DOCUMENT RESUME

ED 423 620 EC 305 950

AUTHOR	Kolvitz, Marcia, Ed.
TITLE	Examining Academic Issues.
PUB DATE	1996-00-00
NOTE	58p.; Section 3 of Challenge of Change: Beyond the Horizon, Biennial Conference on Postsecondary Education for Persons Who Are Deaf or Hard of Hearing (7th, April 17-20, 1996, Knoxville, Tennessee); see EC 305 947.
PUB TYPE	Collected Works - General (020) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	*College Students; Communication Skills; Computer Managed Instruction; Computer Software; *Deafness; English (Second Language); Evaluation Methods; Higher Education; Literacy; *Partial Hearing; Portfolio Assessment; Portfolios (Background Materials); Science Instruction; *Second Language Instruction; Sign Language; *Student Evaluation; Thinking Skills

ABSTRACT

These six conference papers from the Biennial Conference on Postsecondary Education for Persons who are Deaf or Hard of Hearing focus on academic issues relating to individuals with deafness or hard of hearing. The first paper, "Exploring Assessment Alternatives for Deaf Students" (Karen Clack), discusses different methods of evaluating students such as self-assessments, critical thinking analyses, communication analyses, and student-generated portfolios. The second paper, "Classroom Assessment of Writing: Purpose, Issues, and Strategies" (John Albertini), provides strategies for assessing the writing of students with deafness. "Teaching ESL to ASL Users" (Anna Vammen and others), highlights the collaboration efforts of the Disability Support Services program and the Intensive English Language Program at the University of Arkansas at Little Rock. The papers "ESL Tutor: Educational Software for Improving English Skills of Students Who Are Deaf" (Dave Zenk) and "Computer Mediated Literacy Development in Deaf and Second Language Populations" (Beth O. Carlson) describe computer programs to help college students improve their English vocabulary, writing, and literacy skills. The final paper, "Supporting Science Teachers through a National Network: The Access to English and Science Outreach Project (AESOP)", describes a workshop that assists science teachers of students with deafness. (Papers contain references.) (CR)

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ED 423 620

Examining Academic Issues

Conference Proceedings
1996

Challenge of Change: Beyond the Horizon

Seventh Biennial Conference on Postsecondary Education for Persons who are Deaf or Hard of Hearing, April 17-20, 1996, Knoxville, TN

Conference Sponsors:
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at the University of Tennessee, Knoxville

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Exploring Assessment Alternatives for Deaf Students*

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At a time of growing concern about assessment and increasing need to prove successful learning outcomes, professional educators who work with deaf and hard of hearing students may find themselves in a quandary. For many students who are deaf, as well as for hearing children who learn English as a Second Language (ESL), traditional, standardized English-based tests often do not adequately reflect their potential. Yet no other institutionally accepted form of educational assessment is currently available.

As a teacher working with deaf adults who are making the transition from high school to college, I continually face the challenge of locating assessment tools that accurately diagnose their strengths as well as their weaknesses. Talking to colleagues who work with ESL students, I discovered that we share similar challenges; the non-traditional learners we serve, no matter how impressive their classroom performance, tend to struggle with standardized assessment methods.

While these tests may offer neat, clean statistics, they seldom provide adequate information about the students involved. Standardized tests serve one primary institutional purpose; they are considered a quick way to predict a student's ability to succeed in the college or university environment. But as we have repeatedly seen, standardized tests do not provide an accurate gauge with regard to students who are deaf. For these and other nontraditional learners, such tests seem only a way to reduce their achievements to a neat, numerical score, which is then used to determine their future educational placement.

The Search for a New System

A more accurate and equitable system of educational assessment is clearly needed, one that will measure a student's actual skills and knowledge without strict reliance on English, usually the student's second language. Two things are essential: a) students must feel that they are active participants in the evaluation process; and, b) tests need to provide more reliable measures of actual student learning experiences.

A search for innovative, realistic assessment strategies is taking place on several campuses in the state of Washington. The emphasis is shifting toward an assessment approach that empowers students to develop decision-making skills and that evaluates critical thinking and lifelong learning. That approach may take the form of written self-assessments, applied critical thinking, and portfolios of student-generated work. Rather

* Originally published in the March/April 1996 issue of *Perspectives in Deafness and Education* and reprinted with permission from the author.

than reinforcing passive behavior, these methods encourage active student participation in the learning and evaluation process.

While the students I teach are high school seniors and graduates, I believe that the assessment tools we have developed can be used with equal effectiveness for junior high and high school age students. With some adjustments in content material, these methods can be adapted to fit a great variety of educational settings, subject areas, and ability levels.

Worthwhile assessment strategies should include the goals of encouraging critical thinking and the development of lifelong learning skills. The assessment examples that follow can help students reflect on what they are learning and develop connections among concepts and principles, applying them to their lives and the larger society. These methods can be used with students of a variety of ages and grade levels, with teaching materials tailored for the target audience. They can be used successfully for the collection of pre- and post-test data, as well as for evaluation of unit-specific learning.

Student Self-Assessments

Written self-assessments require students to critically analyze what they have learned and its application in their lives. In teaching transitional courses for deaf students about to enter college, written self-assessments encourage them to evaluate and synthesize important information they have learned.

For example, Seattle Central Community College offers a college transition program for deaf students called "Orientation to College Success." Among other things, it encourages students to think critically about a variety of health matters, including HIV and AIDS awareness. After participating in several concept building sessions about the issues of HIV/AIDS and personal responsibility, students take part in a directed group activity that includes a model for making decisions. They learn that they must think about the topic, seek additional information as necessary, and formulate their responses to the problem. They then develop ideas of how and why they can support their responses, as in the following example:

> You have been dating someone for about four months. Both you and your partner were tested for HIV, and you both tested negative. Now your partner refuses to use condoms during sexual contact, claiming there is no risk.
>
> Based on what you have learned about HIV and AIDS, how would you respond to this situation? Why? What would influence your decision? Why?

A modified written self-assessment would encourage young adults to think critically about how they might respond in a similar situation, while providing teachers with a method for evaluating their grasp of key concepts. This kind of exercise gives students an opportunity to relate new concepts to their own lives and to envision how they might cope with similar situations.

Critical Thinking Analyses

Teachers can assess critical thinking skills through a variety of nontraditional methods. Videotaped scenarios can be used to illustrate key concepts, encouraging students to analyze what they see, and to apply newly learned concepts. Dr. George Bridges, a University of Washington Sociology professor, has developed the following method of using videotaped material to collect pre- and post-test data for an introductory sociology course.

On the first day of class, students watch a racial confrontation in a film clip from Spike Lee's film, *Do the Right Thing*. Dr. Bridges asks them to respond to the clip through written analysis, incorporating appropriate sociological principles. At the end of the quarter, Bridges repeats the clip and asks students to evaluate the scenario again. Comparing pre- and post-test analyses provides valuable information about student learning and achievement.

My course, "Orientation to College Success," uses a limited version of this assessment technique. I introduce a portion of the course that deals with date or acquaintance rape with a segment from *The Grey Area: His Date/Her Rape*--an educational video tape developed for deaf high school and college students by the National Technical Institute for the Deaf. The segment depicts a dating situation that leads to rape. I do not describe the material before showing it; I simply ask students to pay attention to the behavior of the people involved.

After watching the scene, students write what they noticed about the behavior of the characters. I ask whether they think the woman in the scenario was actually raped, or was a willing participant in a sexual situation. Students discuss their observations as a group.

Then I present information about date and acquaintance rape, and introduce a workshop about date rape presented by an educator from the Abused Deaf Women's Advocacy Services agency (a local service for abused deaf women and men). Students complete a variety of relevant reading and writing assignments. At the end of the unit, students watch the initial video segment again for assessment purposes. After the second showing, students think critically about what they have learned and reapply those ideas to the situation they have seen.

Analyzing Communication

Another example of critical thinking assessment involves consumer responses to mass media. It can be used in reading, writing and language arts classes. This teaching unit encourages students to look beyond slick television and magazine advertisements and to analyze the techniques of manipulation advertisers use to sell products and services. Students begin by bringing samples of magazine advertisements to class. I provide videotapes of television commercials and overheads or copies of print advertisements for class discussions. Students learn about the various propaganda methods advertisers use to appeal to consumers and pinpoint examples of these techniques in actual advertisements.

One classroom activity might be to analyze an ad that shows a group of people having a good time together, seemingly enjoying the use of a particular product. The actual function of the product may have little or nothing to do with the fun and excitement portrayed in the advertisement. But lonely consumers may be struck by the fact that the people in the ad seem to be having a good time -- a situation infinitely more appealing than feeling alone and left out.

After discussing and reviewing these concepts, students -- either individually or in groups--prepare presentations for the class and submit written analyses of a variety of advertisements. This is an effective way to get students involved in critical thinking as well as in reading, writing, and presenting their ideas.

Students and Their Portfolios

Another popular assessment approach is the student-generated portfolio. Creating a portfolio gets students personally involved in the assessment process, as they evaluate and select their own best work for revision and re-submission.

Student portfolios can document progress and growth in virtually any area of academic or technical study. They can be used to highlight student achievement in a variety of skill areas, from reading and writing to the development of mathematics and technical skills, including word processing, desktop publishing, photography, and apparel design. Students can also use portfolios to provide clear evidence of their ability to evaluate and improve their own work, thus indicating self-monitoring and self-correcting skills that are invaluable in personal life and the world of work. Portfolios offer an added benefit during the search for a job, giving potential employers a realistic way to evaluate the abilities of prospective employees.

Teaching students about the kinds of materials to be included in a portfolio begins the process. They should begin the school term by creating a folder to hold most of their work for the coming quarter. As assignments are completed and evaluated, they are placed in the folder, culminating with a final critical thinking, skills-based evaluation. I give students my evaluative criteria, which may be course specific or oriented to general competency, before they select items to include in their final portfolios.

As part of the basic criteria for item selection, students examine all of their work for the class and include materials that will demonstrate progress over time, and items that can be revised to indicate mastery of concepts or skills. After they make their selections and revisions, students write reflective papers, summarizing what they liked about the process and what they have learned. Students then present their final portfolios to the class and submit them for evaluation.

Personal Involvement

These innovative approaches have the virtue of minimizing the cultural and linguistic biases of traditional assessment. They get students involved in the assessment process, taking responsibility for their own education and their own future. Clearly, having a personal stake in the outcome is great motivation.

When students play an important role in the evaluation process, the appropriate techniques can spotlight learning and achievement. Rather than simply a way to constrict and evaluate performance, assessment becomes a useful tool for growth and learning.

As teachers become increasingly responsible for teaching to and monitoring achievement of educational goals and objectives, it seems likely that creative assessment approaches will be more widely accepted. At Seattle Central Community College, instructors in the Regional Education Center for Deaf Students and the Adult Basic Education Program (ABE) use portfolios to aid in making decisions for student placement.

At this time, most colleges continue to rely on standardized tests for student placement in English and mathematics courses. But as we continue to collect data and empirical evidence that supports the use of non-standardized assessments, I believe we can make a strong case for that approach.

As teachers, it is helpful for all of us, to the extent that is feasible, to keep data on the assessment techniques we find useful in our classrooms. Only through clear evidence of their validity will alternative assessment methods gain the widespread respect and acceptance they--and our students--deserve.

Classroom Assessment of Writing: Purpose, Issues, and Strategies*

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Freedom is feeling easy in your harness.
-- Robert Frost

Purpose of Classroom Assessment

As teachers of writing we are expected to assess and evaluate students' writing and to help colleagues in other departments do the same. Whatever our approach to the teaching of writing, we must assign grades and prepare students for programmatic assessment. As Peter Elbow (1993) has noted, "Much of what we do in the classroom is determined by the assessment structures we work under" (p.187). In the field of second language writing assessment, the return to the direct assessment of writing, as seen as an attempt to make the assessment structures we work under more valid. In some school districts and colleges (see for example, Brand, 1992 and Weiser, 1992), portfolio assessment is being used as an alternative to testing, Here, I argue that the best assessment of writing in the classroom is an on-going, descriptive documentation of behavior and attitude, and that conscientious assessment at this level will allow us to move more freely in the harnesses of program-level evaluation.

The assessment strategies considered here are both valid and manageable at the classroom level; that is, they reflect real writing behaviors and strategies that teachers already use for instructional purposes. To assess writing, teacher becomes researcher and observes, records, collects, categorizes and evaluates data. The data includes documentation of changes in attitude and knowledge of oneself as a writer as well as the acquisition of skill. Because we want the student to become involved in the assessment process, the strategies go beyond observation by the teacher and include collaboration with and reflection by the student. Finally, it is important to note that assessment activities may be conducted in more than one language, and the data itself may be recorded in written or videotaped form.

