In 1990, a study was conducted at Rio Hondo College (Whittier, California) to determine if readers exhibited any bias in scoring test papers that were composed on a word processor as opposed to being written by hand. The study began with the formulation of tentative pilot study questions and the development of procedures to address them. Three areas of inquiry were devised: whether reader bias skewed the scores on word-processed papers; what factors contributed to reader bias; and what factors contributed to students’ choices to use or not to use the word processors when they took their placement and final examinations. For the first question, 300 randomly selected, previously scored, handwritten placement essays were converted to word-processed papers, including all errors in language and surface conventions. For the other two questions, interviews and discussions were conducted. Study findings included the following: (1) papers converted to word-processed versions received lower scores than in their original handwritten state, and half of the examination readers indicated a preference for reading handwritten papers; (2) readers appeared to have higher expectations of word-processed papers; (3) the Reader Empathy Assessment Discrepancy (R-E-A-D) effect was afforded to handwritten papers, but not to word-processed papers; (4) students who produced handwritten papers reported that they felt uncomfortable about their typing skills, their amount of computer practice, and/or the technology itself; (5) students who produced word-processed papers reported that they did so because corrections were easier to make and they thought the papers would look better; and (6) factors influencing reader bias included perceived paper length and word count, ease of reading, and surface correctness. The document includes a series of recommendations, questions for further study, and 19 references. Appendixes provide the survey instruments and exam questions. (JMC)
DO STUDENTS GET HIGHER SCORES
ON THEIR
WORD-PROCESSED PAPERS?

A Study of Bias in Scoring
Hand-Written vs. Word-Processed Papers

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July, 1990
Rio Hondo College, Whittier, California
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Rio Hondo College, Whittier, CA 90608
In the film "Mississippi Burning," the FBI Chief Investigator says, "This can of worms only opens from the inside."

**WRITING ASSESSMENT at RIO HONDO COLLEGE**

Rio Hondo College is a mid-sized, suburban community college in the Los Angeles area. About half of our 13,000 students attend college at night, only about 25% are full-time students, and most are working at least one job in order to attend college. They are 73% minority (primarily Latino) and 27% Anglo. We have about 200 full-time faculty and around 400 part-time faculty (35 full-time faculty in the Communications Department).

**Direct-Writing Assessment**

The goals of our assessment program are two-fold:

1) To increase the success of students through their accurate placement in composition courses, and

2) To increase student writing skills.

In the last ten years, the composition faculty have used direct-writing assessment for the composition placement test and the exit test for remedial classes (known as the common final). We use a 6-point scale for scoring papers written from prompts that include examples that student writers may or may not use. Each paper is read twice; where scores differ, the paper is read a third time. Students are placed on the basis of a 30-minute essay; the common final is a 75-minute essay. Our composition courses and their cut-off scores are:

<table>
<thead>
<tr>
<th>Course</th>
<th>Cut-off Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>College-Level English</td>
<td>10-12</td>
</tr>
<tr>
<td>One Level Below</td>
<td>8 &amp; 9</td>
</tr>
<tr>
<td>Two Levels Below</td>
<td>7 and below</td>
</tr>
</tbody>
</table>

Rio Hondo College, Whittier, CA 90608
We adhere to the tight-ship method of holistic scoring as developed at ETS, and over time we get consistent scoring, especially with experienced readers. At any given reading of about 15 faculty, only 2-3 readers will be new to the process; their scores are checked repeatedly by the table leaders. In order to increase fairness, the instructor may override the student's common final score if he or she finds the paper atypical of the student's performance during the semester. In the ten years we have used this process, fewer than 3% have required an override. In a like manner, students may contest their pre-enrollment placement score and request a re-reading. Few changes in placement scores have been necessary with one curious exception. One of us requires that her students take the common final on the word processor, and for three semesters she has changed about 60% of 108 students' scores which she believes are initially read about one point low.

Enter the Word Processor

In 1987, we began using computers extensively in our writing program at both the remedial and freshman composition levels. Presently, all remedial writers take a required, 2-hour-per-week computer workshop, using Word Perfect 5.1 in an individual lab environment. Some lecture sections are also offered in a computer classroom, adding an extra 3 hours per week to the student's computer time. Total exposure to the computer is, therefore, uneven, though each student has ample opportunity for additional computer use during open lab hours. Each of us on the project team has found exciting changes in our students' composing processes on the word processor, and we were rather pleased when the students themselves wanted to use the computers on the common final. About 25% now take the common final on the word processor.

