weber comparison group.
*Statistically significant at the .05 level.

Table 8

Pretest and posttest means and standard deviations for HOLIN (holistic, "An Influential Person") scores.

School	Grade	N	Pre[a]	Post[a]	r[b]	Change	$\bar{G}_x - \bar{G}_w$[c]	r^2_{pb}
A	11	12	6.25 (1.81)	5.42 (1.83)	.32	-.83	-.31	.00
	12	15	6.87 (2.10)	7.20 (1.97)	.75	+.33	+1.04	.05
B	11	18	6.50 (1.62)	6.50 (1.72)	.50	.00	+.52	.01
	12	14	8.93 (2.09)	8.64 (1.95)	-.16	-.29	+.42	.00
C	11	26	6.42 (1.58)	5.27 (1.84)	.51	-1.15*	-.63	.02
	12	29	6.86 (2.06)	5.76 (1.50)	.51	-1.10*	-.40	.01
D	11	24	6.21 (2.43)	6.50 (1.50)	.30	+.29	+.82	.03
	12	15	5.93 (1.58)	6.60 (1.80)	.19	+.67	+1.37*	.08
E	11	24	6.50 (2.45)	6.71 (2.31)	.38	+.21	+.73	.02
F	11	22	5.82 (2.15)	5.68 (2.06)	.49	-.14	+.39	.01
	12	20	6.70 (1.69)	5.10 (2.02)	.33	-1.60*	-.89	.04
G	7	14	4.79 (1.25)	4.86 (1.56)	.34	+.07		
	8	16	5.25 (2.27)	5.44 (.96)	.62	+.19		
	10	15	6.93 (2.66)	5.40 (2.35)	.64	-1.53*		
	11	16	5.87 (1.75)	5.12 (1.20)	.48	-.75	-.22	.00
	12	6	3.50 (1.05)	5.83 (3.19)	.93	+2.33*	+3.04*	.30
H	11	40	6.52 (1.97)	6.00 (1.97)	.56	-.52		
	12	34	6.35 (2.45)	5.65 (2.21)	.69	-.71*		

[a]Standard deviations are in parentheses.
[b]Correlation between pretest and posttest scores.
[c]The mean gain for the project group minus the mean gain for the Weber comparison group.
*Statistically significant at the .05 level.

Table 9

Pretest and posttest means and standard deviations for HOLTOT (total holistic, "An Influential Person" plus "Increased Homework") scores.

School	Grade	N	Pre[a]	Post[a]	r[b]	Change	$\bar{G}_x - \bar{G}_w$[c]	r^2_{pb}
A	11	12	11.67 (3.17)	10.75 (3.25)	.57	-.92	-.02	.00
	12	15	13.33 (3.02)	12.60 (3.62)	.75	-.73	+.65	.01
B	11	18	13.00 (3.24)	12.83 (3.42)	.74	-.17	+.73	.01
	12	14	17.14 (2.54)	17.43 (3.27)	.24	+.29	+1.67	.04
C	11	26	13.85 (3.34)	10.11 (3.13)	.53	-3.73*	-2.83*	.10
	12	29	14.41 (3.73)	11.31 (3.02)	.66	-3.10*	-1.72*	.04
D	11	24	12.21 (3.78)	13.04 (2.82)	.73	+.83	+1.73*	.04
	12	15	11.00 (2.45)	12.53 (2.70)	.56	+1.53*	+2.92*	.11
E	11	24	13.71 (4.90)	13.21 (4.09)	.59	-.50	+.40	.00
F	11	22	12.73 (3.59)	11.86 (3.23)	.62	-.86	+.04	.00
	12	20	13.30 (2.41)	10.90 (3.21)	.41	-2.40*	1.02	.01
G	7	14	9.07 (2.06)	9.93 (2.92)	.45	+.86		
	8	16	9.25 (2.95)	10.37 (1.93)	.58	+1.12		
	10	15	12.80 (4.87)	10.60 (4.31)	.69	-2.20*		
	11	16	12.06 (3.13)	9.81 (2.59)	.77	-2.25*	-1.35	.02
	12	6	8.33 (3.14)	9.50 (4.85)	.70	+1.17	+2.55*	.09
H	11	40	12.70 (3.33)	11.80 (3.86)	.66	-.90		
	12	34	13.21 (4.37)	11.82 (4.66)	.86	-1.38*		

[a]Standard deviations are in parentheses.
[b]Correlation between pretest and posttest scores.
[c]The mean gain for the project group minus the mean gain for the Weber comparison group.
*Statistically significant at the .05 level.