Assessment and Evaluation

When I ask teachers what they remember about evaluation of their own writing, they recall corrections in red ink, marginal comments, and no comments at all. They recall feelings of surprise, when, daring to take a risk, they are penalized for doing so. They also recall critical but encouraging comments from some instructors and not wanting others to lay a finger on their writing. Along with a shift in emphasis from product

*This presentation was made in June, 1994 in Atlanta, Georgia at *Tools for Language: Deaf Students at the Postsecondary Level*, a PEC-sponsored mini-conference.

to process in composition instruction (Hairston, 1982), has come the point of view that not all writing should be evaluated; and, following Weaver (1990, p. 182), it may be useful to distinguish between everyday documentation and periodic judgment. Here, I take assessment to mean an analysis and interpretation of that data for the purposes of grading or placement. Traditionally, we have graded and corrected students' writing. Recent experience and research suggest that we should also consider rating their writing holistically and responding without evaluation.

Grading versus Rating

Grading is the practice of assigning points or letter grades to an essay according to certain criteria. We assign a grade to indicate how much of a certain criterion is present in the writing. Assuming we have the same criterion for all our students, a grade of "B" should mean the same thing from essay to essay. Grading involves a scale composed of intervals; and the intervals or units on this scale may be added and subtracted.

Rating (or "ranking") involves a different kind of scale. Here, judges rate the quality or relative "goodness" of writing samples along an ordinal scale (Hatch & Farhady, 1982). Examples of such scales are holistic rating scales with values ranging from 1 to 6 points, 0- to 100-points, or "poor" to "excellent." Holistic ratings of writing samples are now preferred over indirect, multiple-choice assessments of writing skill for students who are deaf or hard of hearing as well as hearing students of English as a second language (Albertini et al., 1986; Berent et al., 1994; Jacobs et al., 1981).

At NTID, holistic ratings are used to place new students in developmental writing courses (Bochner et al., 1992) and to admit students into degree-prerequisite composition courses at RIT. For the former, students are given thirty minutes to write a short essay about first impressions of NTID. Each essay is rated on a scale of 0-100 points by three experienced raters (English instructors), and the three ratings are averaged to yield a single score. The scoring procedure directs raters' attention to four categories--content, organization, language and vocabulary--and is thus a "modified holistic" rating procedure. Training and the practice of averaging raters' scores increase the reliability of the score. For instructors interested in improving the reliability of classroom ratings, such a procedure is feasible. It only requires collaboration and some consensus among instructors.

When a colleague in civil technology asks for advice about grading deaf students' lab reports and is overwhelmed by the report's grammatical anomalies and departures from the expected format, we suggest that the colleague <u>not</u> assign a single letter grade to the report. Rather, we advise grading content, organization, language, and mechanics separately. At NTID, a concern for the improvement of lab reports has led to cross disciplinary collaboration among English and technical faculty (Shannon, Keifer, & Senior, personal communication).

Correcting versus Responding

The efficacy of correcting students' writing continues to be debated. One report from the University of Minnesota (Semke, 1984) indicates that accuracy, fluency, and general language proficiency in the writing of students of German was enhanced by practice, not error correction. In a study of home and school influences on low-income children's literacy, researchers report that

> instructional techniques that rely heavily on teacher corrections, that stress producing mechanically perfect texts, and that fail to provide an appreciative audience for even the poorest writers' efforts, may be especially frustrating to children who confront the writing task with little confidence in their ability to say something of interest to others (Snow et al., 1991).

Anecdotal reports from adult deaf writers indicate that the sight of school papers "bleeding with red pencil" adversely affected their motivation to write (Gustason, 1992, p.64). On the other hand, teachers of writing to hearing second language learners (for example, Reid, 1994) argue that, as editors, mentors, and surrogate audiences for academic writing, they cannot abrogate the responsibility to correct unsubstantiated conclusions or departures from standard form and acceptable usage.

With adult students, negotiating an appropriate time and context for correction is one solution. Also, selective correction of only those errors related to the main objective of an assignment will reduce student frustration and increase learning. In the civil technology lab report, the steps of a particular test must be reported accurately. Clear description of grammatical errors related to clarity and intelligibility was suggested several years ago by Burt and Kiparsky (1974). They categorized sentence level grammatical errors as either "global" or "local" mistakes; and claimed that missing or inappropriate clausal connectors and tense inflections were "global" in that they affected overall intelligibility more than missing noun inflections and articles ("local" mistakes). *Figure 1* includes a list of the major error types according to their definitions.

Figure 1

I. Global Mistakes - Those that confuse the relationship among clauses, such as:
   A. Use of connectors
      correction: change conjunctions, relative pronouns
   B. Distinction between coordinate and relative clause constructions, or the order of constituents
      correction: put relative clause immediately after its antecedent head noun
   C. Parallel structure in reduced co-ordinate
      correction: add missing subject
   D. Tense continuity across clauses
      correction: change endings

II. Local Mistakes
   A. Articles
   B. Inflections
   C. Auxiliaries
   D. Prepositions
   E. Vocabulary

Burt & Kiparsky, 1974

What to correct is one question; another is, when. For several years now, advocates of the writing-as-process approach have suggested that we reserve grammatical correction to final, "pre-publication" stages of writing. A new writer, they argue, should be allowed to focus first on content and arrangement, then on style and mechanics. An instructor and other readers can promote continued writing and revision by reflecting what is seen, heard or felt in the piece. Such feedback may be simply the reiteration of striking works, phrases or ideas and is decidedly non-evaluative. Comments such as "I like ...," "I don't like...," and "You should...," are withheld. Responding without correction in teacher-student conferences and in writer groups may be particularly effective with writers whose concern for correctness interferes with concept formation and fluency. Peter Elbow (1993) reports that the creation of "evaluation-free zones" at the beginning of each semester improves both students' writing and his own attitude towards it. He reports "liking" students' writing better and, as a consequence, being more able to criticize it constructively.

Non-evaluative response establishes a connection between writer and reader. A student writes to satisfy a requirement; a writer writes to connect with a reader. Responding to a student's text with experiences of our own shows a personal connection to that text. Such connections should motivate a student to continue writing. I once asked a colleague to comment on a personal piece of writing concerning a student's violence at home. My colleague's response began, "I remember when I was so angry that I ..."

Strategies

Classroom assessment of writing begins with the instructor but involves the student as soon as possible. The instructor may use logs, checklists or grids. Logs and checklists document work completed but also milestones and problems along the way. A grid, which is a list of criteria plus a simple rating, is a useful way of summarizing an assessment of one piece or a collection of pieces in student-teacher conferences. Peter Elbow (1993) uses an analytic grid (shown in *Figure 2*) to comment on student papers and to provide evaluation.

Figure 2

Analytic Grid

Strong	OK	Weak	
			Content, Insights, Thinking, Grappling with Topic
			Genuine Revision, Substantive Changes, Not Just Editing
			Organization, Structure, Guiding the Reader
			Language: Syntax, Sentences, Wording, Voice
			Mechanics: Spelling, Grammar, Punctuation, Proofreading
			Overall (Note: this is not a sum of the other scores)

Elbow, 1993

Students are drawn into the assessment of their own writing through conferences and interviews. Donald Murray (1985) suggests that instructors begin individual conferences by asking students to write about

the pieces under consideration. The student should describe what was attempted, what was achieved, and what the next step will be. A dialogue journal is an interactive context where writing may be discussed in writing. Three ground rules for dialogue journal writing are that 1) teacher and student are partners, 2) that the content of the journal is negotiated, and 3) that the writing is never corrected. In this context, the teacher responds on a personal level to what the student has written. In writing classes a dialogue journal may become a writer's notebook where experiences are traded, past writing experiences are recalled, and view of writing are discussed. This interactive writing may be used to seed other, more formal pieces of writing outside of the journal. For some students, the journal context helps trigger recall of experience and reflection on the writing process. If students are willing to comment regularly on their strengths and weaknesses as writers, a longitudinal self-assessment is compiled by the end of the course.

Self-assessment and reflection are our ultimate goals. Questionnaires, student logs and journals will prompt students to consider their strengths and weaknesses as writers. The writing portfolio is another context where reflection is appropriate. According to Yancey (1992), the inclusion of written reflection is what distinguishes writing portfolios from art or investment portfolios. Like these others, writing portfolios are longitudinal in nature, diverse in content, and collaborative in ownership and composition (assuming that the student has received feedback on various drafts from instructor and classmates). Unlike artists or investors, however, the writer is asked to reflect on content and process and to provide some sort of introduction to the pieces. Such commentary may take the form of a "letter to the reader" or short process descriptions preceding each piece. Inviting students to narrate the contents of their portfolios should elicit evaluative comments like, "One of my strengths in writing is ..." and "My writing style has changed so much within the last year or so!"

In practice, writing portfolios combine several forms of documentation and evaluation. A writing portfolio can include product, process and reflection. Inclusion of product and process allows others to evaluate the acquisition of skill or strategy; reflection reveals the writer's attitude and point of view. As an assessment tool, the writing portfolio compares favorably with standardized indirect measures of writing with regard to validity. Given the complexity and variety of real writing tasks, a collection of final drafts written on different topics at different times is more valid than a single sample of writing as well. To the extent that the creation of a portfolio mirrors the writing process followed in other college courses, it is a valid and relevant assessment of a student's academic writing ability (Hamp-Lyons, 1991, p. 263).

On the other hand, the individuality and variety inherent in this method make it difficult to estimate the reliability of portfolio assessment. Comparability and replicability of the evaluations of the portfolios is the issue. Ratings across portfolios become more stable to the extent that we can elicit the ratings of colleagues who read the final drafts with the same criteria as we do. One additional rating greatly improves the reliability of a final evaluation; and an additional set of comments provides the student with objective feedback in the sense it is a response from someone who has not been involved in the process of writing the pieces.

Teachers who use portfolios generally have a preference for process writing approaches and their use is more common in social science and humanities courses than in natural science courses (Johns, 1991). Instructors who use portfolios as an assessment tool report that they have had a salutary effect on their teaching (Yancey, 1992). In writing courses, they proved both a focus of study and a record of growth. For students (and teachers) unfamiliar with the method, it is advisable to conduct periodic portfolio checks and even to assign preliminary grades based on quantity and quality. A working portfolio implies but does not ensure genuine revision. Portfolios may include a variety of languages and media. Graphics may add to appearance and interest, and depending on the readership, bilingual pieces and reflection on the writing process may add depth. If we ask colleagues to rate and comment on our students' portfolios, we need to provide explicit rating guidelines and a reasonable number of portfolios to read. On a rating scale of 1 to 5, for example, what does a "5" mean? Suitable for publication in a campus literary magazine?

Conclusion

The techniques described here are simply ways of recording observations and gathering samples. Their use serves a dual purpose: to document learning and to foster writer maturity. Use of these techniques will make students ware of the process and problems, solutions and changes in their own writing. It will also help us loosen the reins without losing sight of the goals. We can encourage risk-taking and also teach editing. Most importantly, when the time comes for evaluation, we can provide students and supervisors with multiple assessments of performance and documentation of change.

Descriptive methods may be used by the instructor, by instructor and student together, and by the student alone. In using descriptive modes of assessment versus standardized tests, we trade uniformity, balance and sometimes breadth for variety, individuality, and depth. Descriptive assessments can augment the reliable but shallow information we get from standardized test scores. Used alone, standardized tests become blinders, fixing our gaze on a narrow path, a limited characterization of a student's abilities. Some have suggested that the use of portfolios may provide the desired link between classroom assessment and large-scale testing (Freedman, 1991) or that placement essays be used in conjunction with portfolio assessment (Brand, 1992). Thus, if we use longitudinal assessment of student writing we may be able to work more easily within institutional structures or ultimately, we may be able to change them.

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Teaching ESL to ASL Users

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Abstract

Historically, it has been the practice of colleges, universities, and other institutions that have English as a Second Language programs to place deaf students who are having problems in composition classes in those programs. At the University of Arkansas at Little Rock (UALR), this has been an occasional practice since 1980, near the beginning of the Intensive English Language Program (IELP). Reasoning behind this was that educators had discovered that many deaf students share similar problems with some of the foreign students learning English: no articles; lack of the verb "to be;" and few, if any, prepositions.

As the 10th and newest affiliate of the Postsecondary Education Consortium (PEC), UALR is committed to expanding and improving services for students who are deaf or hard of hearing. One area of increased focus since the inception of UALR's PEC affiliation has been the need for additional English instruction to students who are deaf and non-native English users or who have deficits in their English education backgrounds. With a task such as this one, each university must examine its own resources in order to develop programs that offer the best available options for its particular situation. At UALR, we chose to collaborate efforts between the Disability Support Services/PEC affiliate program for students who are deaf or hard of hearing and the Intensive English Language Program in order to develop an English as a Second (Foreign) Language class for American Sign Language (ASL) users -- ESL for ASL Users.