PURPOSES, INTERESTS and SUSPICIONS

The Purposes of the Study

* To pilot preliminary ways of studying our direct-writing assessment program.
* To investigate the possible inequities in the holistic scoring of word-processed papers.

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During the last two years, we have begun to notice that our word-processed common finals seem to receive higher scores. We wondered if we had become too enamored of the easily-read papers that spewed forth from our printers. Perhaps, we suspected, our colleagues had gone soft or our students had cracked the code. Clearly, word-processed papers have received higher scores in the last 3 semesters, as they have for the last three years as Table 3 shows, below.

<table>
<thead>
<tr>
<th></th>
<th>Hand Written</th>
<th>Word Processed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summer '89</strong></td>
<td>X = 9.01</td>
<td>X = 9.38</td>
</tr>
<tr>
<td></td>
<td>(N=66)</td>
<td>(N= 34)</td>
</tr>
<tr>
<td><strong>Fall '89</strong></td>
<td>X = 9.16</td>
<td>X = 9.33</td>
</tr>
<tr>
<td></td>
<td>(N=352)</td>
<td>(N=141)</td>
</tr>
<tr>
<td><strong>Spring '90</strong></td>
<td>X = 8.75</td>
<td>X = 9.02</td>
</tr>
<tr>
<td></td>
<td>(N=377)</td>
<td>(N= 64)</td>
</tr>
</tbody>
</table>

Looking at these data, we wondered about possible reader bias in the scoring of word-processed papers. If a bias existed, we needed to know why. Was it that students who used the word processor benefitted from the increased revision capabilities of the computer to produce better organized, more error-free text? Or was it that readers favored the word processed papers? This bias might stem from the fact that these papers are easier and faster to score and appear more polished. Did more confident writers chose the word-processing mode? We needed to ask students directly the influences on their choice.

Our major concern was fairness to students. The common final, as an exit test, affects the student's progress to the next composition level. An inappropriately low score could cost a student another semester in a remedial class. Even worse, a student with an inappropriately high score could fail the subsequent composition course. Further, our commitment to on-going faculty training compelled us to study phenomena that could affect our scoring process.

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We wanted to expand its reliability to include the increasing numbers of word processed papers. We needed to ask our readers about their experience of reading both types of papers.

Our procedures for this pilot necessarily limited our findings. For this pilot, we studied the reading of placement essays and common final essays: the first at the point of entry to the course and the second at the point of exit. We realized that converting the hand-written placement tests to word processed papers was less than ideal; this process was not comparable to the common final. The placement papers were converted from the hand-written originals--surface warts and all--without the kind of easy editing done on computers. The common final, on the other hand, follows an 18-week semester of writing and students who used the word processor could use the spell checker. Thus, they reduced one of many forms of surface errors that offend most English teachers. After a whole semester on the computers, student writers were more likely to catch their surface errors and correct them. Further, during the semester course, students take a midterm which uses writing prompts similar to what they can expect on the final. (See the prompt for each test in the Appendices.)

Early in this pilot (with due respect to Mina Shaughnessy) we found errors in our expectations. The original title of this study was irreverently based upon our hypothesis: "To Compose By Hand is Human; to Compose By Computer is Divine." The findings, however, were perplexing and sometimes contradictory to our title. We have discovered, as is common in such studies, that we have unearthed more questions than answers and identified areas for further study in our changing composition program.
QUESTIONS, PROCEDURES, FINDINGS

We began by formulating tentative pilot study questions and devising procedures to address them. The findings, as summarized below, both confirmed our suspicions and, paradoxically, contradicted them.

Question 1:

On holistically scored papers, does reader bias skew the scores on word processed papers?

Procedures:

Convert 300 randomly-selected, previously scored, hand-written placement essays to word-processed papers, including all errors in language and surface conventions.

Conduct a blind reading of the converted papers.

Survey the common final readers to find out which type of paper they prefer to read.

Finding:

Reader bias may have skewed the scores on word-processed papers. The papers converted to word-processed versions received lower scores than in their original hand-written state, and half of the common final readers indicated a preference for reading hand-written papers.
Question 2:
What factors contribute to reader bias?

