## Computer-Assisted Writing Improvement for the Hearing Impaired

<table>
<thead>
<tr>
<th>Funding Category &amp; Award</th>
<th>Eligible Program</th>
<th>Project Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant = $8,229</td>
<td>D --- Ed Services For New Clientele</td>
<td>Developmental Model</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project Product</th>
<th>Project Topic #1</th>
<th>Project Topic #2</th>
<th>Academic Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Programs</td>
<td>Disabled Students</td>
<td>Hearing Impaired</td>
<td>Writing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project Director</th>
<th>Project Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norm Crozer, Director Special Services</td>
<td>Don Love, Dean Academic Affairs</td>
</tr>
</tbody>
</table>

The purpose of this proposal is to develop a set of computer lessons to give hearing-impaired college students practice finding and correcting writing errors common to their group and thereby improve their own writing. The lessons produced by this project will be usable as a supplement to a structured classroom environment or as a self-teaching device apart from an English class. The lessons will also provide corresponding increases in performance in all classes which require writing. These lessons will be equally suitable for any language-impaired students in California community colleges.
Computer-Assisted Writing Improvement for the Hearing-Impaired

The purpose of this proposal is to develop a set of computer lessons to give hearing-impaired college students practice finding and correcting writing errors common to their group and thereby improve their own writing. The lessons produced by this project will be usable as a supplement to a structured classroom environment or as a self-teaching device apart from an English class. The lessons will also provide corresponding increases in performance in all classes which require writing. These increases will also result in a lower attrition rate among hearing-impaired community college students. These lessons will be equally suitable for any language-impaired students in California community colleges.

Educationally, deafness is more of a language handicap than a hearing handicap which is why the deaf are six to ten grade levels behind their hearing peers. One of the primary reasons for this deficiency is the lack of reinforcement through repetition that hearing people enjoy all through life. In the area of writing, the deaf can learn the rules of grammar, but they lack a mechanism that provides repetition which, in turn, is the means by which these rules are internalized. If the deaf can be taught to recognize the writing errors' they themselves make, and if this process can be internalized through repetition, then the students' writing must also improve. Since the use of textbooks is inadequate to address the improvement of poor writing skills, and since the resources to assist deaf and other language-impaired students are insufficient due to staffing constraints and funding reductions, the ideal solution to this writing dilemma is the computer. A search has revealed, however, that no computer materials exist that is intended for deaf college students in the area of writing improvement. The computer lessons developed in this project will help improve the writing skills of deaf community college students. The lessons will also aid support programs by reducing the need for instructor or tutor time in this regard.

Briefly, the objectives of this project will be to: 1) compose sentences and paragraphs to be used as data for the programs; 2) write computer programs for the data and pre- and post-test program with its data; 3) field-test the lessons in pre-selected community college hearing-impaired programs in California; 4) revise the lessons based upon recommendations from the participating schools; 5) field-test the revised lessons; 6) if necessary, revise the lessons using new feedback from the participating colleges.

The activities to accomplish these objectives will include: 1) contacting certain California community colleges to establish which will participate in the pilot program; 2) writing the
sentences and paragraphs for the lessons; 3) writing the computer programs for the data; 4) writing support material for using the lessons; 5) gathering and implementing the recommendations for change from the participating schools, 6) resubmitting revised lessons; 7) gathering and implementing final recommendations for changes from the schools.

The budget for this project will be allocated for the project director, data entry typist, computer consultant, and duplication and dissemination of the lessons. The total requested is $9,195. The in-kind match from the LACCD will cover facilities and administrative costs.

The computer lessons will be disseminated at cost through the publication of projects supported by the Fund, and a flier describing the lessons and acknowledging the Fund that will be sent to all California community colleges.
Computer-Assisted Writing Improvement for the Hearing-Impaired

1. Specific Educational Program Being Addressed

Introduction

The Los Angeles Community College District (LACCD) has assigned to certain of its schools the responsibility for providing services and classroom instruction for students with various kinds of disabilities. Los Angeles Pierce College is one of two colleges in the district assigned to provide services for hearing-impaired students.

Instruction at Pierce in the area of the deaf is conducted by one full-time instructor. The program for the deaf includes courses in English, reading improvement, vocabulary development, and study skills. This program also has a self-contained computer laboratory containing nine Apple microcomputers and a library of computer programs developed especially for the deaf program at Pierce by the project director. Two of the six Fund for Instructional Improvement grants received by the project director have supported development of software in the areas of reading and vocabulary development for hearing-impaired students (See resume on the last page).