PROGRAM COORDINATOR'S PERSPECTIVE

Affiliation with the Postsecondary Education Consortium at the University of Tennessee, Knoxville has allowed UALR and Disability Support Services (DSS) to enhance services to students who are Deaf or Hard of Hearing. These expanded services range from purchasing new assistive listening systems to a summer orientation program to professional development for interpreters and notetakers to the development of a two-tiered English language instruction program for deaf students who are non-native English users or who have deficits in their English education backgrounds. As stated in the UALR-PEC goals and objectives,

> . . . the program will involve coursework geared specifically toward students who are Deaf or Hard of Hearing. The coursework will be developed during the first year of PEC funding. The course will utilize materials and instruction methods from the UALR Intensive English

Language Program (IELP), in conjunction with components used successfully by other PEC affiliates. The course will be developed jointly by the PEC Program Coordinator and IELP consulting staff. Course credit through IELP will be offered.

Preparation and Curriculum Development

Combining the efforts and expertise of our DSS/PEC program staff (and PEC advisory council members) with the Intensive English Language Program allowed us to approach this class in a unique way. Much of the initial preparation involved constant collaboration between myself and the IELP instructor, Anna Vammen, who would teach this course. Although Anna was an experienced ESL teacher and had a vast knowledge of language and the instruction of English to non-native English users, she was not knowledgeable in the field of deafness. Her commitment and desire to teach deaf students the reading, writing, and grammar skills they would need to be successful in their postsecondary career required an extreme amount of studying and learning on her part. This included gaining an understanding of Deaf culture, ASL grammar and syntax, common problems deaf students face in learning English, and basic differences in ASL and English. At the same time, I gained a greater knowledge of the teaching strategies related to English as a second language and English as a foreign language. Together, we were able to outline the initial goals and objectives for this course.

It is important here to clarify our main objective for this course. All students entering UALR who do not possess the skills (as determined by their ACT/SAT scores) to enroll in Composition I are first placed in two developmental courses, College Reading and Composition Fundamentals. Most deaf students entering UALR will follow the developmental track before enrolling in Composition I & II. Over the years, it has been discovered that, although deaf students are passing the developmental courses and possibly the Composition I course, they may still lack the appropriate skills to successfully meet the challenges of the reading and writing required on the postsecondary level. Therefore, our main objective in creating this class became the following:

> To teach students whose native language is ASL to successfully communicate in English through writing, with emphasis also on improving reading skills.

Role as consultant

My biggest part in the creation of this course came during the initial design, preparation, curriculum development, and implementation phases. With the understanding that this is a pilot course and is a 'first-time' experience for all those involved, a continuation of discussion and support concerning the class has been vital. Anna, John West, the interpreter, and I meet periodically during each semester to discuss strengths and weaknesses of the class, any changes that need to be made, and to brainstorm ways we can improve future classes. As the primary consultant for this course, my role during the first two semesters has been three-fold: (1) to act as a support for the instructor by providing additional information on deafness and/or ASL related issues, (2) to communicate with the instructor and interpreter as well as the students in order to assess the course and future changes needed, and (3) to target and recruit students who could benefit from the class.

The Future

Each semester, UALR has approximately 15 deaf students whose primary mode of communication is sign language (including ASL, PSE, and English sign systems). The target size for this class is five to seven students with no more than ten. We would like a small enough class to be able to address the individual needs of the students, yet large enough to engage in group discussion and activities. It is our hope that as this class continues and the number of deaf students entering UALR increases, the popularity and credibility of this course will attract deaf students who desire to learn the English skills necessary to meet their academic and career goals.

INSTRUCTOR'S PERSPECTIVE

ESL and EFL

Two terms that need to be explained are ESL and EFL. ESL stands for English as a Second Language. Teaching ESL involves teaching English to non-native speakers who are living in a country where English is the native language. EFL is English as a Foreign Language, and it is the teaching of English to non-native speakers where, outside of the classroom, the students are in their native language cultures. Teaching ESL or EFL is more closely related to the field of teaching Foreign Languages than that of teaching "English" in the traditional sense, i.e., to native speakers of English.

Most ESL/EFL teachers have studied, speak, or even teach a foreign language. Many have lived in other countries and are, therefore, quite familiar with dealing with other cultures.

There are as many different techniques for teaching ESL as there are in any other education field. Also, there are as many, if not more, different kinds of programs where ESL is taught. This includes everything from kindergarten to university to Adult Education; from the class that meets once a week for an hour to an intensive, all day/everyday class to a friend teaching a friend. Perhaps, though, the biggest thing that sets ESL teachers apart from mainstream English teachers is that every student they teach has a specific goal for learning English -- from being able to play better with kids at recess to studying medicine to being able to go to the grocery store. The teacher is there for the sole purpose of helping the students achieve those goals.

The ESL program at UALR is an intensive English program that works on an eight-week, 9:00 a.m. to 3:30 p.m., five-day-a-week schedule. It is designed to provide foreign students with English classes before they enter the university. It was set up as an intensive program to facilitate the students' learning as quickly as possible before they started college classes. There are four subject areas and classes to fit each of six levels: Grammar, Reading, Writing, and Listening/Speaking.

Incorporating Deaf Students in IELP

As was mentioned earlier, deaf students have been occasionally sent to the program for grammar or writing instruction with varying degrees of success. One of the biggest problems, though, was that IELP's class

schedule did not correspond to the university's schedule, and, since most of the deaf students were already university students, it was hard for them and their interpreters to adjust to the intensive schedule.

In 1994, Susan Queller, the Director of Disability Support Services, made the suggestion that instead of putting the deaf students in an ESL class, why not take an ESL teacher out and put him/her with an all-deaf class. In April of 1995, everything was set in motion and planning of the class began.

One of the first things that was looked at was the strategy of designing the class as an ESL class rather than as a composition class. The most prevalent reason was simply because of what the students needed. Most deaf students have similar problems -- at least superficially -- as most foreign students do with English: lack of or very different uses of key grammatical points, such as articles and the verb "to be"; problems with the irregular verb patterns and uses of the past tense; unfamiliarity with the rigidity of English word/sentence order; and a need for more vocabulary.

Another key in approaching this as English as a Second Language was that in an ESL classroom, the instructor is experienced in teaching the target language to people who do not know it, which sounds like foreign language teaching, but with a twist. The instructor usually does not know the native language(s) of the students, and, therefore, does not use the students' native languages in class. Only the target language is spoken by the teacher. This in itself becomes almost more art than skill because the teacher has to be able to explain the language being learned in the language being learned. If that sounds confusing, try being in a beginning class of 7 students from 7 different languages whose only knowledge of English is "Hello," "Good-bye," and "chicken salad sandwich." Most ESL instructors accomplish this mainly through a lot of patience, knowledge of English, and an understanding of the syntax (if not the language itself) of key elements of the students' languages and the cultures of the students. This is accomplished many ways, but primarily through experience and calling on more experienced teachers for guidance. Talking with others from those cultures is also immensely helpful.

Collaborating Efforts

As an ESL and a foreign language instructor (I also teach Spanish), these were the strategies I intended to bring to the teaching of this class. However, as I progressed in my learning of ASL syntax and Deaf culture during the summer before the class was to start, I realized that what we were actually going to be teaching was EFL -- English as a *Foreign* Language. While the grammar, etc., instruction would not necessarily change, the fact that the students -- outside of class -- would be functioning in their native language and culture, and that the native language would be used in the class as a vehicle of presenting the target language, made this class closer to an EFL class than an ESL class.

Once my colleague, Christy Owen, and I had come to terms with all these methodologies and had learned each other's techniques and idiosyncrasies, we were able to sit down and hammer out our main

objective, which was easy, and the methodology, which was hard and went through several changes before it reached the stage it is in the handouts of the syllabus you have received.

Course Objectives

The next procedure was to decide on the course objectives. These had to be much more specific than the main objective, of course, and tied tighter to the actual course material that would be taught since that material would be chosen specifically to reach these particular goals or objectives.

This, too, was a team effort based on my experience of teaching ESL and new knowledge of ASL syntax and Deaf culture, and Christy's experience and knowledge of the latter two and what particular problems deaf college students have with English learning. Three objectives made it to the final list. In the order they appear on the syllabus, these include:

1. Communicate ideas in written English form. This is basically the grammar and writing part of the class. It stemmed mainly from instructors in other classes having trouble being able to understand the answers that deaf students wrote to essay questions on tests. Two sub-objectives were written to further explain this one:
   - Write standard English sentences.
   - Communicate ideas in paragraph form allowing readability without confusion.

   For this section, we decided that we would need a text that would have grammar in it, yet allow for a lot of practice in writing.
2. Use equivalent English synonyms for ASL vocabulary. The two sub-objectives to this one explain it best:
   - Use English vocabulary that expresses concepts of "feeling" on different levels (e.g., the ideas of *great* to *wonderful* to *marvelous*).
   - Use English metaphors, idioms, and colloquialisms when writing, and to recognize them in reading.

   We felt that this section would be best taught in context with what the students were reading in the class.
3. Demonstrate improved reading skills in English. This last course objective really encompasses the one before it, but it was written separately to stress the fact that the students would not only be learning new vocabulary and idioms, but would be expected to carry that knowledge into reading. Emphasis would be on them learning to:
   - Analyze reading for grammar, vocabulary meaning, and content.
   - Write a brief summary of the reading.

   To accomplish this objective, I decided on two materials: an ESL reader (a story or novel reduced to a particular word level) and a newspaper.

However, before I could finally choose the best texts and materials for the class, we needed to have a good idea of what level the students were reading and writing on. We decided to give the students the placement exams in grammar, reading, and writing used by IELP for three reasons:

1. I would be choosing my materials from available ESL texts;
2. Deaf students have many of the same English-learning problems as foreign students; and
3. IELP already had in place a tried and proven battery of placement exams.

IELP uses the standardized English ALFA exam for grammar placement and in-house generated exams for reading and writing. The program is divided into six levels:

Level 1 - Zero to Beginning English proficiency

Level 2 - Beginning English proficiency

Level 3 - Lower Intermediate English proficiency

Level 4 - High Intermediate English proficiency

Level 5 - Advanced English proficiency

Level 6 - College Preparation

As shown above, a student who places in levels 1 - 5 is considered to have an English proficiency level below what is necessary to successfully enter into college level coursework. A student placing in level 6 may still need some fine tuning but is otherwise ready to begin at least some college level coursework. *Figure 1* shows how students are placed in each level according to their scores on the ALFA English test and IELP Reading test.

Figure 1

Placement Test Guidelines
(ALFA English & IELP Reading)

ALFA Items	Score	READING LEVEL	Total
1 - 50	0 - 15	0	0 - 220
	10 - 25	1	230 - 280
	26 - 40	2	290 - 340
	40 +		
1 - 75	45 - 60	3	350 - 400
	61 +		
1 - 100	65 - 85	4	410 - 460
	85 - 95	5	470 - 500
	96 - 100	6	

* Students must pass the reading level 3, 4, and 5 at 80% to move to the next level regardless of overall score.

The IELP writing placement test uses three prompts to elicit a writing sample from its new students. The prompts ask the students to (1) describe their family, (2) describe a trip in the past, and (3) describe what the student has done since arriving in the U. S. [*Note:* This third prompt was changed to "describe what the student has done since graduating from high school" to accommodate the American deaf students.] The students are given one hour to complete all three paragraphs.

The paragraphs are holistically analyzed for three salient features: control of grammatical structures, especially verb forms; organization; and vocabulary usage. The most important feature to analyze is the student's control of grammar. The most basic grammar point to check is that the student can form correct sentences with Subject-Verb- and Objective/Predicate. *Figure 2* shows how students are placed within the IELP levels.