Procedures:
Conduct a follow-up discussion among readers of the converted placement essays.

Mix in the word-processed papers with hand-written papers at the common final scoring session (contrary to past practice).

Survey the readers immediately after the common final scoring to compare their attitudes about scoring each type of paper.

Conduct a follow-up discussion among readers of the common final about the differences between reading word-processed papers and reading hand-written papers.

Findings:

- Readers preferred scoring the hand-written papers, even though they were harder to read.

- Readers appeared to have higher expectations of word-processed papers.

- The R-E-A-D effect--Reader Empathy Assessment Discrepancy--was afforded to hand-written papers, but not to word-processed papers.
Question 3:
What factors contribute to students' choices to use or not to use the word-processors when they took the common final?

Procedures:
Survey writers of hand-written papers about why they chose NOT to use the word processors on the common final, Spring Semester, 1990.

Survey writers of word-processed papers about why they CHOSE the word processors on the common final, Spring Semester, 1990.

Findings:

Students who produced hand-written papers reported that they felt uncomfortable about their typing skills, their amount of computer practice, the technology itself, and any combination of factors which might reduce their scores--especially under testing conditions.

Students who produced word-processed papers reported that they chose to use the computers because corrections (including spell-checking) were easier to make and they thought the papers would look better.

QUESTION 1: Reader Scoring Bias
We read the converted placement essays and found that, under these conditions at least, word-processed papers received lower scores. Two T-tests were run. The first was run on the means of the two groups of papers (hand written and word processed) as a whole. The second was run on the papers in matched pairs, the original and its word-processed version. Both of these tests reached the level of significance beyond .001 (see Table 2, next page).
Table 2
SCORES COMPARISON
Originals and Word-Processed Versions

<table>
<thead>
<tr>
<th>Hand-Written Originals</th>
<th>Word-Processed Versions</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X = 8.1$</td>
<td>$X = 7.7$</td>
<td>297</td>
</tr>
</tbody>
</table>

Factors Influencing Reader Bias

Perceived Paper Length and Word Count

Because word-processed papers looked shorter than most hand-written papers, we ran two comparisons for perceived length, and one for actual word count. We compared perceived length on the original hand-written papers with perceived length of their word-processed versions. Then we compared these sets by actual word count. To do this we first batched the hand-written papers according to visually-perceived length: short (half a page or less); medium (one page); long (more than one page). These data appear below in Table 3.

Table 3
COMPARISON OF SCORES BY PERCEIVED LENGTH
Sorted by Original Hand-Written Length

<table>
<thead>
<tr>
<th>Hand-Written</th>
<th>Word-Processed</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short</td>
<td>$X = 7.1$</td>
<td>$X = 6.8$</td>
</tr>
<tr>
<td>Medium</td>
<td>$X = 7.8$</td>
<td>$X = 7.2$</td>
</tr>
<tr>
<td>Long</td>
<td>$X = 8.0$</td>
<td>$X = 8.0$</td>
</tr>
</tbody>
</table>

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Next, we re-batched the word-processed versions by the same visual categories used for the hand-written papers, this time using the word-processed papers as the basis for perceived length. The short and medium-length hand-written papers were scored higher than their word-processed version. The group of long word-processed papers were scored higher; this is the only instance when the word-processed papers were scored higher (see Table 4).

<table>
<thead>
<tr>
<th>Table 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPARISON OF SCORES BY PERCEIVED LENGTH</td>
</tr>
<tr>
<td>Compared by Word-Processed Length</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Word-Processed</th>
<th>Hand-Written</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short</td>
<td>(X = 7.1)</td>
<td>(X = 7.4)</td>
<td>94</td>
</tr>
<tr>
<td>Medium</td>
<td>(X = 8.1)</td>
<td>(X = 8.9)</td>
<td>160</td>
</tr>
<tr>
<td>Long</td>
<td>(X = 8.9)</td>
<td>(X = 8.7)</td>
<td>41</td>
</tr>
</tbody>
</table>

We re-defined length as word count, divided the sample into three equal groups, and compared word count to score means. (Hereafter, WP indicates word-processed and HW indicates hand-written. See Table 5, below.)