Table 10

Pretest and posttest means and standard deviations for SURTOT (Opinions About Writing) scores.

School	Grade	N	Pre[a]	Post[a]	r[b]	Change[c]	$\bar{G}_x - \bar{G}_w$[d]	r^2_{pb}
A	11	12	82.50 (20.33)	72.75 (20.64)	.62	+9.75	+6.17	.03
	12	16	76.62 (28.06)	70.25 (29.80)	.74	+6.37	+5.25	.02
B[e]	11	18		68.30 (13.99)				
	12	14		66.31 (15.10)				
C	11	26	69.65 (14.94)	69.31 (12.83)	.73	+.35	-3.23	.01
	12	29	71.41 (16.12)	68.00 (12.47)	.84	+3.41	+2.30	.00
D	11	24	68.29 (20.63)	63.12 (16.57)	.77	+5.17	+1.59	.00
	12	15	76.60 (21.56)	79.80 (21.35)	.70	-3.20	-4.32	.01
E	11	24	70.71 (21.12)	70.46 (20.52)	.77	+.25	-3.32	.01
F	11	23	68.78 (13.35)	65.61 (12.21)	.53	+3.17	-.40	.00
	12	20	74.25 (18.13)	68.30 (14.43)	.82	+5.95*	+4.83	.02
G	7	14	66.64 (18.37)	67.07 (20.62)	.82	-.43		
	8	16	72.50 (10.53)	72.44 (20.66)	.64	+.06		
	10	15	77.60 (23.09)	77.80 (16.71)	.77	-.20		
	11	16	76.75 (22.69)	77.75 (17.86)	.81	-1.00	-4.57	.01
	12	6	76.67 (28.34)	67.83 (20.89)	.89	+8.83	+7.72	.04
H	11	40	72.57 (15.98)	69.00 (15.52)	.73	+3.57		
	12	34	75.41 (14.55)	74.29 (14.81)	.86	+1.12		

[a]Standard deviations are in parentheses.
[b]Correlation between pretest and posttest scores.
[c]On SURTOT, lower scores indicate more positive attitudes, so a change to a lower mean receives a plus sign.
[d]The mean gain for the project group minus the mean gain for the Weber comparison group.
[e]SURTOT pretests from Spanish Fork High School never reached the statewide evaluator, so the pretest means and standard deviations and the pre-post correlation coefficient are not available.
*Statistically significant at the .05 level.

Table 11

Posttest means and standard deviations for COMPTOT (Opinions About Writing with Computers Survey) scores.

School	Grade	N	Post[a]
A	11	12	15.83 (5.22)
	12	15	18.13 (5.42)
B	11	18	15.72 (6.20)
	12	14	15.79 (5.22)
C	11	26	20.46 (7.29)
	12	29	18.62 (5.75)
D	11	24	20.62 (6.77)
	12	15	22.67 (3.75)
E	11	20	16.20 (4.03)
F	11	23	23.48 (6.96)
	12	20	19.65 (4.36)
G	7	14	15.14 (5.19)
	8	16	16.25 (3.00)
	10	14	19.57 (5.29)
	11	16	20.75 (5.11)
	12	6	26.00 (3.90)
H	11	40	21.40 (5.03)
	12	34	21.94 (4.66)

Note. Only posttest scores were obtained on COMPTOT. Also, on COMPTOT, lower scores indicate more positive attitudes.

Appendix J

Analyses of Adjusted and Unadjusted Posttest Means
(Tables 12 through 19)

Table 12

Analyses of covariance for TOTWD (total WANDAH revisions) scores.