Figure 2

IELP Writing Exam

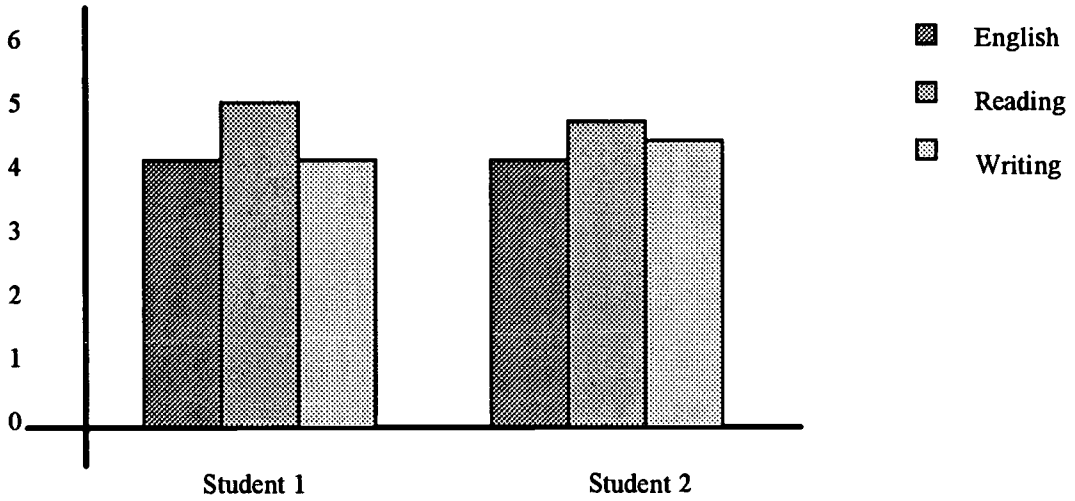
Level 1	cannot write complete sentences/confused about basic sentence structure
Level 2	can write simple sentences with S-V-O constructions but repeat the same words with only minor variations of nouns
Level 3	know difference between and use simple present tense, present progressive tense, past tense, and future tense verbs
Level 4	able to use the present perfect tenses and use some compound sentence combinations -- using and, but, or, & so. Not able to use many complex sentence forms
Level 5	use complex sentences containing independent and dependent clauses (use subordinators, e.g. when, while, as soon as, because, since, and transitionals, e.g. therefore, however, on the other hand).
Level 6	able to do all that Level 5 can with higher levels of vocabulary knowledge and organization of the paragraphs

* Section on evaluating the IELP Writing Exam written by Philip Less, Academic Coordinator, IELP. (Revised and edited for this report.)

The two deaf students tested came out as being generally in the equivalent of Level 4 on all three placement tests (*see Figure 3 below*).

Since this was not to be an intensive class set up as the IELP classes, but a 3-credit-hour university class, it was decided to meet twice a week for 1 1/2 hours per class, with one hour of lab (to be scheduled later). Partly because of the schedule and partly because I could not find the exact test I wanted, I decided not to go with a traditional ESL grammar textbook. Instead, I chose a grammar workbook, GrammarWork 1, which had exercises covering the grammar points that the placement exams showed that the students needed work on. The grammar itself would be taught as it became necessary--i.e., as problems surfaced in the students' writing. In this way, I hoped to make the lessons pertinent and not become a "grammar-bound" class.

Figure 3



To meet the other two course objectives, I chose an ESL reader that is used in IELP's advanced reading class, Eye of the Tiger, and an ESL weekly newspaper, News for You. The reader was assigned as outside reading with discussion questions to write answers to. The students were quizzed on several chapters at a time, after discussion in class. The newspaper, News for You, provided a variety of activities in the way of exercises, cross-word puzzles to practice and learn vocabulary, current events, quizzes, and lots of vocabulary work.

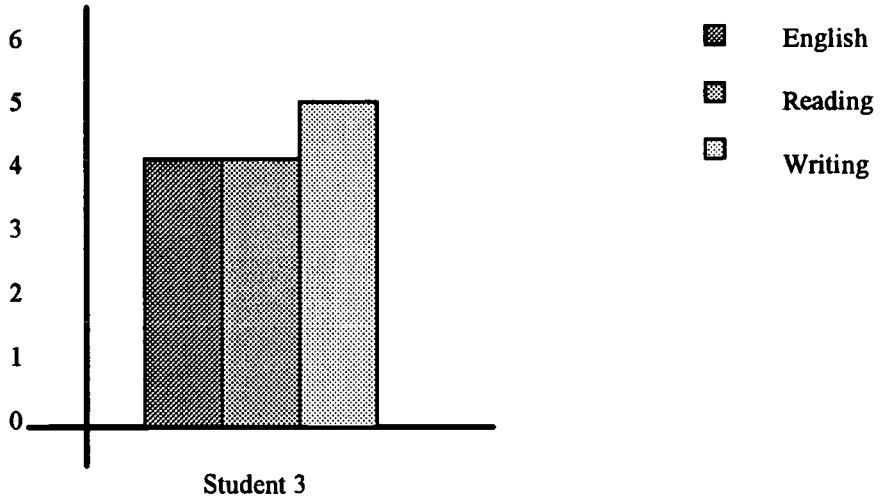
The lab requirement that first semester was pretty light. Basically, it consisted of getting the students set up on and learning how to use E-mail to ask about class assignments, and generally chat, and write class assignments on the word processor.

During the second semester, some minor but significant changes were made. The main objective, methodology, and course objectives stayed the same, but changes were made in the materials and labs of the class.

The original two students decided to take the class again. We changed the course number, and a third student joined the class. All interested students were given the placement exam again. The new student placed at an equivalent level as the others (*see Figure 4*).

The grammar workbook was changed to the next level of the series, GrammarWork 2, and News for You was continued, but the reader was dropped. In its place, students were given the opportunity to choose two books (approved by the instructor) they wanted to read. As they were reading the books, they had a set of questions to write "Reader Responses" to. The essay questions were given set due times in order to help the students judge their reading time better. In addition to these materials, I brought in extra work on idioms and other words taken from The ESL Teacher's Book of Lists. Also, most students bought Barron's Handbook of Commonly Used American Idioms, and we did some exercises using it. Much more writing was required of the students and a lot of practice was necessary to improve their reading ability.

Figure 4



The biggest change occurred in the lab part of the class. From the experience of the first semester, we discovered that the students did not know how or were apprehensive of using the computers. So, each student chose a free time when she and I could work together in the lab. Here we have worked on basic computer skills, using WordPerfect for Windows 6.1, and using E-mail. This has been a beneficial time for both the students and me. No interpreters were used in the labs.

The two semesters of this class have taught us a lot. As we move into the third semester we are looking at several changes that we feel would be beneficial to the students. One thing that we have learned is that the class will always be dynamic -- changing to accommodate the students' needs.

INTERPRETER'S PERSPECTIVE

As with any interpreting situation, the interpreter's first responsibility is to assess each deaf student's mode of communication. Each class may have students using a variety of preferred modes, from PSE to ASL. As the interpreter I use PSE, but do switch to ASL if there is some difficulty understanding placement of words or concepts related to the current topic of discussion. If the discussion is related to verbs and their endings, I will use some Manually Coded English (MCE) to differentiate between the "-s", "-ed", and "-ing" endings.

Interpreter Role

As interpreters, we are constantly reminding people who have no experience using interpreters of such things as "I'm here only to facilitate communication," "We can not express an opinion," or "No, I will not run down the hall and get you a cup of coffee." As a part of the team of the PEC English class, my role covers more than "facilitating communication." At the beginning of the class, it is explained to the students that my role is more than that of an interpreter in this class. I bring up issues that the teacher and students may not have recognized and actively participate in classroom discussions when achieving a clearer focus of the

material is necessary.

An advantage I have is the fact that the instructor has become well-versed in deafness, Deaf culture, and the syntax of ASL. She is able to interact with the students on a level that has more understanding than instructors in other classes. It is not necessary to discuss the Deafness and communication issues as is sometimes needed with other instructors. Advance preparation strengthened our working relationship. We are comfortable working together and depend upon one another for clear communication of the subject. An example of the advantage of being able to step out of my role as interpreter is when the instructor's explanation of material is not understood by the students. I can then ask the instructor to present that information in a different style, such as using the board. This allows the students to receive the information in a much more visible manner.

Conclusion

As we approach a new semester this fall, we are reviewing the past two classes and working on improvements for future classes. Our experiences this past year have been invaluable in helping us develop and progress. Perhaps the most rewarding experiences have been in our coming together as a team -- functioning as a unit to provide the students with the language skills they need to succeed in their college courses. In a final note we would like to thank the PEC for their continued and valuable assistance. This class is a reality because of their support.

ERIC

Materials List

Breyer, P. P. (1995). GrammarWork 1: English Exercises in Context. 2nd edition. Englewood Cliffs, NJ: Prentice Hall Regents.

Breyer, P. P. (1996). GrammarWork 2: English Exercises in Context. 2nd edition. Upper Saddle River, NJ: Prentice Hall Regents.

English ALFA Placement Test. (1983). Houghton-Mifflin Co.

Kress, J. E. (1993). The ESL Teacher's Book of Lists. West Nyack, NY: The Center for Applied Research in Education.

Makkai, A. (Ed.) (1991). Barron's Handbook of Commonly Used American Idioms. 2nd edition. Hauppauge, NY: Barron's Education Inc.

News for You. A publication of New Reader's Press, publishing division of Laubach Literacy International.

Reading Placement Test. Developed by Faculty at the Intensive English Language Program, University of Arkansas at Little Rock, Little Rock, Arkansas.

Smith, W. (1992). The Eye of the Tiger. [retold by Margaret Tarner] Oxford: Heinemann.

Writing Placement Test. Developed by Faculty at the Intensive English Language Program, University of Arkansas at Little Rock, Little Rock, Arkansas.

ESL Tutor: Educational Software for Improving English Skills of Students Who Are Deaf*

Dave Zenk
DPI
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ESL Tutor is a set of educational software programs developed to help college students, who are deaf or hard of hearing, improve their English vocabulary and writing skills. The product was called *ESL Tutor* because there is general agreement among educators of the Deaf that learning English is often a second language acquisition experience for many deaf children especially if their primary language is ASL. It has been in use in California community colleges for more than 10 years. In 1992, DPI entered into an agreement with the author to expand the program for the Mac system as well as to re-write the PC version to add user safety features. These development tasks are now completed and DPI has been distributing the programs throughout the US and Canada for about a year.

There are three independent programs in *ESL Tutor*. They are available as individual. The programs provide vocabulary training and contain exercises to improve writing. The Vocabulary Enrichment program contains more than 2200 words including English idioms. These words are defined using ASL gloss words. Parts of Speech includes a program to help deaf students understand and interpret English words that have multiple meanings. A group of 73 words having a total of 255 separate meanings is used. The exercises consist of:

1) Identifying the use of the word (its part of speech) in the sentence
2) Selecting the proper meaning of the word from a list of possible meanings based on their part of speech.

Finally, Grammar in Action is a program having of 530 short essays (paragraphs) which contain common writing errors. The student identifies the error and corrects it, proofreading the essay.

The first of these programs, Vocabulary Enrichment, contains more than 2200 words on 10 disks or modules. The program organization is described in figure 1 - *Outline for Vocabulary Enrichment*. Figure 2 - *Overview, Vocabulary Enrichment* shows the 10 modules divided into two groups - modules A through D and E through J. Figure 2 also describes the relationship of the lessons to the individual modules (the first four modules, A-D, have five lessons and the last 6, E-J, have three). A free demonstration disk of these programs is available from DPI (and was used in this presentation to illustrate the different features of the programs).

* This presentation was made in June, 1994 in Atlanta, Georgia at *Tools for Language: Deaf Students at the Postsecondary Level*, a PEC-sponsored mini-conference.

A major feature of Vocabulary Enrichment is that it provides out-of-class time exercises for students to practice their vocabulary. A second feature is that it has a "look and feel" that is appropriate to an adult user. Much of the educational software available today is written for younger children and many adult users may be put off by this. A third feature is that it is "results oriented" -- the student must learn the material to progress. Over the past ten years, the author gave pre and post tests (samples are included with the documentation of the program) to his students. Students who took these tests usually had comprehension in a range of 10-15% on the pre-tests and this improved to 90-95% on the post test after the student used this program. Regular follow-up with random groups of previously studied words helps ensure retention of the material.

The second program, Parts of Speech, is shown in *Overview, Parts of Speech*, figure 3. Figure 3 also includes a list of the words used in the demo disk. This program deals with the subject of multiple meaning English words like "back", "draw" and "just". Seventy three words of this type were chosen having a total of 255 different meanings. These words are also contained in module F of the vocabulary enrichment program so if the school has access to this program, the students may already be familiar with the meanings of the words. However the objective of this program is to give students practice with the strategy of finding the specific meaning for an English word with multiple meanings based on the way it is used in a sentence - its part of speech.

The Parts of Speech program does not *teach* the various parts of speech of English. But is does provide exercises that will support this classroom training in an out-of-class time environment that is stimulating for the students.

The third program, Grammar in Action, is discussed in *Overview, Grammar in Action*, figure 4. This program provides practice exercises consisting of short essays or paragraphs containing English writing errors common to deaf students as well as other ESL students. The student proofreads these essays, identifying the errors and correcting them.

There are four types of errors used in the program. "Articles" and "Verbs" have 175 essays each and "Word Choice" and "Suffixes" have 60 essays apiece. The fifth segment, "Combinations" contains a mixture of the above four errors in each essay. There are 60 of these essays as well for a total of 530.

Both "Articles" and "Verbs" contain rules which will appear on the screen when the student makes a mistake in correcting the error. These rules are included in the documentation as well as a list of suffixes and word choices contained in the program. A major objective of this program is to teach the students that proofreading their work is both essential and perfectly acceptable.