<table>
<thead>
<tr>
<th>Table 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPARISON OF SCORES BY ACTUAL WORD COUNT</td>
</tr>
<tr>
<td>Word-count Groups By Score Means</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Word Count</th>
<th>WP Score</th>
<th>HW Score</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short</td>
<td>135</td>
<td>6.9</td>
<td>7.6</td>
<td>99</td>
</tr>
<tr>
<td>Med.</td>
<td>210</td>
<td>7.7</td>
<td>8.2</td>
<td>99</td>
</tr>
<tr>
<td>Long</td>
<td>317</td>
<td>8.7</td>
<td>8.7</td>
<td>99</td>
</tr>
</tbody>
</table>
Finally, we checked the word count of the word-processed papers by batching the papers by score groups which correspond to the composition cut-off scores: 10 and above, 8 and 9, and 7's and below. Apparently, on these papers, readers consistently gave higher scores to longer papers, in Table 6, below.

<table>
<thead>
<tr>
<th>Score</th>
<th>Hand-written Originals (HW)</th>
<th>Word-processed Versions (WP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 and above</td>
<td>$\bar{x} = 272$ (N= 64)</td>
<td>$\bar{x} = 254$ (N= 59)</td>
</tr>
<tr>
<td>8 and 9</td>
<td>$\bar{x} = 211$ (N=152)</td>
<td>$\bar{x} = 198$ (N=135)</td>
</tr>
<tr>
<td>7 and below</td>
<td>$\bar{x} = 193$ (N= 81)</td>
<td>$\bar{x} = 187$ (N=112)</td>
</tr>
</tbody>
</table>

**Ease of Reading**

We decided to see how legibility affected scores. We batched papers into Easy, Medium, and Hard to Read. Again, the data in Table 7, below, show that the hand-written papers received higher scores than the word-processed papers.

<table>
<thead>
<tr>
<th>Ease of Reading</th>
<th>Hand-written</th>
<th>Word-processed</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy</td>
<td>$\bar{x} = 8.4$</td>
<td>$\bar{x} = 8.2$</td>
<td>132</td>
</tr>
<tr>
<td>Medium</td>
<td>$\bar{x} = 8.2$</td>
<td>$\bar{x} = 7.5$</td>
<td>87</td>
</tr>
<tr>
<td>Hard</td>
<td>$\bar{x} = 7.8$</td>
<td>$\bar{x} = 7.4$</td>
<td>77</td>
</tr>
</tbody>
</table>

Rio Hondo College, Whittier, CA 90608
QUESTION 2: Faculty Perceptions of Reader Bias

FACULTY COMMENTS: PAPERS CONVERTED TO WORD PROCESSOR
Reading Session Follow-up

The room leader asked the readers, "How did reading these papers differ from the usual scoring session for hand-written placement papers?" We heard the following responses.

"I found these papers so much easier to read than that awful hand writing."

"I try to remember that I'm reading a rough draft, because I lose track of the student's voice when I see printed text."

"Gosh, they look really short--half the page is blank on some of them."

"It's easy to see spelling errors--these students really didn't proof-read carefully at all."

"These were so much faster to read; I didn't get tired so quickly."

After the common final scoring session, we asked readers to fill out the following survey. (The survey form appears in the Appendices.)
COMMON FINAL READERS' SURVEY

1. Which of the two modes would you prefer to read holistically (hand writing or computers)? 10 HW; 3 WP; 7 No Preference

2. Do the word processed papers seem shorter than the hand written papers? 8 Yes 12 No

3. Do you believe that we need clearer criteria that apply to the word processed papers? 3 Yes 15 No

4. When you have difficulty reading students' hand writing, do you give them the benefit of the doubt? 13 Yes 6 No 1 Sometimes

5. Do you make a distinction between typos and misspellings? 13 Yes 7 No

6. Do you think the students who use word processors get better scores on their writing? Why or why not?
   4 Yes 9 No 7 Not sure

Written comments, responding to #6, above, include:
- "No, because we seem to be more forgiving of hand writing."
- "No, we have higher expectations for word processed papers."
- "No, the errors are more clearly defined."
- "No. I think expectations are higher when grading a typed paper, but when the content does not measure up to the visual expectation, the irritation or disappointment level is higher and errors are easier to see."
- "Typos increase the rate of error because they are added to language error; hence, a word processor can be a disadvantage, even though papers look better. I think the advantages and disadvantages cancel each other out."
- "Not necessarily. Computer work makes the job of grading easier on us, but they also make students' errors in spelling, grammar, etc., more obvious! An even trade-off, I think."
- "Yes. I feel instructors are in a better frame of mind when they're looking at something they can read."