School	Grade	N	Adj. $\bar{X}$	H N	H Adj. $\bar{X}$	Diff.[a]	r^b	F	r^2_{pb}
A	11	12	.42	39	1.49	-1.07	.01	2.13	.02
	12	14	.62	33	.80	-.18	.41	.15	.00
B	11	17	2.16	39	1.51	+.65	.02	.73	.01
	12	14	3.32	33	.97	+2.35	.16	13.36*	.23
C	11	25	.49	37	1.54	-1.02	-.01	3.79	.06
	12	27	3.25	31	.87	+2.38	.20	15.41*	.22
D	11	24	.72	37	1.52	-.80	.04	2.10	.03
	12	15	.61	31	.87	-.26	.37	.32	.01
E	11	22	2.79	37	1.44	+1.35	-.19	4.16*	.07
F	11	20	1.50	37	1.53	-.03	.00	.00	.00
	12	19	.11	31	.95	-.84	.30	+5.18*	.10
G	11	16	.87	37	1.54	-.67	-.03	1.01	.02
	12	5	2.01	33	.85	+1.16	.34	1.60	.04

[a]Difference between adjusted posttest means.
[b]Correlation between pretest and posttest scores with the two groups pooled.
*Statistically significant at the .05 level.

Table 13

Analyses of covariance for TOTNWD (total nonWANDAH revisions) scores.

School	Grade	N	Adj. $\bar{X}$	H N	H Adj. $\bar{X}$	Diff.[a]	r^b	F	r^2_{pb}
A	11	12	.90	39	2.36	-1.46	.07	1.83	.04
	12	14	2.37	33	1.23	+1.14	.44	2.56	.05
B	11	17	5.34	39	2.43	+2.91	.13	8.22*	.10
	12	14	6.61	33	1.65	+4.96	.23	19.11*	.28
C	11	25	1.10	37	2.46	-1.36	.07	2.66	.04
	12	27	4.51	31	1.17	+3.34	.33	23.76*	.28
D	11	24	2.37	37	2.52	-.15	.00	.02	.00
	12	15	2.10	31	1.32	+.78	.40	1.18	.03
E	11	22	5.50	37	2.52	+2.98	.02	7.85*	.11
F	11	20	2.02	37	2.51	-.49	.03	.29	.00
	12	19	.30	31	1.46	-1.16	.47	5.84*	.11
G	11	16	2.47	37	2.48	-.01	-.15	.00	.00
	12	5	3.66	33	1.35	+2.31	.40	3.11	.08

[a]Difference between adjusted posttest means.
[b]Correlation between pretest and posttest scores with the two groups pooled.
*Statistically significant at the .05 level.

Table 14

Analyses of covariance for RVTOT (total revisions, WANDAH plus nonWANDAH) scores.

School	Grade	N	Adj. $\bar{X}$	H N	H Adj. $\bar{X}$	Diff.[a]	r^b	F	r^2_{pb}
A	11	12	1.31	39	3.85	-2.54	.03	2.46	.05
	12	14	2.94	33	2.05	+.89	.43	.81	.02
B	11	17	7.53	39	3.93	+3.60	.06	5.40*	.06
	12	14	9.93	33	2.62	+7.31	.21	22.31*	.31
C	11	25	1.59	37	4.00	-2.41	.04	3.64	.06
	12	27	7.80	31	2.00	+5.80	.33	30.83*	.36
D	11	24	3.12	37	4.03	-.91	.05	.50	.01
	12	15	2.70	31	2.20	+.50	.40	.25	.01
E	11	22	8.19	37	4.02	+4.17	-.06	7.96*	.11
F	11	20	3.50	37	4.05	-.55	.00	.17	.00
	12	19	.39	31	2.41	-2.02	.41	8.14*	.15
G	11	16	3.33	37	4.02	-.69	-.13	.18	.00
	12	5	5.59	33	2.21	+3.38	.35	2.71	.07

[a]Difference between adjusted posttest means.
[b]Correlation between pretest and posttest scores with the two groups pooled.
*Statistically significant at the .05 level.

Table 15

Analyses of covariance for HOLLT (holistic, "Increased Homework") scores.