A demonstration disk containing examples for each of the above three programs is available from DPI at no charge. Both the PC (DOS) and the Mac platforms are supported. DPI is a California non-profit corporation with the mission to recruit, train and employ people with disabilities as computer professionals. Established in 1980, DPI has more than 250 people today.

The training program (DPI's mission) consists of two parts: a formal in-class education component and a work experience component in which the student participates in actual client related work supervised by DPI employees. In almost every instance, a job for the student results.

ESL Tutor offers an advantage to the mission of DPI by:

1) Providing a very effective work experience assignment for our students
2) Giving us the potential for jobs for the graduates of our program
3) Providing a product that serves the needs of the population of people with hearing loss

Figure 1

Outline: Vocabulary Enrichment

(Ten Modules)

	Type of Vocabulary	# of Words	Comments
Module A	General Vocabulary	225 words	1 word meanings
Module B	General Vocabulary	225 words	1 word meanings
Module C	General Vocabulary	225 words	2 word meanings
Module D	General Vocabulary	225 words	2 word meanings
Module E	General Vocabulary	225 words	3 to 5-word meanings
Module F	Multi-Meaning Vocabulary	255 words	Covered in POS
Module G	Prefixes-Roots-Suffixes	150 words	Examples
Module H	Prefixes-Roots-Suffixes	225 words	Words
Module I	Idioms	225 words	1 or 2 word meanings
Module I	Idioms	225 words	3+ word meanings

Figure 2

Overview: Vocabulary Enrichment

Modules **Chapter Organization**	**A - D**	**E - J**
Lesson 1	3 groups of 5 words Study new word Give meaning (until correct) All 15 words Give meaning (until correct)	3 groups of 5 words Study new word Give meaning (until correct) All 15 words Give meaning (until correct)
Lesson 2	Fill in blanks with word bank (15 words) (until correct)	Practice Quiz Graded Not recorded
Lesson 3	Fill in blanks with word bank (15 words) (until correct)	Random Review Prior chapters
Lesson 4	Practice Quiz Graded Not recorded	None
Lesson 5	Random Review Prior chapters	None
Chapter test	Results recorded on disk Passing grade by teacher	Results recorded on disk Passing grade by teacher

Figure 3

Overview: Parts of Speech

Two lessons:

1 - How is the word used in the sentence?
2 - What does the word mean? (from several possible meanings)

Word list in demo disk:

Word	Meaning	Part of Speech
Back	Move to the rear	V.
Draw	Make happen	V.
Just	Exactly	Adv.
Draw	Get	V.
Run	Go through	V.
Back	Support	V.
Draw	Move	V.
Run	Spread color	V.
Back	Unpaid	Adj.
Draw	Close	V.
Just	Only	Adv.
Draw	Same score	N.
Run	Tear	N.
Just	Fair	Adj.
Run	Print	V.

Figure 4

Overview: Grammar in Action

Objectives:

Identify error in essay:

Correct the error

Types of errors:

Articles

Verbs

Word choice

Suffixes

Combinations of above

Teacher management control:

Easy to add or drop a student

Teacher selects sequence of essays

Student status and progress reports

Computer-Mediated Literacy Development in Deaf and Second Language Populations

Beth O. Carlson
St. Petersburg Junior College
Clearwater, Florida

Introduction

I think there will be a world market for maybe five computers.
-- Thomas Watson, chairman of IBM, 1943

Computers in the future may weigh no more than 1.5 tons.
-- Popular Mechanics, forecasting the relentless march of science, 1949

640K ought to be enough for anybody.
-- Bill Gates, 1981

What *can* be predicted with reasonable certainty in terms of the uses of technology in the future? One fact is indisputable: computer-mediated instruction is emerging as a viable technological tool in a variety of educational contexts from preschool to college and university levels. Particularly promising is the potential for literacy development in an environment conducive to collaborative work, meaningful goals and real-time audiences. The contexts of literacy instruction are undergoing crucial transformations, to allow for concurrent changes in the nature of texts, of communication, and, more specifically, of language. This electronic link between social contexts and community (Duin & Hansen, 1994), leads educators away from traditional curricular notions and challenges beliefs, values, and pedagogy. One of the pedagogical theories implicit in an integrated writing environment is collaborative, or "interactive," learning (Batson, 1988). Collaborative learning techniques allow students to read what others have written as it is being composed as well as after it is complete; the students "comment on, contribute to, learn from, and share texts as they work together" (Bertrum & Rubin, 1993, p. 19).

To realize the potential of technology in literacy education, it is necessary to articulate the objectives of literacy development. Educators attempting to implement an innovation typically face the complex challenge of meshing new ideas with well-established beliefs and practices. Thus, a definition of literacy that includes technology is laden with political, economic, and educational agendas because technology, as much as literacy, is filled with ideological conflicts, shaped by forces of economics, history, and politics (LeBlanc, 1994).

The application of technology for literacy education through electronic conferences allows students to use the tools of literacy to examine the power structure of society; the goal, says Cooper and Selfe (1990), is to change those structures so that disenfranchised groups might participate in political arenas. Literacy is a social technology. That is, literate communities develop varied social, linguistic and cognitive practices with texts.

As the definition and contexts of literacy development change to include technologies such as electronic networks for literacy instruction, it requires understanding and acceptance of the evolving process.

The term *computer mediated communication* is used to encompass the merging of computers and telecommunications technologies to support teaching and learning (Collins, 1995). Typical functions and users include:

> E-MAIL MESSAGES
> E-mail messages can be composed directly in the telecommunications program (on-line) or first written on a word processor (off-line) and then uploaded. E-mail messages generally take a few minutes to arrive. Since the recipient does not have to be on-line, but can read the messages at anytime later, e-mail is considered asynchronous.
>
> ASYNCHRONOUS CONFERENCING
> Asynchronous conferencing allows messages to be sent from one person to many people. Two types are discussion lists, where one e-mail message can simultaneously be sent to thousands of e-mail addresses, and bulletin boards, where the same message is posted in a central place to be accessed and read by many people.
>
> SYNCHRONOUS CONFERENCING
> With synchronous conferencing, messages are sent instantly between one person and a group of people who are all on-line together. In educational settings, this often takes place in a classroom or laboratory with networked computers, and can be referred to as electronic networks for interaction (ENFI, a term copyrighted by Gallaudet University). Synchronous conferencing can also occur at a distance, taking advantage of telecommunications resources such as Internet Relay (IRC) or MOOS (virtual environments on the Internet for text-based discussion and simulation).
>
> FILE SHARING
> Both asynchronous and synchronous conferencing usually include some form of file sharing, which allows for paperless transfer of documents between individuals or within a group. This facilitates peer editing and collaborative writing (Warschaur, Turbee, & Roberts, 1994, p. 2).

Computer mediated communication (CMC) promotes self-discipline and requires students to take more responsibility for their learning. The nature of the text transfer and file sharing requires--if not demands --participation. In addition, an important aspect of CMC use in instruction is that it is text-based. Facility in writing is essential across the entire curriculum; one cannot communicate on a computer network without writing. Because CMC is, at present, primarily text-only, the consequent reduction in social cues leads to "protective ignorance" surrounding a person's social roles, rank, and status (Collins & Berge, 1995). For this reason, it is particularly suited to equality of voice in communicative activities.

If language learning is facilitated by interaction, i.e., the give and take of information about shared topics, negotiation for meaning, expansion of propositions, repetition, and clarifications that occur in any conversation (Batson & Peyton, 1986), then an environment rich in communicative practice, where students make and negotiate meaning through text writing, should foster linguistic proficiency and aid in the process of language acquisition for second language learners.

The medium of electronic communication breaks down barriers in ways that allow minority cultures, especially deaf populations, to participate fully in the discourse community. Computer-mediated classrooms present enhanced opportunities for effective instruction in process writing, critical reading and analysis, and purposeful communication techniques, in addition to developing competency in the use of technology and writing across the curriculum (Bertram, Peyton & Batson, 1993). As the locus of communicative control in the classroom shifts from teacher-directed to student-directed, students become empowered. English, therefore, becomes alive and vital as it is used in meaningful and comprehensible ways to achieve shared goals.

The use of CMC to teach writing, thus, holds great promise for a number of reasons, according to Day and Batson (1995): writing is more easily demonstrated; writing tasks are more realistic; writing occurs for an established audience; writing practice is easily encouraged; collaborative opportunities are created; the lag time between classroom discussion and student writing is reduced; and conversations are not limited or unequal. Everyone has access to the "floor" at the same time which can lead to conflict or "flaming." However, as Gruber notes (1995) a classroom that provides students with a means for authentic thought will not suppress different opinions; instead, students' differences will be valued and their ideas will become a means for exploring issues important to a liberating classroom. When used critically, CMC can enhance that goal by providing a space for students to raise issues connected to class discussions. It can also provide insights into different backgrounds and look at the social, political, and economic implications connected to classroom approaches. These situations call for what Gruber (1995, p. 76) labels "discussion of the conflict solution" where "different personalities in the classroom; conflicting political viewpoints; varying racial, economic, and social background; and gender and differences in sexual preference are likely to cause tension that allows for open discussions and critical discourse."

The purpose of this research is to investigate the use of the Daedalus Integrated Writing Environment (DIWE) as an interactive instructional medium in deaf and second language classrooms in an effort to determine whether student-directed discussions of writing foster intellectual community. In addition, the students' relative knowledge and growth of certain problematic syntactical features will be explored as a possible predictor of increased English proficiency.

Two research questions are implicit at the outset:

1. What is the effect of "situated context," or a context where students write, interpret, and negotiate texts via computer networks, on the overall literacy development of post-secondary deaf students using Electronic Networks for Instruction (ENFI)? The areas of focus should include: social construction and interaction; situated literacy; distribution of power; and accessibility (Duin & Hansen, 1994).

2. What is the role of input and interaction on the acquisition of English syntactical structures in a networked-based classroom? The area of focus should include specific attention to how interlocutor interaction affects grammatical development during the process of negotiating text.

Rationale

The over-riding concern in deaf education has always, of necessity, been basic literacy: how to help students who have lost their hearing early in life, and therefore have had little exposure to English, to acquire a level of written English proficiency that approximates that of their hearing peers (Batson & Peyton, 1986). As Batson and Peyton suggest, serious efforts to develop a naturalistic use of English have reflected multifarious communication approaches--speechreading, audio-loops, teletype (TDD) machines, overhead projectors, signed English, Signing Exact English, English fingerspelling (the Rochester method), Cued Speech, the Autocuer (eyeglasses with signaling mirrors), and Real-Time Captioning. However, the Commission on Education of the Deaf (established by the Education of the Deaf Act, 1986) concludes that some 175 years of research on the teaching of English literacy to deaf children have been, "remarkably unproductive: deaf students still are graduated from high schools coast to coast with third- or fourth-grade reading achievement scores" (Bowe, 1991, p. 13). Many communication methods have been tried over the years with little notable impact. The real problem that deaf students face is not a lack of hearing but rather a limited exposure to English.

Why are their reading levels at roughly the third or fourth grade? Predicting the language proficiency of deaf children is complicated. A number of factors such as home language, degree of hearing loss, age at onset of hearing loss, whether either or both parents are hearing or deaf, and educational background can make enormous differences in both American Sign Language (ASL) and English language proficiency. Bochner and Albertini (1988) note that only ten percent of 18 years olds read above the eighth grade level. In addition, on writing and grammar tests, deaf subjects manifest a variety of problems with English, including using shorter sentences with few conjoined and subordinate clauses; reiterating words and phrases within discourse; using more articles and nouns and fewer adverbs and conjunctions; and showing verb tense and agreement errors and the misuse of function words.

Another problem associated with predicting the language proficiency of deaf children is that it is often difficult to define "native" language for deaf individuals. According to Quigley and Paul (1984), many of the 75% of deaf American adults who use American Sign Language (ASL) regard ASL as their native language. Yet, as Quigley and Paul point out, since only 3 or 4% of deaf children are born to two deaf parents and fewer than 10% have one deaf parent, only a small percentage of deaf children really acquire ASL naturally in infancy and early childhood. "Therefore, the deaf individual's linguistic behavior can be understood in terms of delayed L1 development and in terms of a continual, less naturalistic L2 development. . ." (Berent, 1988, p. 134). Under these circumstances, as Berent postulates, we might be tempted to speak of this situation as "L1.5 acquisition."

While the reasons for this are extensively hypothesized, heavily debated, and unquestionably merit consideration, it is not within the scope of this current paper to go into such depth. It is sufficient to suggest that one line of thinking that might lead us closer to answering the perplexing and critical question is that the

view of deafness and the challenges that deaf children, their parents, and their teachers face, requires reconceptualization (Erting, 1992).