Rio Hondo College, Whittier, CA 90608
After the scoring session for the common final, the same room leader asked the group, "How did mixing in the word-processed papers change your reading?"

"I felt warmer toward hand-written papers."

"On hand-written papers, I filled in for students."

"I could see the errors more readily on the word processed papers."

"I like the break that the word processed papers afford us."

"Mixing the hand written papers with the word processed papers helped me stay on our criteria better."

"I mentally switch each paper to the other mode because I distrust my evaluation. When I worked at the state college, we favored the typed or revised word processed papers."

"We were too easy on the word processed papers."

Factors in Reader Bias

Surface Correctness

The comments of the readers at both scoring sessions' discussions and the survey results suggest that the printed text makes surface errors all the more visible than they appear in hand writing. This factor is compounded when readers expect a finished product in word-processed text; readers may too easily forget that they are reading rough drafts, written under pressure.

In search for similar studies, we contacted Mary Fowles at the Educational Testing Service, in Princeton. She conducted an informal study in the spring of 1990, to examine the same phenomenon, under different circumstances. Her
group of readers, experienced in holistic scoring, read 200 essays written as part of the National Teacher's Examination, each about 2 pages long. For this scoring, she mixed the word processed and handwritten essays.

Her readers, too, had higher expectations for the word-processed essays than they did for the hand-written ones. Readers found that their knowledge of the computer's editing, revision, and mechanical capabilities translated into higher expectations for the final products of computers. For example, they found that spelling errors "jumped off the page," that capitalization errors were more obvious, and that uncorrected typos dominated their attention.

Perceived Structure and Length

In our study as in Fowles', organization also proved to be a major visual hinderance to achieving equity in scoring. For example, paragraph indentations in word-processed papers are readily discernable and they suggest that students have organized their discourse along traditional lines. In hand-written papers, indentations are not always as easily discerned. Particularly, papers written in large hand-writing present ambiguity for the readers. In addition, organization may have been assessed at a glance, and readers reacted negatively to large-page-long blocks of text.

The R-E-A-D Effect

For hand-written papers, readers exhibited what we came to call the R-E-A-D effect (Reader Empathy Assessment Discrepancy!). Readers reported that they felt "closer to the writer" when reading hand-written papers. Their empathy, in part, allowed for a closer identification with the writer's individual voice as a strong and important aspect of the essay. No one suggested that such an empathy existed with the word processed papers.

In the handwritten essays, readers treated surface errors differently. Here the writers were, in many cases, given the "benefit of the doubt." If a word or letter was unreadable, readers inserted the correct spelling in their mental transformation of text. In this case, readers may have been more likely to fill in the gaps in hand-
written papers rather than in word-processed papers. We wondered if readers expected the smooth sailing of published, printed text, fully edited and polished, as soon as they saw any form of print. Our readers are used to hard-to-read papers from basic writers; anything barely legible including easily-read printed papers, may automatically foster inappropriately high expectations. Again, this information parallels Fowles' findings at ETS.

**QUESTION 3: Students' Preferences**

Students chose hand-writing over word processing on the common final at a ration of almost 3 to 1. This ratio parallels previous semesters since we introduced word processors into the composition program. We gave the students a survey when they took the common final, and their responses appear below. Their reasons for choosing or not choosing the word-processors appear in rank order. (See the survey forms in the Appendices.)

**STUDENTS: COMMON FINAL HAND WRITER RESPONSE**

(N = 258)

1. Did your composition class (not your workshop) take place in a computer classroom? ____ (Yes - 28 or No - 230)

2. During your writing workshop, did you use a computer most of the time? ____ (Yes - 148 or No - 109)

Please check AS MANY of the following sentences that apply to you:

I did not take the final on the computers because: (RANK ORDERED HERE)

3. **171** I don't type fast enough.

4. **146** I didn't sign up to take the final on the computers.

8. **103** I didn't get enough practice using the computer.
11. I didn't think I would get as high a score using the computer.