School	Grade	N	Adj. $\bar{X}$	H N	H Adj. $\bar{X}$	Diff.[a]	r[b]	F	r^2_{pb}
A	11	12	5.61	40	5.71	-.10	.44	.02	.00
	12	15	5.63	34	6.08	-.45	.70	.60	.01
B	11	17	6.11	39	5.87	+.24	.46	.19	.00
	12	14	7.99	33	6.56	1.43	.72	5.77*	.11
C	11	25	4.58	37	5.93	-1.35	.39	6.28*	.09
	12	27	5.31	31	6.59	-1.28	.64	6.15*	.10
D	11	24	6.59	37	5.68	+.91	.45	3.34	.05
	12	15	7.26	31	5.83	+1.43	.74	5.52*	.11
E	11	22	6.17	37	5.88	+.29	.48	.33	.01
F	11	20	5.81	37	5.83	-.02	.48	.00	.00
	12	19	5.86	31	6.26	-.40	.72	.65	.01
G	11	16	4.68	37	5.71	-1.03	.48	3.55	.07
	12	6	5.16	34	5.91	-.75	.74	.80	.02
				I					
B	11	18	5.84	40	6.13	-.29	.55	.41	.01
				J					
	11	18	6.56	20	6.76	-.20	.46	.11	.00
	12	14	8.67	20	7.88	+.79	.71	1.90	.06

[a]Difference between adjusted posttest means.
[b]Correlation between pretest and posttest scores with the two groups pooled.
*Statistically significant at the .05 level.

Table 16

Analyses of covariance for HOLIN (holistic, "An Influential Person") scores.

School	Grade	N	Adj. $\overline{X}$	H N	H Adj. $\overline{X}$	Diff.[a]	r^b	F	r^2_{pb}
A	11	12	5.52	40	5.97	-.45	.51	.63	.01
	12	15	6.97	34	5.75	+1.22	.71	6.55*	.12
B	11	17	6.37	39	5.91	+.46	.45	1.06	.02
	12	14	7.93	33	6.03	1.90	.48	7.68*	.15
C	11	25	5.31	37	5.96	-.65	.50	2.39	.04
	12	27	5.72	31	5.86	-.14	.60	.12	.00
D	11	24	6.54	37	5.91	+.63	.40	2.33	.04
	12	15	6.73	31	5.65	+1.08	.57	3.14	.07
E	11	22	6.83	37	5.95	+.88	.43	3.02	.05
F	11	20	5.78	37	5.81	-.03	.47	.00	.00
	12	19	4.95	31	5.83	-.88	.58	2.78	.06
G	11	16	5.29	37	5.86	-.57	.45	1.58	.03
	12	6	7.50	34	5.35	+2.15	.67	6.20*	.14

[a]Difference between adjusted posttest means.
[b]Correlation between pretest and posttest scores with the two groups pooled.
*Statistically significant at the .05 level.

Table 17

Analyses of covariance for HOLTOT (total holistic, "An Influential Person" plus "Increased Homework") scores.

School	Grade	N	Adj. $\bar{X}$	H N	H Adj. $\bar{X}$	Diff.[a]	r^{b}	F	r^2_{pb}
A	11	12	11.33	40	11.63	-.30	.64	.10	.00
	12	15	12.52	34	11.86	+.66	.84	.78	.02
B	11	17	12.50	39	11.77	+.73	.58	.79	.01
	12	14	15.24	33	12.87	2.37	.77	5.79*	.11
C	11	25	9.70	37	12.02	-2.32	.57	8.88*	.13
	12	27	10.94	31	12.52	-1.58	.77	5.36*	.09
D	11	24	13.19	37	11.54	+1.65	.63	5.56*	.09
	12	15	14.02	31	11.41	+2.61	.81	9.02*	.18
E	11	22	12.90	37	11.88	+1.02	.55	1.34	.02
F	11	20	11.62	37	11.62	.00	.61	.00	.00
	12	19	10.74	31	12.13	-1.39	.79	3.33	.06
G	11	16	10.07	37	11.52	-1.45	.62	3.16	.06
	12	6	13.35	34	11.14	+2.21	.84	3.15	.08

[a]Difference between adjusted posttest means.
[b]Correlation between pretest and posttest scores with the two groups pooled.
*Statistically significant at the .05 level.