Educational Program Addressed

The purpose of this project is to develop a set of computer lessons to strengthen the ability of hearing-impaired students to recognize and correct the common types or writing errors made by them. These lessons will primarily address the special learning needs of the hearing-impaired community college student, but the lessons will also benefit any other language-impaired student including learning-disabled and foreign students. These computer lessons will supplement either special or regular English classes.

This project will build upon two sets of computer programs written for the deaf by the project director through two prior grants from the Fund for Instructional Improvement titled: "Computer-Assisted Instruction in Multi-Meaning Vocabulary" and "Computer-Assisted Instruction in Contextual Word Analysis" (project numbers 244-82-02, 1982-83; 244-83-01, 1983-84).
The project in this proposal will be conducted singly; the only other involvement will be in clerical services and a computer programming consultant. The project director will call upon the experience gained in developing a library of computer programs which complement the programs written for the Fund. These programs cover the areas of English grammar and vocabulary development. To date the project director has produced a total of one-hundred and forty seven such computer programs.

Basic Agenda Addendum

This proposal is not addressing any of the recommendations of the Board of Governors' Basic Agenda Addendum.
2. Specific Problems Being Addressed

Specific Problems

Educationally, deafness is more of a language handicap than a hearing handicap. Depending on the age of onset and severity of the hearing loss, the language development of deaf students at the time of high school graduation is from six to ten grade levels behind that of hearing students. [Moores, Donald, Educating the Deaf, Boston, Houghton Mifflin Co., 1982.] In this regard, the deaf are in a double bind because language mastery, particularly expressive language mastery, is more a product of repetition and immediate feedback of appropriateness than it is an understanding of a set of grammatical rules. Language is learned by repetition, but more importantly for college-age students, language is reinforced and refined by repetition. Repetition leads to the ability to recognize your own or other's writing errors, which, in turn, forms good writing habits. Deaf students can study English grammar and syntax, but because they do not have an opportunity for the reinforcement through repetition that hearing students get automatically and continually, the deaf are not able to produce or recognize good English sentences. Without access to the mechanism of repetition, the deaf will never fully master written English.

A major problem faced by deaf students, therefore, is how to compensate for the lack of repetition as a mechanism for full mastery of written expression. Ideally, a one-on-one tutorial situation for each student would offer the best opportunity for providing this repetition. Of course, this is not practical or cost-effective. Books provide even less opportunities for addressing this need because books cannot provide the interactive dialogue required to provide meaningful repetition. Where then can the deaf students turn?

The only instructional tool available which satisfies the needs of the deaf in the areas of repetition and reinforcement of writing, while at the same time avoiding the limitations and drawbacks of the other alternatives is the computer. As an extension of the instructional process, the computer can provide an excellent mechanism for dialogue and can provide the opportunity for repetition that is so vital to the mastery of language concepts for the deaf. For any given grammatical concept to be mastered, computer programs only need to be presented to the students with enough practice data to insure that almost any student will master the concept before the data is exhausted. The computer can "talk" to the student and never become impatient; it can give clues or remind the student about important ideas or concepts; it can provide immediate feedback for right and wrong answers and focus student attention on special areas or topics; it can determine if additional work is required or if a particular section needs to be redone by the student.

Historically, programs for the deaf have had to rely on materials written for hearing students. In essence, the curriculum has always had to be changed to fit these materials; deaf students have never had materials that addressed their specific educational needs. While there has recently been an increase in such conventional educational materials as textbooks and
workbooks written for the deaf, a search of periodic literature relating to the education of the deaf and of the Educational Resource and Information Center (ERIC) has revealed that there exists almost no computer software that is written for the deaf. That search also showed that there is absolutely no computer software available that addresses the area of writing improvement for the deaf.

The primary outcome of this project will be the development of a set of computer lessons with the goal of improving the writing skills of deaf and other language-impaired community college students. These computer lessons will give deaf students practice in analyzing, locating, and correcting many of the same kinds of writing mistakes that are commonly made by them. This will provide the reinforcement and repetition deaf students need. These lessons will be presented in a pre-written data format ranging from sentences to essays. The built-in errors within these data forms will be drawn from a set of writing errors that will be developed as a part of this project. The project director will utilize his experience in teaching the deaf at the community college level and in developing a library of computer software for the deaf during the past twelve years.