10. I would never risk taking a TEST on the computer.

7. I was afraid I would make a mistake and lose my paper.

6. I was afraid the computer or the printer wouldn't work.

5. I wasn't sure where to go to take the final.

9. My instructor advised me not to take the final on the computer.

12. Other reasons for taking the common final in hand writing include:

I get nervous every time I get in front of a computer, I don't know how to work it.

I feel more comfortable writing my essay on paper because I seem to express myself better smoother and faster than on a computer.

I didn't want to. I'd rather write my essay because I feel more in control of what am trying to state.

I like to write out my answers before I use a computer.

Can't concentrate well using a computer.

When I stare at the screen, I sometimes lose my train of thought.

I would have liked to use the computer it lets you put your thoughts down faster, but I have acrylic nails and I didn't want to risk my score.

Computer room too noisy; it makes me nervous.

I wish I could take the test on computer because I write very sloppy, but I don't type fast enough and I didn't get enough practice.

I really wanted to express myself in pen.

Better view of my paper and I feel comfortable printing on paper.

There weren't enough computers.
STUDENTS: COMMON FINAL COMPUTER WRITER RESPONSE

(N = 89)

1. Did your composition class (not your workshop) take place in a computer classroom? ____ (Yes - 32 or No - 57)

2. During your Writing Workshop, did you use a computer most of the time? ____ (Yes - 87 or No - 2)

Please check AS MANY of the following sentences that apply to you:

I took the final on the computers because: (RANK ORDERED HERE)

10. 64. It’s easier to make changes and corrections more easily on the computer.

5. 75. I thought my paper would look better.

7. 63. I could use the spell checker on the computer.

6. 49. I think I have bad hand writing.

8. 43. My instructor encouraged or required me to take the final on the computer.

11. 43. I think I could get a higher score using the computer.

3. 41. I’m a good typist.

9. 41. My instructor encouraged or required me to turn in most of my papers on the computer.

4. 32. I have access to a computer at home or at work.

12. Other reasons include:

The Computers are easier to do assignments on.

It is very easy to proof read on the computer.

It’s easier to write what I have in my mind on computer rather than on paper.

I think it’s faster. Access to the thesaurus.

Rio Hondo College, Whittier, CA 90608
Student Choice on the Final

Students Who Chose NOT to Use the Word Processors

Importantly, of those students who used hand-writing on the final, only 11% of them took composition in a computer-equipped classroom. And yet, 57% of these students indicated that they used the computer most of the time in the workshop.

Otherwise, they chose to write the final in hand-writing due to their fears about the machinery itself under the pressure of testing conditions. Last fall, we had a rise in writer discouragement with the word processing approach when we were attacked by a killer virus in over 200 computers across the campus. A virus control file was added to the main menu, requiring students to check their disks before using the machine. This epidemic may have generated a fear of machinery that we had not encountered before. Many of the students who chose hand-writing, however, were regular users of the word processors, but found the testing situation too brief and too daunting to risk computer use.

Further, students may believe that using the word processor is fundamentally different from "real" writing. Many students do not take advantage of Wordperfect's features that check spelling, block and move text, and provide a huge on-screen thesaurus. Perhaps faculty have not emphasized these computer benefits for composing appropriately. We may have attempted to use the composing process for pen and paper without adapting it to the unique features of word processing.

Students Who Chose to Used the Computer

Of these students, 36% of them were enrolled in a class that met in a computer-equipped classroom (as opposed to 11% of those who chose NOT to use the computer). Further, 98% of the students who used the word processor on the final used the computers in the workshop most of the time (as opposed to 57% of the hand writers).

The students who chose to write the final on the word processor did so primarily because they could make changes and corrections, including spelling,
more easily. Nearly all of them believed that their papers would look better, and over half of them selected bad hand writing as another reason for their choice. Interestingly, students’ expectations of the word-processing advantages matched the readers’ expectations of papers written on the word processor. If readers’ expectations were not biased in the ways they reported, students would have an even greater advantage by using the word processors for the final.

IMPLICATIONS AND RECOMMENDATIONS

Assessment and Teaching

1. Faculty need to know that a reader bias exists against the word-processed papers so that scoring equity can be achieved.

2. If composition programs use computers and include holistic scoring for direct writing assessment, the readers may need more rigorous training to reduce bias against the word processing mode.