Table 18

Analyses of covariance for SURTOT (Opinions About Writing Survey) scores.

School	Grade	N	Adj. $\bar{X}$	H N	H Adj. $\bar{X}$	Diff.[a]	r^{b}	F	r^2_{pb}
A	11	12	67.55	40	70.56	+3.01	.69	.52	.01
	12	16	69.57	34	74.61	+5.04	.78	1.63	.03
B[c]	11	18	76.71	40	69.00	-7.71	___	3.17	.05
	12	14	66.31	34	74.29	+7.98	___	2.79	.06
C	11	25	71.18	37	67.45	-3.73	.74	2.16	.04
	12	27	69.07	31	72.59	+3.52	.87	3.37	.05
D	11	24	64.48	37	67.15	+2.67	.73	.86	.01
	12	15	78.54	31	74.28	+4.26	.80	1.34	.03
E	11	22	69.15	37	67.26	+1.89	.72	.36	.01
F	11	20	66.24	37	67.41	+1.17	.64	.14	.00
	12	19	68.94	31	73.71	+4.77	.86	4.46*	.08
G	11	16	75.33	37	69.07	-6.26	.77	3.77	.07
	12	6	66.98	34	74.44	+7.46	.86	4.35*	.10

[a]Difference between adjusted posttest means. On SURTOT, lower scores indicate more positive attitudes, so the group with the lower mean receives a plus sign.
[b]Correlation between pretest and posttest scores with the two groups pooled.
[c]The Spanish Fork SURTOT pretests never reached the statewide evaluator, so the posttest means are unadjusted and analysis of variance, rather than analysis of covariance, was used to test the differences between means for statistical significance and as the basis for the r^2_{pb}.
*Statistically significant at the .05 level.

Table 19

Analyses of variance for COMPTOT (Opinions About Writing with Computers Survey) scores.

School	Grade	N	$\bar{X}$	H		Diff.[a]	F	r^2_{pb}
				N	$\bar{X}$			
A	11	12	15.83	40	21.40	+5.57	11.11*	.18
	12	15	18.13	34	21.94	+3.81	6.29*	.12
B	11	18	15.90	40	21.40	+5.50	12.65*	.18
	12	14	16.02	34	21.94	+5.92	14.60*	.24
C	11	26	20.46	40	21.40	+.94	.37	.00
	12	29	18.60	34	21.94	+3.34	6.29*	.10
D	11	24	20.62	40	21.40	+.78	.27	.00
	12	15	22.29	34	21.94	-.35	.05	.00
E	11	20	16.25	40	21.40	+5.15	15.29*	.21
F	11	23	23.50	40	21.40	-2.10	1.87	.03
	12	20	19.65	34	21.94	+2.29	3.18	.06
G	11	16	20.75	40	21.40	-.65	.18	.00
	12	6	26.00	34	21.94	-4.06	4.03*	.10

[a]Difference between posttest means. On COMPTOT, lower scores indicate more positive attitudes, so the group with the lower mean receives a plus sign.
*Statistically significant at the .05 level.

Appendix K

Analyses Sent to Third-party Evaluators

UTAH STATE UNIVERSITY · LOGAN, UTAH 84322

COLLEGE OF EDUCATION
TELEPHONE (801)750-1469

BUREAU OF
RESEARCH SERVICES
UMC 28

SAMPLE

June 12, 1986

Dr. Norman F. Hyatt
310 MCKB/BYU
Provo, UT 84602

Dear Norm:

Enclosed are computer printouts for the analysis of data for the WANDAH productivity project at the Spanish Fork High School. As you will recall, it was agreed at our October 2, 1985, WANDAH evaluation meeting in Salt Lake City that I would randomly select a sample of approximately 25% of the students who took the May 1985 writing assessment and who had both pre and post writing assessments available at each WANDAH site. That was done. It has, however, been difficult to maintain that sample due to attrition over the four testings (two pretest and two posttest writing samples). We have replaced students randomly when necessary; but in some cases the sample size has diminished somewhat below the initial sample size and we have not always been able to maintain the female-male balance I sought.