A secondary outcome of this project will be a reduction in the time tutors and instructors currently spend working with deaf students in these areas. This, in turn, will also reduce the funds presently needed to provide this help.
3. Population To Be Served

Population Served

Any language-impaired student can benefit from the use of these computer lessons. Included in this population are the deaf, the foreign born, the developmentally disabled, the learning disabled and the socially disadvantaged. While it is difficult to estimate the number of students in this aggregate California population, a conservative estimate range would be 5,000-10,000.
4. Objectives

Objectives

The overall objective of this project is to produce a series of computer lessons to improve the writing skills of hearing-impaired community college students. Specifically, the objectives are to:

1. Determine which California community colleges will be willing to use the computer programs on a pilot-program basis. (July, 1987 No budget allocation for this objective.)

2. Formulate a set of writing errors commonly made by deaf community college students. (JULY. Proposed budget $1.236)

3. Compose 200 sentences, each sentence including errors from the set of writing errors developed in this project. These sentences will be organized into 10 lesson groups. (July. Proposed budget $1,236)

4. Compose 100 short paragraphs including errors from the set of writing errors developed in this project. Each paragraph will comprise a lesson unit. (July. Proposed budget $1,334)

5. Compose 50 essays including errors from the set of writing errors developed in this project. (July. Proposed budget $1,486)

6. Write three computer programs to handle the three different kinds of data as outlined above. (August. Proposed budget $911)

7. Create a computer program to keep a record of who uses the lessons and which lessons they completed. (August. Proposed budget $157)

8. Write a pre- and post-test (data and computer program) to be used by the students on the computer. (September. Proposed budget $453)

9. Write a short handbook including instructions and suggestions for use of the lessons. (October. Proposed budget $261)

10. Submit the computer lessons to the participating schools and request suggestions for improvements and revisions. (October. Proposed budget $25)

11. Gather and organize the suggestions for changes coming from the participating schools. (October-December. No budget allocation for this objective.)
12. Make revisions in the appropriate programs and data based on the recommendations for changes from the project director and the participating schools. (January, 1988. Proposed budget $1,765)

13. Re-submit the new computer lessons to the participating schools and request additional suggestions for improvement. (February. Proposed budget $25)

14. Gather and organize suggestions about further modifications and make changes as required. (April. Proposed budget $306)
5. Workplan Narrative

Activities

Because of the nature of the project, the evaluation procedure will occur during the two dissemination stages of the project. The participating instructors and students, as well as the results of the pre- and post-testing, will act as the sources for the evaluations of the lessons and as the measures of their effectiveness.

To carry out the first objective, i.e., determine the schools to participate in the pilot program, the project director will call various California community colleges having full programs for the deaf and determine which schools will be interested in using the computer lessons. Several schools already contacted have voiced a desire to participate in the pilot program and use the lessons in their final form.

To carry out the second objective, i.e., formulate a set of writing errors commonly made by community college students, the project director will utilize samples of deaf students' writing gathered over years of teaching the deaf at Pierce College. The data developed for two of the other FII grants will also be used as areas for error correction. The comprehensive set of errors will include five grammatical areas: (1) noun-verb agreement, (2) verb forms, (3) misuse of dependent clauses, (4) misuse of articles, (5) incorrect forms of words (e.g., "improve" as compared with "improvement").

To carry out the third objective, i.e., compose 200 sentences, the project director will create sentences and form them into groups of 20 sentences. The vocabulary and general difficulty levels of the sentences will be kept consistent with that of the deaf students who will be using these programs. The sentences will be written so that deaf students can understand them, and thus, be able to apply their full concentration on locating and changing the built-in errors.

To carry out the fourth objective, i.e., compose 100 short paragraphs, the project director will develop the data in such a way to insure that the deaf students do not have to struggle with understanding the vocabulary or with the reading required.

To carry out the fifth objective, i.e., compose 50 essays, the project director will utilize several types of stories including narratives, dialogues and descriptives.

To carry out the sixth objective, i.e., write three computer programs for the above three objectives, the project director will utilize his programming knowledge to create a program which will allow the students to move the flashing cursor on the screen to a word they feel should be changed. Pushing the return key after moving the cursor will first indicate to the student if indeed there is an error at that place in the sentence, and then allow the student to type the correction if that is needed. The cursor can also be moved to a blank between words to add words or punctuation. The program will not allow the student to proceed to the next line.
until they have found and corrected all errors in a line. If the student cannot determine some errors, the correct answers will be shown to them. A count of incorrect answers will be stored in the computer, and if the student exceeds a certain number of incorrect answers, they will be required to do the sentence, paragraph or essay again.