3. We need to return to focus on fluency and syntactic maturity, rather than length and surface errors, in holistic reading.

4. If readers’ expectations of word-processed papers were NOT biased, as they reported in this study, students who use the word processor would have an even greater advantage on the common final.

5. If students do not get sufficient amounts of instructional time on the computers, they are less likely to choose the computers as their mode of writing the common final.

6. If faculty discomfort with the computers is communicated to students in the classroom or workshop, students are likely to avoid using them in high-risk testing situations.

Rio Hondo College, Whittier, CA 90608
Equipment and Facilities:
1. Students' fears of computers suggest that we need to keep our software and hardware orientation as simple as possible in language and approach.

2. In order to counter student apprehensions, the hardware must be user-friendly, well maintained, and virus-free.

3. The more access to computers students have, the more likely they are to take the final on the computers. This finding has planning implications.

QUESTIONS FOR FURTHER STUDY
1. How much are students penalized by choosing the word processing mode in testing situations? We may need to convert the word processed papers to the hand-written mode in order to reverse the blind scoring process.

2. Using the students' placement scores as a baseline, is there a difference in skills growth between students who write word-processed and hand-written papers on the common final?

3. How does number of hours per week in a computer-equipped classroom affect the skills growth of remedial students?

4. Is there a difference in writing performance, as measured by portfolio assessment, in college-level composition courses between students who chose the word processor and students who chose hand writing for the common final?

5. To what extent is previous computer use in high school or current use in the workplace a factor in student choice to use word processing on the common final?
QUESTIONS FOR FURTHER ACTION

1. Do we need more extensive training of faculty in the use of the computers and word processing for composition?

2. Do we need to upgrade holistic scoring training to reduce error counting and to focus on fluency and content?

3. Do we need to reduce error counting and to increase focus on fluency and content in the teaching of composition?

4. How can the findings of this study benefit ESL students? Do we need to reduce error counting with ESL students as well? (Some surface errors in writing will stay with ESL students, just as "accents" do in speaking.)

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REFERENCES


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Yamada, Agnes (1990, May 24), [Personal Interview].
APPENDICES:

Placement Test Essay Prompt
Common Final Essay Prompt
Holistic Scoring Criteria: Faculty Edition
Common Final Readers' Survey
Computer Writers' Survey
Hand Writers' Survey
ENGLISH PLACEMENT TEST

Test 

Date 

Permanent File # or SS# 

Directions: You will have 30 minutes to plan and write your essay. Before you begin, you might take five minutes to think about the topic below and make brief notes on the back of this page. For the remaining time allowed, write the essay as carefully and completely as you can. Do not re-copy. Make corrections right on your essay.

WRITE ON THE TOPIC; DO NOT CHOOSE A DIFFERENT TOPIC.

Topic: Now and then we find something irritates us, and we have to find a solution to this problem. For example, crawling along a crowded freeway during rush hour may be irritating, but one solution might be to use the time to plan an event, or listen to tapes on learning French. Or, you might have a fellow student whose behavior is very irritating, and one solution might be to ask your teacher for suggestions to deal with him or her.

Using details and examples:

1. Choose one situation or person that you find an irritation and describe it as thoroughly as possible.

2. Present a specific, possible solution for dealing with the irritation.

OFFICE USE ONLY

<table>
<thead>
<tr>
<th>READER NUMBER</th>
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ESL? LD? TOTAL

28
DIRECTIONS: You will have 75 minutes to plan and write your essay. Before you begin, you should take ten minutes to make brief notes on the back of this page. For the remaining time, write the essay as completely as you can. Do NOT re-copy; make corrections right on your essay. YOU MAY LEAVE ONLY AT THE END OF THE FIRST HOUR OR AT THE END OF THE 75 MINUTES; LEAVING THE TESTING AREA DISTRACTS OTHERS. WRITE ONLY ON THE TOPIC BELOW.

Topic: Rio Hondo College has a new president. Imagine that he is going to conduct a student survey to find out what changes could be made to improve the college. He wants to know about registration; course offerings; the physical facilities such as buildings, parking, and landscaping; counseling and advisement; support services including student activities, job placement, tutoring, health care; and anything else that affects students. You have been selected to participate.

(1) Choose one area that needs change and explain why it is a problem. Be sure to include specific details. Don't focus on a specific person; focus on a specific problem.