I was to attempt to have scores for each sample to the third party evaluator by June 1, and that listing is enclosed. I have done some analyses of the data as well, and those analyses are enclosed along with a list of the printouts for your data. Also enclosed is a brief description of the dependent measures and a summary of inter-rater agreement and reliability coefficients for the dependent measures. The procedures for holistic and revisions scoring will be described in my state-wide evaluation report, and you may want to note that in your report.

The analyses were run using SPSS-X. Note that the MANOVA program which we used for the analyses of covariance (and you can tell each is an analysis of covariance by the presence of a Regression source of variation in the table, despite the ANALYSIS OF VARIANCE heading) first provides the cell means and standard deviations for the pre- and the posttest dependent measures. Each analysis of covariance and analysis of variance Source of Variation table contains a CONSTANT source of variation. The F-ratio for the constant is used to test whether the regression line passes through the point of origin (actually, whether any deviation from the point of origin is

greater than one would expect by chance). In essence, this is the same as asking whether the mean for all of the scores is significantly different from zero. For our purposes, it is of no interest.

You will also notice in the printouts for the analyses of covariance, two Source of Variation tables. The first one, which begins with a WITHIN CELLS source of variation, is the major one of interest. It contains the tests of significance for the differences among adjusted means. The second table, which starts with a WITHIN+RESIDUAL source of variation, tests for homogeneity of regression lines. The last two items in that table--the dependent measure by SCHOL and by GENDER--are the only items of interest. These tests of significance indicate the probability of obtaining the differences among the sample regression lines under the null hypothesis that the regression lines are homogeneous. You will recall that homogeneity of regression is an assumption underlying the use of analysis of covariance. However, as with the assumptions of normality and homogeneity of variances, analysis of covariance is relatively robust in regard to violation of the assumption of homogeneity of regression. Nevertheless, in cases where the F-ratio indicates statistical significance, caution in interpretation would be prudent. Ignore the adjusted and estimated means provided after each WITHIN+RESIDUAL source of variation table.

Recall, too, that although we randomly selected the samples, students were not randomly assigned to treatment groups. This means that the statistical significance of results must be interpreted in terms of their likelihood had the students been assigned randomly to treatments.

Pre-post mean comparisons were run with the thought that you might be interested in the gains of your WANDAH group irrespective of the comparisons with Weber, which has been used as a comparison group for all sites.

Following each covariance Source of Variation table, you will find the adjusted cell and marginal means. Despite the label "Adjusted and Estimated Means", the means are only adjusted: The design was in general sufficiently balanced so that we did not weight the means for differences in n's. Also, you may note slight discrepancies in n's between analyses. These are due to different SPSS procedures for handling missing data with different analyses. The one-way analyses of covariance will have the most complete n's.

Note, too, that for the COMPTOT dependent measure (Attitudes Toward Writing with the Computer), only an analysis of variance or t-test could be done because pretest scores were not available. That will be evident because there will not be a Regression source of variation, nor will there be a Source of Variation table with a WITHIN+RESIDUAL source of variation.

Probably the only other thing that I need to note, Norm, is a reminder that the pretest for the Opinion of Writing Survey never reached me and could not be located. Consequently, I have only been able to run an analysis of variance on the SURTOT posttest data. Also, you will recall that we had the holistic writing sample for only grade 11 at the Payson High School.

I believe that the printouts are fairly straightforward, and I hope that the information is interpretable. I do know, however, that computer printouts can be baffling; so do not hesitate to call me (750-1469) if you have any questions. I hope to get away for a two- or three-day vacation during the week of June 16. If you call and I am not here, ask for my graduate assistant (Joseph Jesunathadas) who ran the computer analyses for me. He understands the printouts as well as I do, or perhaps better.

Good luck with your report!