While it is true that deaf children can't hear, it is more important to emphasize that they do see. It is through seeing that deaf people have created a visual language and a visual culture. Deaf children are different, not deficient. Their access to the world and, thus language and education, is achieved primarily through vision. As Erting (1992) states:

> While a deaf individual may choose whether or not to be an active participant in the Deaf community, that deaf person can not choose to hear -- no amount of practice, hard work, or desire will transform that person into an individual who uses hearing in a primary way as vision. It is our task as educators to create a linguistic and learning environment that is fully accessible to the child, rather than expect the child to communicate and learn in ways that are physiologically impossible. . . . we in the educational establishment have not yet created such environments for deaf children, and if we were to do so, we would begin to see significant improvement in literacy skills (p. 103).

Several researchers have established clear connections between an accessible learning environment and literacy. Vygotsky (1978) in particular has emphasized the role of social interaction in the individuals spoken and written language development. Vygotsky contends that written language is intimately related to spoken language, both being a socially-situated and developmentally continuous process. As Erting states, "We must make spoken language accessible. . . through print, but by relating it to their way of seeing and to their way of communicating" (1992, p. 99). The basic premise is that teachers and children need to converse. Research into the role of input and interaction and the negotiation of meaning in second language acquisition (Braidi, 1995; Pica, 1994) offers rich insights for those attempting to understand literacy development in individuals who are deaf or second language learners. As Albertini (1993) asserts in relation to developing critical literacy:

> Recalling and reflecting on past experiences establishes a basis for the student to read critically. Meaning is created by the reader in interacting with a text, by the writer in retrieving experience and committing a perspective to a paper. . . For the critical theorist, a role of the reading/writing teacher is to help the student uncover the relationship between knowledge and power in society (pp. 62-63).

Albertini suggests that teachers encourage writing as a tool to shape critical interpretation of experiences. For this to happen it is necessary to reexamine assumptions about writing and literacy that pervade educational practice and shift from complete emphasis on functional and cultural literacy to allow for critical literacy development. CMC use is based on a sound pedagogy that affords learners the opportunity to react critically with meaningful text in real-time audiences where they can explore their individualism in a rapidly expanding information age.

Tina, a deaf student in a postsecondary Developmental English class, aptly describes the difficulties deaf children experience in learning English:

> Children who are born with hearing can that hear from their parents all the time. Children with hearing loss is that they couldn't get the language unless if their parents knew some

> signs for the hearing loss. Hearing impaired children without their parents knowing sign language that cause their education fall behind than hearing children. They used ASL because there is only one way they can communicate - through their hands. ASL is kind of mix language, not a follow the rule like English language. It use by the body and facial movement. This is why most deaf people use ASL instead English because English is very difficult language - primary language.

Deaf students seeking admission to postsecondary settings generally begin their studies with a significant educational handicap, and unfortunately, a high number of these students will drop out. Although there are a number of variables that mitigate their lack of integration into the social and academic systems of the institution (Nash, 1992), the most notable are their communication and academic achievement skills. Deaf students need to master the intricacies of standard academic English, and absorb information from English language materials that for many are still beyond their levels of syntactical knowledge (Berent, 1994). This is a most complicated task even under favorable conditions. At a very minimum, college students are expected by their instructors to use grammar, punctuation, and spelling correctly; to organize their text topics clearly; to present their arguments cogently; and to alter their style skillfully to meet the needs of their audiences. For many reasons, then, success in college is dependent on success in English (Anderson, 1993).

In a literate society, learning is the process of constructing necessary linguistic meaning from text. That deaf students have difficulty with English syntax and, therefore, reading is a well documented phenomena (Quigley & King, 1980). Because of their slow rate of syntactic development, many deaf students are not able to read the very material from which they are supposed to learn. As Lang and Lang (1992) state:

> Content mastery of particular subjects, while important, is not the only consideration in current work. The interaction between the learner and the world is receiving increasing scrutiny; for such interaction is critical in the formation of identity. We can see a growing tension that exists between the self and the world, and between a student's self and others; achieving such understanding may be a primary task in the postsecondary years. While pursuing mastery of academic content and professional goals in postsecondary programs, the young deaf adult must simultaneously seek knowledge about power, people, and culture (pp. 67-69).

An additional concern noted by these authors is that at the postsecondary level, many deaf students are bilingual in sign and a written/spoken language. Lang and Lang (1992 p. 69) raise the questions: "How does that bilingualism shape and sort their world and others' being in the world with them? How do deaf students gain access to professional language, and participate visually in the language of 'the system' ?"

Innovation is necessary in order to usher in change in the way we provide instruction for deaf individuals in academic settings. In the area of writing, the view of computers as an empowering force has been especially strong since computers can be used to foster membership in a community. Deaf and second language learners must be seen as agents of change in the struggle for intellectual voice among marginalized learners. According to the Commission on Education of the Deaf (1988), "Perhaps the single most hopeful

prospect for achieving quantum leaps in progress for persons who are deaf lies with technology, much of it computer based."

Computer-mediated communication (CMC) or interactive networks, though largely an untapped resource in classrooms for the deaf, hold great promise for the delivery of instruction in English and other content areas (Stuckless & Carroll, 1994). Addressing the Educational Applications of Technology for Deaf Students symposium, Davila (1994) states that:

> Because the availability of well-designed technology is so critical in the empowerment process, each of us needs to be sensitive to ways in which we contribute to, detract from, this process. Because we hold within our hands so valuable a component of the process, we must always keep at the forefront of our minds the true purpose for utilizing our skills: creating an environment in which deaf individuals can make informed decisions for themselves, communicate for themselves, project themselves, and relate effectively with others. Without innovative technology, these activities would be very difficult for some deaf individuals and impossible for many. But we must never forget that this process is a means to an end: the empowerment of deaf and hard of hearing people (p. 9).

This present study is motivated by the need to create accessible learning environments that will encourage unrestricted freedom of expression for students who will then be able to communicate in ways that are accepted and understood by everyone. When deaf students respond to education in positive ways that reflect a developing interaction with English, the acquisition process is enhanced.

A brief description follows of the Daedalus Integrated Writing Environment which is the interactive learning network used in the present study. This study focuses on postsecondary students who are deaf and learning English as a second language while using the Daedalus Integrated Writing Environment (DIWE).

THE INSTRUCTIONAL CONTEXT

What is DIWE?

Daedalus is a piece of software that defines the computer as a part of a network, a set of computers linked together in a Local Area Network, or LAN, so they can share information stored on a fileserver. DIWE defines the computer network itself as a medium for teaching and learning by means of (often interactive) written discourse.

DIWE itself is a collection of interacting components which allows instructors to post instructions and other messages to students in a file that they can view at any time. WRITE is a simple word processor. INVENT, an invention heuristic that students can use in choosing, exploring, and focusing topics for their essays, has its counterpart in RESPOND, which guides peer reviewers in critiquing draft essays. MAIL is an electronic mail system which can be used as a combination bulletin board, social invention aid, peer review system, and classroom management tool. INTERCHANGE allows the users to conduct intensive, far-ranging class discussions live or in "real time" over the network. All of these are available from a single menu. There

are also a number of tools, available under a separate menu, which allow students and instructors to keep track of their work, and copy files to the right folders (The Daedalus Group, 1993).

Theory Behind DIWE

The Daedalus Integrated Writing Environment is based on the pedagogical theory of collaborative, or "interactive" learning and uses techniques that create a student-centered learning environment which encourages and enhances language use through social interaction. Whichever program is used, the basic assumption of research on computer writing networks has been that students will benefit from collaborative writing (Bump, 1990).

Collaborative writing development espoused by Bruffee (1984) calls on individuals to view writing as an activity that can be enhanced by working in and with a group of other writers. It encourages, perhaps even demands, student engagement. Students become active creators and users of knowledge, rather than passive receivers. Collaborative learning allows for practicing of previously presented skills and concepts. It allows students to attempt to create personal knowledge through negotiation (language) during social interaction. In practice, however, learning to write with others is difficult. In the traditional writing classroom, time constraints and routines are counterproductive of collaboration (Hartman, et al. 1995).

According to Hartman, et al. (1995), the technology of computer mediated interaction is entirely devoted to letting people communicate with one another, and the characteristics that make it as such are uniquely suited to increasing interaction and to expediting collaboration. As Kern (1995, p. 459) states, "Thus the normal pattern of classroom discourse, consisting of a teacher-initiated topic, student reply, and teacher evaluation" is reduced in favor of student initiated control of the shared discourse.

Guidelines for Classroom Management

When accountability for learning is shifted from the instructor to the student, it is necessary for the instructor to redefine his or her role in order to create activities that will foster communal ethos. Intellectual and social frameworks within which the class's negotiation for understanding takes place must be well structured. The instructor must plan ahead for the purpose of the activity and consider which components of the Daedalus environment are well suited to the goals of the particular lesson. It will also be necessary to practice manipulating texts within the system, making use of the mechanics in relation to the writing task, which should be tackled in discrete tasks which build upon one another. Class assignments should be posted before each lesson begins. They should be structured in such a way as to allow students to proceed as soon as they log on and to work at their own pace.

Sample Lessons

Following are two sample screen lessons previously used in the DIWE classroom. The nature of the lessons allows students to proceed at their own pace.

Assignment October 7

1. Go to ACTIVITY and select NEW WRITE WINDOW. Type your dialogue journal response to the question, "If you were in the video ASL - PAH!, what would you say about yourself?" When you have finished save it to your disk.

2. After you have completed number one, go to UTILITIES and select TURN IN A DOCUMENT. Turn in your composition.

3. Respond to MAIL.

Assignment October 14

1. If you have not already completed the assignment from October 7, do so now.

2. If you have completed the 10/7 assignment, go to ACTIVITY in the menu and select NEW WRITE WINDOW. Type five of your sentences from the homework (10/13). When you have finished, go to FILE, save your work on your disk and then print it.

3. When you have finished 1&2, read "Deaf parents are happy when their baby is born deaf" (see me for a copy). What do you think the author means by the statement that, "It's not, however, the hearing loss that puts people in the deaf culture; it is how they identify themselves." ? Go to INTERCHANGE under ACTIVITY and discuss your answers.

4. Respond to any MAIL.

Note: The theory behind the consistent use of dialogue journals as tools that can be used to promote sense of audience, as well as an awareness of turn-taking, questioning, answering, commenting, and initiating - skills which are more than basic "grammar" in successful communication (Bailes, C., et al. 1986; Cannon & Polio, 1989) is applied to the electronic mail and Interchange portions of DIWE. The transcripts from these portions should reflect similar patterns.

A particular problem that occurs in deaf classes is the use of "Telecommunication Devices for the Deaf (TDD) language", such as, "BEC" for because or "SK, SK" for signing off or "(smile)" and "u" for you. This is a natural outgrowth of the expression of keyed text for these individuals; it is perhaps possible that this could be considered parallel to the "medium specific" conventions such as smiles [:-)], frowns [ ):-( ], or winks [;-)] used to compensate for the absence of prosodic and paralinguistic features found in face-to-face oral communication (Kern, 1995). It is generally requested that students keep this at a minimum in their expression of English text on the network. It must also be agreed upon prior to the outset that all language will be the student's approximation of written English and will be an attempt to conform to the shared goals. The following brief excerpt of an *Interchange* session demonstrates not only the dynamic student-to-student interaction, but also the potential for liberated discussion. In response to the prompt, "How do you feel that you have changed since leaving high school?", the discussion included:

Fara: *John try to think positive about your goal and life. You'll learning something a lot from school. Have a great weekend (smile).*

Robert: *Oh, hi Fara.*

Fara: *Robert Big Hello to u and have a great weekend and see u on Monday or whatever. Good-bye. Sksk*

Phillip: *I am feel same personality. I feel different some change my life what kind point change is no more dorm houseparent responsible for me and also time wake up and now I am responsible for wake time and bills and go to school for start time class that's life!.*

John: *I feel clumsy and I try my best if I can do it I can show you prove that I can do it and don't give up.*

John: *Now I am college student no more high school.*

Pedagogical considerations concerning the character of the networked interactions (Peyton & Horowitz 1988; Collins, 1988) such as side conversations, off-topic conversations, or missed conversations because the student is concentrating on typing a message, the tendency to make hasty conversations in order to keep up with the communications, "playing around," or use of "bad language" become less of a problem when students perceive the network to benefit their language growth and efforts to express themselves intellectually in relation to the group.

An additional necessity for the instructor is to have a back-up plan. All systems fail from time to time and frustration invariably accompanies the use of technology. It is best to have an alternative activity that can be quickly shifted to should Daedalus fail to operate properly - which it will.