(2) Suggest two or three things that might be done to solve the problem. Again, use detail and explain why your solutions will work.
HOLISTIC SCORING CRITERIA: FACULTY EDITION

A "6" paper will be well developed, well organized, and carefully detailed. Although it may have occasional errors common to first drafts, it will address both parts of the question and will open and close with appropriate remarks.

A "5" will usually be less complete and less detailed than a "6", and may not develop both parts of the question evenly. A "5" will demonstrate enough conventional fluency of syntax, grammar, and mechanics to be "ready" for Freshman English.

A "4" will have patterns of mechanical and grammatical errors. Content is often rather general. Evaluators may feel that the writer could use a semester of writing practice before tackling the college-level course.

A "3" will have serious patterns of errors in grammar and mechanics. Content is often weak, poorly developed, and lacking in detail. Frequently the "3" wanders away from the topic.

A "2" or "1" has very limited development, may appear to misunderstand the question, and may have serious first-language interference.

NOTES:
ESL or LD: Evaluators should check the box on the cover sheet for LD (learning disabled) or ESL (English as a Second Language) if the paper warrants a review by department specialists. Many native bi-lingual speakers use code switching that sound somewhat like a non-native speaker; however, ESL students include few American idioms. If the box is checked, the student will be asked to discuss his or her options with the ESL or LD specialist.

WORD PROCESSING vs. HANDWRITING: Students using the word processor may not use the program’s spelling checker, but they may use a dictionary. The Correction of text for computer users, however, is so fast and simple that errors should not be read as typos. Some students may insert hand-written corrections on the printout if they find proof reading easier on "hard copy" than on the screen. The time for writing (and printing) is the same for word processing as it is for hand writing.

ALL PAPERS ARE READ AS "FIRST DRAFTS WRITTEN UNDER PRESSURE."
Rio Hondo College

COMMON FINAL READERS:

1. Which of the two modes would you prefer to read holistically (hand writing or computers)?

Why?

2. Do the word processed papers seem shorter than the hand written papers?  
(Yes or No)

3. Do you believe that we need clearer criteria that apply to the word processor papers?  
(Yes or No)

4. When you have difficulty reading students' hand writing, do you give them the benefit of the doubt?  
(Yes or No)

How do you decide?

5. Do you make a distinction between typos and misspellings?  
(Yes or No)

6. Do you think the students who use word processors get better scores on their writing? Why or why not?

6-11-90
Rio Hondo College

COMPUTER WRITERS SURVEY:

1. Did your composition class (not your workshop) take place in a computer classroom? _____ (Yes or No)

2. During your writing workshop, did you use a computer most of the time? _____ (Yes or No)

Please check AS MANY of the following sentences that apply to you:

I TOOK THE FINAL ON THE COMPUTERS BECAUSE:

3. ____ I'm a good typist.

4. ____ I have access to a computer at home or at work.

5. ____ I thought my paper would look better.

6. ____ I think I have bad handwriting.

7. ____ I could use the spell checker on the computer.

8. ____ My instructor encouraged or required me to take the final on the computer.

9. ____ My instructor encouraged or required me to turn in most of my papers on the computer.

10. ____ It's easier to make changes and corrections more easily on the computer.

11. ____ I think I could get a higher score using the computer.

12. OTHER REASONS INCLUDE:

__________________________________________________________________________

__________________________________________________________________________

6-90
HAND WRITERS SURVEY:

1. Did your composition class (not your workshop) take place in a computers classroom? ____ (Yes or No)

2. During your writing workshop, did you use a computer most of the time? ____ (Yes or No)

Please check AS MANY of the following sentences that apply to you:

I DID NOT TAKE THE FINAL ON THE COMPUTERS BECAUSE:

2. ____ I don't type fast enough.
3. ____ I didn't sign up to take the final on the computers.
4. ____ I wasn't sure where to go to take the final.
5. ____ I was afraid the computer or the printer wouldn't work.
6. ____ I was afraid I would make a mistake and lose my paper.
7. ____ I didn't get enough practice using the computer.
8. ____ My instructor advised me not to take the final on the computer.
9. ____ I would never risk taking a TEST on the computer.
10. ____ I didn't think I would get as high a score using the computer.

11. OTHER REASONS INCLUDE:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________