Sincerely,

James P. Shaver
Professor and
Associate Dean
for Research

JPS/km

Enclosures

cc: George McCulley

WANDAH EVALUATION

Printouts: Pleasant Grove

Number	Analysis*
1	Pleasant Grove and Weber, Grade 11 1-way ANOVA, COMPTOT
	1-way COVAR
2	Pleasant Grove and Weber, Grade 12 1-way ANOVA
	1-way COVAR
3	Pleasant Grove, Grades 11 and 12 Pre-post means, t-tests (no COMPTOT)

*ANOVA = analysis of variance
COVAR = analysis of covariance

WANDAH EVALUATION

Printouts: Spanish Fork

Number	Analysis*
1	Spanish Fork and Payson, Grade 11 2 (school) X 2 (gender) COVAR, HOLLT
2	Spanish Fork and Springville, Grade 11 2 (school) X 2 (gender) COVAR, HOLLT
3	Spanish Fork and Springville, Grade 12 2 (school) X 2 (gender) COVAR, HOLLT
4	Spanish Fork and Weber, Grade 11 2 X 2 ANOVA, COMPTOT and POSURTOT 2 X 2 COVAR
5	Spanish Fork and Weber, Grade 12 2 X 2 ANOVA, COMPTOT and POSURTOT 2 X 2 COVAR
6	Spanish Fork, Grades 11 and 12 Pre-post means, t-tests (no COMPTOT)
7	Payson, Grade 11; Springville, Grades 11 and 12 Pre-post means, HOLLT, t-tests
8	Spanish Fork and Weber, Grade 11 1-way ANOVA, COMPTOT and POSURTOT 1-way COVAR
9	Spanish Fork and Weber, Grade 12 1-way ANOVA, COMPTOT and POSURTOT 1-way COVAR

*ANOVA = analysis of variance
COVAR = analysis of covariance

WANDAH EVALUATION

Printouts: Mountain Crest

Number	Analysis*
1	Mountain Crest and Weber, Grade 11 2 (school) X 2 (gender) ANOVA, COMPTOT means
	2 X 2 COVAR
2	Mountain Crest and Weber, Grade 12 2 (school) X 2 (gender) ANOVA, COMPTOT means
	2 X 2 COVAR
3	Mountain Crest, Grades 11 and 12 Pre-post means, t-tests (no COMPTOT)
4	Mountain Crest and Weber, Grade 11 1-way ANOVA, COMPTOT
	1-way COVAR
5	Mountain Crest and Weber, Grade 12 1-way ANOVA, COMPTOT
	1-way COVAR

*ANOVA = analysis of variance
COVAR = analysis of covariance

WANDAH EVALUATION

Printouts: Logan

Number	Analysis*
1	Logan and Weber, Grade 11 2 (school) X 2 (gender) ANOVA, COMPTOT means
	2 X 2 COVAR
2	Logan, Grade 11 Pre-post means, t-tests (no COMPTOT)
3	Logan and Weber, Grade 11 1-way ANOVA, COMPTOT
	1-way COVAR

*ANOVA = analysis of variance
COVAR = analysis of covariance

WANDAH EVALUATION

Printouts: Park City

Number	Analysis*
1	Park City and Weber, Grade 11 2 (school) X 2 (gender) ANOVA, COMPTOT means 2 X 2 COVAR
2	Park City and Weber, Grade 12 2 (school) X 2 (gender) ANOVA, COMPTOT means 2 X 2 COVAR
3	Park City, Grades 11 and 12 Pre-post means, t-tests (no COMPTOT)
4	Park City and Weber, Grade 11 1-way ANOVA, COMPTOT means 1-way COVAR
5	Park City and Weber, Grade 12 1-way ANOVA, COMPTOT means 1-way COVAR

*ANOVA = analysis of variance
COVAR = analysis of covariance

WANDAH EVALUATION

Printouts: North Summit

Number	Analysis*
1	North Summit, Grades 7, 8, and 10 pre-post means, t-tests (no COMPTOT)
2	North Summit and Weber, Grade 11 2 (school) X 2 (gender) ANOVA, COMPTOT means
3	North Summit and Weber, Grade 11 2 X 2 COVAR
4	North Summit and Weber, Grade 12 1-way ANOVA, COMPTOT means
	1-way COVAR
5	North Summit, Grades 11 and 12 pre-post means, t-tests (no COMPTOT)
6	North Summit and Weber, Grade 11 1-way ANOVA, COMPTOT means
	1-way COVAR

*ANOVA = analysis of variance
COVAR = analysis of covariance