METHOD

Subjects

Seventeen profoundly deaf individuals (90dB PTA +/- 10) in two separate classroom levels (ENC 0009/ENC 0019, Developmental English I/II; and ENC 1152, Communications II) participated in this study. Students were placed in these sections based on their performance on the Stanford Achievement Test for the Hearing Impaired (scores are transferred from their high schools), the Test of Adult Basic Education (TABE), which is an entrance requirement, and a writing sample. Actual cut-off scores vary with the population each session.

At the start of the session, students were instructed in the process of logging on/off and "pulling up" work from Daedalus. This was done using the file server and a large screen projection device to minimize visual disturbances that occur trying to instruct students in the lab. Approximately two 40 minute sessions of instruction occurred.

The students met in the computer lab one to two days per week during regular class time to work on the Daedalus Integrated Writing Environment (DIWE). When students were not in the lab, they received regular classroom instruction at their respective levels.

Instrumentation

Students first completed student information sheets to survey prior knowledge and establish demographic data (see Appendix A). This was an area suggested by O'Connor, et al. (1989) in a previous study that examined the effect of ENFI and non-ENFI environments on students' passing rate on the Writing sections of the *English Placement Test (EPT)* which is given at Gallaudet when a student enters the program and at the end of each semester thereafter. Subsequent work by Mary Fowles (1993) also addressed this issue. Then, Developmental English students were pre-tested (and later post-tested) using the *RTAS, Revised Test of the Ability to Subordinate, form A* (Berent, 1988).

Berent (1988) revised the *Test of Ability to Subordinate* (Davidson, 1978) with permission from the author, by changing the sentence-combining task to a multiple choice version. He also created a second version (form B) which was used as a post-test for this research. In assessing the syntactic levels of college-level deaf students, Berent was interested in establishing orders of difficulty among nine *RTAS* English structures and explaining these orders within the framework of current linguistic theory. The *TAS* was designed to assess the ability of college-level intermediate and advanced ESL students to control the following nine embedded syntactic structures in English: 1) prenominal adjectives, 2) adverbs, 3) prepositional phrases, 4) infinitive phrases, 7) adverbial clauses, 8) relative clauses, and 9) noun clauses. It is a 45-item pencil-and-paper test containing five tokens of each of the nine target structures; it employs a sentence combining, fill-in-the-blank format.

In order to target students with reading difficulties in the Developmental English class, a general reading measure was obtained using the *Nelson Denny Reading Test* (comprehension portion), form G, Copyright 1993. Noting reading scores was relevant for the Developmental English level students as these students are required to comfortably perform a variety of reading tasks on the network. This has been identified as a potential problem with use of *Interchange* in "slow readers" (Hughes, 1994). The rapid pace of the text can place a considerable burden on students with additional reading problems. Students in the upper level courses were not targeted for potential reading difficulty during the course of this study; it was determined, based on their placement, that those students would demonstrate more advanced textual skills.

Data Collection and Analysis

Initial writing samples were reviewed and scored holistically by three professionals familiar with the writing of students who are deaf using the *Test of Written English (TWE) Scoring Guide* (see Appendix B), Copyright 1986, 1990 by Educational Testing Service.

In addition, a portfolio approach was adopted that reflected shared goals and experiences. Fowles (1993) includes an extensive discussion regarding assessment and the design of a portfolio program for ENFI environments in Network-Based Classrooms. Students selected a final writing to compare to their earlier submitted writing. Students were prompted to compare their writing on the basis of global and local occurrences in their writings and on the process of personal growth. Periodic reflections about the process were also informally monitored through the electronic mail portion of DIWE, and formally by way of an adapted questionnaire (Kern, 1995).

Students were pre-tested and post-tested using the *RTAS* which was then analyzed to determine if the findings were consistent with Berent's (1988) results. His testing revealed that, generally, the deaf college students were most successful on structures that exhibit subject-verb-object word order and in which those grammatical relations are explicitly represented.

In addition, transcripts were analyzed for grammatical trends in input language and interaction while looking specifically for patterns in social interaction that suggest increasing sophistication in usage. The overall quality of the student text was also noted.

Results and Discussion

In response to the survey on prior knowledge and demographic data (refer to Appendix A), the following breakdown was established:

Age:	17-19 = 24%	20-21 = 35%	22-30 = 29%	31-40 = 12%
Gender:	Male = 59%	Female = 41%		
Ethnicity:	White = 59%	African American = 6%		
	Hispanic = 29%	Asian American = 6%		
Language spoken in the home:				
	English = 70%	Spanish = 24%	Thai = 6%	
Language preferred:				
	English only = 12%	ASL/English = 70%		
	Spanish/ASL = 12%	ASL/Thai = 6%		
Experienced with word processing:				
	Fairly well = 29%	A little = 36%	No = 35%	
Experienced with DIWE:				
	First session = 35%	Second session = 65%		

It was expected that students with more experience using DIWE would be able to log on and get to the tasks more quickly. By the end of the session, however, most of the students were able to get to their assignments with relative ease.

The results of the pre/post test on the *RTAS* yielded the following:

RTAS PRE/POST TESTS RESULTS

Table 1 Percentages of Correct Responses, Overall and by Group on the Nine Structures of the *Revised Test Of Ability to Subordinate*

Pre-Test

Structure	*Overall*	*Level I/II*	*Level III*
Prenominal adjectives	56%	46%	66%
Adverbs	49%	34%	63%
Prepositional phrases	61%	44%	77%
Infinitive phrases	34%	18%	49%
Participial phrases	24%	10%	37%
Gerund phrases	31%	8%	54%
Adverbial clauses	64%	56%	72%
Relative clauses	47%	5%	88%
Noun clauses	39%	20%	57%

A comparison of the level I/II combined class and the level III class reveals that performance on most structures gradually improves as the level of proficiency rises. A difference between the two groups of 20% or more occurs on all structures on the pretest, except adverbial clauses. The largest difference (83%) occurs in relative clauses. If 80% is considered mastery, then level III appears to have mastered relative clauses on the pre-test at 88%.

Level I/II students had most success with adverbial clauses, prenominal adjectives, prepositional phrases, adverbs, and noun clauses, and the least success with relative clauses, gerund phrases, participial phrases, and infinitive phrases. Level III students had more success with relative clauses, prepositional phrases, adverbial clauses, prenominal adjectives, and adverbs, and the least success with participial phrases, infinitive phrases, gerund phrases, and noun clauses.

Post-test results yielded an overall increase on prenominal adjectives, adverbs, prepositional phrases, infinitive phrases, participial phrases, gerund phrases, and adverbial clauses of 9.14% while relative clauses and noun clauses decreased by 8.5%. According to Berent (1988) relative clauses violate basic NV(N) constituency and therefore interfere with the deaf learner's assignment of the basic grammatical relations of subject, verb, and object. He noted this structure as problematical on his initial testing with the *RTAS* as well. Accordingly each proficiency level handled relative clauses slightly differently.

In both classes, general writing samples were reviewed by two other professionals familiar with deaf student writing at the start of the session and scored using the *Test of Written Language* (1987) scoring guide (see appendix B). These were then included in the students' portfolios as were other writing samples which were scored holistically. A comparison of the average initial essay score and the final essay scores yielded gains in

the ability to address the writing topic, organize and develop the supporting detail and approximate appropriate syntax and usage. Lexical gains were also observed.

Table 2 Percentages of Correct Responses, Overall and by Group on the Nine Structures of the *Revised Test of Ability to Subordinate*

Post-Test

Structure	*Overall*	*Level I/II*	*Level III*
Prenominal adjectives	57%	50%	83%
Adverbs	63%	38%	68%
Prepositional phrases	69%	47%	83%
Infinitive phrases	47%	28%	52%
Participial phrases	29%	12%	46%
Gerund phrases	45%	15%	51%
Adverbial clauses	73%	58%	83%
Relative clauses	36%	12%	60%
Noun clauses	33%	25%	52%

In response to the question students were asked regarding the process of learning English using DIWE, a number of responses were recorded. Two examples follow:

One student expressed a concern early in the session that is common with the students:

> Well, I like to learn about this computer yes but I don't want to waste time. But I really interest in the computer.

Often students fear that they are using valuable class time for what seems like play. This feeling usually subsides once the students realize how much work they actually do in networked writing. Another student below seems to express some frustration in learning the system.

> I'm doing okay... still learn with this computer stuff.

While yet another student has much praise for the method of learning.

> Well, I like this because I learn how to improve my English language. I like to give people feedback. Bueno me gusta mejorar my lenguaje de ingles, escribir las palabras, me siento muy bien en usar la computadora por que me ayuda, en como mejorar. Espero que puedas entender. Te queremos mucho.

The above example was given by a student who felt more comfortable in her native language of Spanish to express her written feedback.

Responses to the student questionnaire are reported in Appendix C. Overall students felt the use of DIWE was a positive experience, they found the small group discussions helpful, they were comfortable with the way assignments were written, and they felt that the time was well spent. Most interesting was the

realization that not only the best students talked the most (#9). While 54% strongly agreed or agreed, 36% were neutral or disagreed. In terms of anxiety over the use of English (#10), 45% disagreed or strongly disagreed that this was a problem for them on the network. This was one area of particular concern.

Sample dialogues from *Interchange* sessions were reviewed for examples of student effort to achieve comprehensibility of message meaning as they negotiated by working linguistically in order to achieve that needed comprehensibility. Pica (1994) suggests that instances where interlocutors engage in repeating a message verbatim, adjusting its syntax, changing its words, or modifying its form and meaning, are reflected in learner output and evolve in communicative settings. One particular *Interchange* session where students were asked to read a local newspaper article "Deaf Parents Are Happy When Their Baby Is Born Deaf" (St. Petersburg Times, 10/11/94) and discuss what the author meant by the statement that "It's not, however, the hearing loss that puts people in the deaf culture; it is how they identify themselves" demonstrated clear examples of these factors of negotiation:

Chris: *Most hard of hearing like to be in the hearing world that's why they not like to be involves deaf cultures because we learning slowing and behind the news happens. Hearing people became hearing loss and they trying to be learning sign language but all people who are hard of hearing and hearing loss not using sign language. They prefer to use voice with hearing aid.*

Tom: *I think not. Most hard of hearing people like to be hearing world because I went to Gallaudet U. student, and I seen many hard of hearing people in my prep. group, and they love to joining deaf culture. Because they can feel their hard of hearing alike to be deaf and they knew that the deaf people are about same as hard of hearing people.*

Jean: *I am in the same story. It talk about hearing loss with hearing aid. They can talk by communication, but they don't get involved with deaf, but it harder for them use A.S.L. and socialized because raised with hearing family. I am in the both world. It better to deaf in own culture hard of hearing in the hearing world - they can talk.*

Chris: *I disagree this, but I am not discriminate your opinion. I always see hard of hearing like to be hearing so I always notice hearing people always desire to learn sign language when they meet deaf people.*

Phay: *Some hearing impaired people like to have hearing or deaf children as family. Most deaf people prefer to have deaf children like other hearing people have hearing children a family. I think why deaf people like to have deaf children as family is because they can communicate through sign language like other hearing family can communicate through voice. I understand why some hard of hearing don't identify with the deaf culture is because they never grew up in that kind of deaf culture, they grew up only in a hearing world. If I have some children, I don't care if they are deaf or hearing children, but I rather to have them to learn some sign so they can communicate with me.*

As Kern (1995) and Batson (1995) have also noted, examination of *Interchange* transcripts reveals a somewhat "chatty" nature of writing that students produce. Kern also suggested that while the discourse

generate during the *Interchange* session obviously shares certain aspects of written discourse - for example, its graphic form (which allows for deliberation and editing before messages are posted) - the preference for certain syntactical structures, and greater lexical density is also noticed.

Much of the *Interchange* discussion of the deaf students tended to be "metalinguistic" in nature. This feature was also noted by Kern (1995, p. 459) who posed the question: "Might it be that the written form of *Interchange* discussion enhances students' awareness of the features of their collaborative discourse by distancing them from it and allowing them to review visually the discourse to find patterns and progressions?"

An additional feature of negotiation occurred in the mail portion of DIWE where students' engaged in asynchronous adjusting of textual meaning in response to peer feedback. Some examples of the feedback follow:

Tom: *Jessica, I agreed with you about Ethics class. That course made us interest. Umm. . . I noticed when you typed in first sentence, it talked about present, right? But after that you talked about past, so please try to thinking about reader reading in your paragraph. He or she will think which you were talking about past or present or future, got it?*

Thanks, Tom...

Jessica: *Tom, I'm not sure what your wanted to know. I don't understand what you mean by asking me if this was present or past?? I think I understand but to answer your question, I wrote this before. It was old. It's not about present. If you have any questions, pls ask me.*

Jessica

An interesting note on this particular discussion was that the student switched back to read her own writing three times in a nine minute period, which can be tracked on the *Mail* portion of DIWE. Afterward, she re-read Tom's feedback before she commented on his statements. She was obviously searching for evidence of his claims.