To carry out the seventh objective, i.e., create a computer program to keep a record of who uses the lessons and which lessons they completed, the project director will modify the record-keeping program already written in the previous two grants.

To carry out the eighth objective, i.e., write a pre- and post-test, the project director will modify the computer programs already written in the previous two grants, and create sample data to correspond to the types of errors and sentences to be practiced.

To carry out the ninth objective, i.e., write a short handbook, the project director will outline the project including its goals and activities. There will be a section on how to use the record-keeping program and how to use the new data program. It will also outline all of the kinds of errors that are in the exercises.

To carry out the tenth objective, i.e., submit the lessons to participating schools, the project director will mail sufficient copies of the computer disks with the handbook and a cover letter describing how to evaluate the lessons and how to make recommendations for changes.

To carry out the eleventh objective, i.e., gather and organize the suggestions for change, the project director will insure that such suggestions for changes are forthcoming from the participating schools.

To carry out the twelfth objective, i.e., make revisions based on the recommendations for change, the project director will review the recommendations for change, and those that are consistent with the objectives of the project and do not violate the integrity of the lessons themselves will be incorporated into the project. New vocabulary in the sentences may be substituted for some that have been determined to be inappropriate or whose meanings are beyond the reading levels of the students.

To carry out the thirteenth objective, i.e., resubmit the revised version of the lessons to the participating schools, the project director will send copies of the revised computer disks to each of the participating schools. Further recommendations for change will be requested.

To carry out the fourteenth objective, i.e., gather and organize data for further modifications, the project director will incorporate any such suggestions in a final copy of the lessons.
6. Expected Outcomes

Expected Impact and Transferability

Since many disabled student programs in the colleges have trouble providing services addressing the improvement of language difficulties, and because many other college programs for disabled students have neither the facilities nor the money to provide these services, the usefulness of this project would be considerable. The project's cost-effectiveness and ease of replication would further help to promote its use, especially because the numbers of these students are increasing.

Language-impaired students consistently have more academic problems than students without language impairments. The reason for this is simple: information is transmitted through language. Many regular college instructors expect their students to be able to demonstrate knowledge of the subject matter through writing. Furthermore, all instructors expect to be able to relate to students' questions and concerns through dialogue, but in the case of the deaf, this communication must be in the form of writing; if a student's writing is poor, the communication is impaired and the instructor is given a false impression of the student's intelligence. It is understandable, therefore, that language-impaired students often experience a great deal of frustration in college. These students have difficulty establishing a positive relationship with instructors because they can neither demonstrate their mastery of a concept, nor easily communicate with the instructor. Any assistance in the improvement of the language skills of these students will definitely impact the typical instructional setting. Improvement in the writing skills of language-impaired students will make their instructors feel less frustrated and more receptive to having these students in their classes.

Success in the use of this project will give language-impaired students more personal and academic self-confidence because they will be better able to express themselves and thus will have more opportunities to demonstrate their knowledge of subject matter, which will result in a lower attrition rate.
7. Evaluation Plan

Within the LACCD, the two colleges having full-service hearing-impaired programs, Los Angeles Pierce College and Los Angeles Trade Technical College, will receive copies of the computer lessons to use with their hearing-impaired students on Apple computers. Evaluation sheets will be sent to the instructors involved, and there will be periodic contacts with these instructors. Evaluation sheets will also be given to the hearing-impaired students to get their ideas for further revisions to the lessons. Pre- and post-testing of the students’ ability to recognize and correct their own writing errors will provide clues concerning the merit of the lessons and also show directions for change. Finally, copies of the revised computer lessons will be sent to the same schools for final review and comment by both students and faculty. A report concerning the changes and revisions of the lessons will be sent to the District office and their response will be included in the final report to the Fund.
8. Dissemination Plan

Information for Dissemination

A copy of the computer lessons will be forwarded to the Chancellor's Office, California Community Colleges. The project director will also use the booklet describing the projects supported by the Fund for Improvement of Instruction to alert the state's community colleges to the existence and availability of the computer lessons.

Upon completion of the revised lessons, a flier describing the lessons, how the project was funded, and the cost of duplication will be sent to all California community colleges.
9. Budget Narrative

[NO "BUDGET NARRATIVE" ACCOMPANIES THIS DOCUMENT.]