Conclusions

One goal of this research was to establish a positive link between the use of the computer mediated networked language program, specifically DIWE, and increasing levels of linguistic sophistication in deaf college students. Trends are emerging in the electronic writing environment, but the systematic application of a planned course of action should increase the effectiveness of the outcomes of the network. Designing input that will challenge students but serve to enhance their acquisition of problematical English structures has always been difficult.

A secondary goal was to create in the students a desire to be connected to the discourse community, whether through electronic mail, on-line classrooms, or through the development of materials specific to deafness that can be shared world wide. The electronic word is a powerful medium for individuals in the

community of inquiry. Stigma associated with speech that is not normal may lead the student to shy away from dialogue. Only a receptive environment will solve this challenge.

The more deaf students participate and collaborate in the community of inquiry and develop self-direction, the sooner the stigma attached to the difference is lifted, self-confidence is nurtured, and the student's own goals and dreams are reached. One student's struggle to develop intellectual voice is reflected in an evaluative statement regarding her continuing process of acquiring English:

> I think that teacher is good performance to work with student by the English class because we learn new many discover of the language, group debates, homework, and hear new things for the lecture. But we are very patient to fight on the concept of our life to speak in the language for the writing and procedure of the education. For me, as I had been difficult to catch the lecture that make me feel increase solution of work that would keep continue many methods of grammar for situations that keep me confuse sometime.

Access to higher education is possible for deaf and second language learners when the barriers to academic language and social constructions are minimized and students are no longer marginalized in the community of academic inquiry. Electronic networks provide one means of reorganizing classrooms to situate literacy within the control of writers.

It is evident from this research that "situated context" where students write, interpret, and negotiate texts via computer networks positively influences the language learning of students who are deaf. While it is not a panacea for language acquisition, nor is it a substitute for normal classroom discussion, it *is* a viable means of creating social contexts and meaningful uses for language.

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Appendix A

Student Information Sheet for Beginning of Semester DIWE Students

Please provide the following information. All of this information will remain confidential and be used for group data only. No student will be singled out by name or ID number. Please use your name ONLY so you can be located at the end of the semester.

1. Date _____
2. Name _____
3. Student ID _____
4. Class (e.g. ENC 009/0019, ENC 1151, ENC 1152, etc.) _____
5. Age (optional)
   _____ 17 - 19 _____ 20 - 21 _____ 22 - 30 _____ 31 - 40 _____ 41 -
6. Gender
   _____ Male _____ Female
7. Ethnicity
   _____ White _____ Black _____ Native American
   _____ Hispanic _____ Asian American
8. Language spoken in the home _____ (please specify)
9. Language you feel most comfortable with _____ (please specify)
10. Please indicate your experiences with DIWE (using a computer network to communicate with the teacher and with other students)
    _____ This is my first session in a DIWE class
    _____ This is my second session in a DIWE class
    _____ I have had two DIWE classes before
    _____ I have had three or more DIWE classes before
11. Do you know how to use a word processor?
    _____ yes, fairly well
    _____ yes, a little
    _____ no
12. Do you use a word processor for your writing classes?
    _____ always
    _____ sometimes
    _____ never
13. When writing for your classes, do you compose with a pencil and paper before entering your text into the word processor?
    _____ always
    _____ sometimes
    _____ never
14. When writing for your classes, do you compose your essays directly at the word processor?
    _____ always
    _____ sometimes
    _____ never
15. How would you rate your overall typing ability?
    _____ I do not type at all
    _____ minimal (under 30 wpm)
    _____ average (30-60 wpm)
    _____ proficient (60 wpm)

Appendix B

Test of Written English (TWE) Scoring Guide

Readers will assign scores based on the following scoring guide. Though examinees are asked to write on a specific topic, parts of the topic may be treated by implication. Readers should focus on what the examinee does well.

Scores

6 **Demonstrates clear competence in writing on both the rhetorical and syntactic levels, though it may have occasional errors.**
A paper in this category
- –effectively addresses the writing task
- –is well organized and well developed
- –uses clearly appropriate details to support a thesis or illustrate ideas
- –displays consistent facility in the use of language
- –demonstrates syntactic variety and appropriate word choice

5 **Demonstrates competence in writing on both the rhetorical and syntactic levels, though it probably will have occasional errors.**
A paper in this category
- –may address some parts of the task more effectively than others
- –is generally well organized and developed
- –uses details to support a thesis or illustrate an idea
- –displays facility in the use of language
- –demonstrates some syntactic variety and range of vocabulary

4 **Demonstrates minimal competence in writing on both the rhetorical and syntactic levels.**
A paper in this category
- –addresses the writing topic adequately but may slight parts of the task
- –is adequately organized and developed
- –uses some details to support a thesis or illustrate an idea
- –demonstrates adequate but possibly inconsistent facility with syntax and usage
- –may contain some errors that occasionally obscure meaning

3 **Demonstrates some developing competence in writing, but it remains flawed on either the rhetorical or syntactic level, or both.**
A paper in this category may reveal one or more of the following weaknesses:
- –inadequate organization or development
- –inappropriate or insufficient details to support or illustrate generalizations
- –a noticeably inappropriate choice of words or word forms
- –an accumulation of errors in sentence structure and/or usage

2 **Suggests incompetence in writing.**
A paper in this category is seriously flawed by one of more of the following weaknesses:
- –serious disorganization or underdevelopment
- –little or no detail, or irrelevant specifics
- –serious and frequent errors in sentence structure or usage
- –serious problems with focus

1 **Demonstrates incompetence in writing**
A paper in this category
- –may be incoherent
- –may be undeveloped
- –may contain severe and persistent writing errors

Papers that reject the assignment or fail to address the question must be given to the table Leader. Papers that exhibit absolutely no response at all must also be given to the Table Leader.

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Appendix C

Student Questionnaire on DIWE

Please answer the following questions honestly. You do not need to write your name on this questionnaire.

Answer with one of the following:

(a) Strongly agree **(b) Agree** **(c) Neutral/No opinion**

(d) Disagree **(e) Strongly disagree**

1. DIWE was a positive addition to this class.
   a. 36% b. 55% c. .9% d. 0% e. 9%

2. The *Interchange* sessions were too short.
   a. 0% b. 36% c. 46% d. 9% e. 0%

3. Small group discussions on *Interchange* were the most helpful.
   a. 27% b. 55% c. 9% d. 9% e. 0%

4. The discussion topics were interesting.
   a. 18% b. 55% c. 27% d. 0% e. 0%

5. The way the assignments were written helped me to feel more comfortable in participating.
   a. 46% b. 55% c. 0% d. 0% e. 0%

6. The time we spent using *Interchange* would have been better spent in the classroom.
   a. 18% b. 9% c. 46% d. 18% e. 27%

7. The *Interchange* sessions changed the class discussion in a positive way.
   a. 18% b. 64% c. 18% d. 0% e. 0%

8. Most of the discussions were unimportant.
   a. 9% b. 0% c. 46% d. 18% e. 27%

9. Good computer skills were needed to participate in the discussions.
   a. 36% b. 18% c. 9% d. 0% e. 0%

10. Worry about writing in English kept me from participating.
    a. 0% b. 9% c. 46% d. 36% e. 9%

11. The instructor did not give enough feedback.
    a. 9% b. 18% c. 55% d. 9% e. 9%

12. Students were more honest on *Interchange* than they would be in regular class sessions.
    a. 18% b. 46% c. 18% d. 18% e. 0%

13. The *best* students talked the most on *Interchange* sessions.
    a. 36% b. 18% c. 18% d. 18% e. 0%

14. Knowing the *Interchange* program made it easier for me to participate.
a. 18% b. 55% c. 18% d. 9% e. 0%

15. It was difficult to read everything that everyone wrote.
a. 18% b. 18% c. 27% d. 18% e. 9%

16. The instructor should have given more guidance in the *Interchange* sessions.
a. 18% b. 64% c. 9% d. 0% e. 0%

17. DIWE was a welcome change from the usual class routine.
a. 27% b. 64% c. 9% d. 0% e. 0%

18. DIWE improved my ability to write in English.
a. 46% b. 46% c. 9% d. 0% e. 0%

19. DIWE improved my ability to read English.
a. 27% b. 64% c. 9% d. 0% e. 0%

20. DIWE improved my ability to discuss ideas in English.
a. 36% b. 36% c. 27% d. 0% e 0%

Supporting Science Teachers Through a National Network: The Access to English and Science Outreach Project (AESOP)

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The Access to English and Science Outreach Project (AESOP) pools the knowledge and expertise of high school science and language teachers, special education professionals, educational researchers, and university instructors. By sharing best practices and recent knowledge, instructional strategies are being tested that will raise deaf students' interest and achievement in science. To promote the use of best practices, this grant project, which is supported by the National Science Foundation and based at the National Technical Institute for the Deaf, begins with regional workshops. At the workshops, teachers focus on three areas that are crucial for deaf students studying science: self esteem, hands-on activities, and writing.

Self Esteem

Students--hearing or deaf, male or female--need positive self-esteem to succeed in school and in careers. Research clearly has shown greater achievement for students with positive self-esteem. Positive role models contribute to the development of self-esteem. Whatever their academic backgrounds, few teachers know of the significant contributions to science and technology made by deaf people: for example, that a chemical element, a comet, and numerous important scientific principles were discovered by deaf scientists. The fact that few deaf students know of these contributions, or even know a science teacher who is deaf, may contribute to their reluctance to consider scientific careers.

In the workshops, we present recently-published historical information on the contributions of deaf women and men to science and technology, and appropriate and stimulating ways to use this information in the classroom. Students are encouraged to read and write about well-known scientists like the inventor Thomas Edison and the rocket pioneer Konstantin Tsiolkovsky and lesser known scientists and researchers like the astronomer Annie Jump Cannon, and Donald Balantyne, a specialist in microsurgery. All were pioneers in their fields and most faced situational and attitudinal barriers because of their deafness. AESOP participants are also encouraged to contact living deaf scientists and invite them to their classrooms.

Hands-On Activities

Standard instructional delivery in science classrooms where there are deaf students is lecture and explanation. However, research has shown that deaf students who manipulate objects and are involved in

hands-on activities and related discussions, achieve higher scores on science content tests than those who do not. Many teachers report that simple, inexpensive demonstrations of scientific principles are "worth a thousand words" in a science class. In the AESOP workshops, we use empty pop bottles, paper cups, rulers, string and balloons to demonstrate learning activities that may easily be replicated by teachers and students. Both procedure and principle are emphasized. Students need to *DO* science to understand it. That is, they need to gather the materials and assemble the equipment whenever possible. They need to follow written instructions and write down procedures, observations and questions. By structuring the classroom so that students are involved in scientific procedure and by providing appropriate questions and the prompts for questions, the teacher sets the course for critical thinking about phenomena or perhaps discovering the scientific principle that is the object of the lesson.

Writing

Teachers of deaf students know that the language of science, especially its frequent use of structures like the passive voice and use of technical and semi-technical vocabulary is particularly challenging. These teachers know, and research has shown, that deaf students make hypotheses about the language similar to those made by other learners of English (for example, hearing students of English as a second language). They may not know that their students bring significant experience in functional and social writing to the classroom. They may not realize that their students have used writing (and their developing English language ability) as a tool for learning and communication outside of the classroom. Informal writing may be a powerful tool for teachers and students to use to learn the language of science and to reflect on key concepts.

Scientists use writing to comprehend scientific text, to record observations, to question, to report and to think about observed phenomena and key concepts. In the workshops, we demonstrate the use of "double-entries" (in a reading journal), note cards for generating questions and hypotheses, "vocabulary enhancement," that is, systematically adding technical and semi-technical terms to students' descriptions, and creative and reflective writing to learn science content.

Improving deaf students' access to the language and content of science and stimulating them to consider careers in science cannot be the responsibility of a single educator or field; such a change requires collaboration among professionals from different disciplines as well as with parents. This is why AESOP encourages cross-disciplinary teams in our efforts to identify and pilot "best practices."

The Network

Research has shown that innovative programs focusing on hands-on science activities are often sustained when teachers are enthusiastic and "claim ownership of the programs" (Kyle, 1985). Another goal of the workshops is to provide an opportunity for teachers to share their own best practices (strategies) with others and to begin designing an instructional unit that will make use of these strategies to teach a selected science

principle. A regional workshop also represents the beginning of a local network of teachers focused on the teaching of science to high school students who are deaf. Following the workshop, the network expands for these participants as university instructors and researchers with experience in teaching deaf students make themselves available to consult on the design of instructional units. Strategies, designs, problems, and progress are shared with the teachers in the national network through the AESOP newsletter and a World Wide Web site. AESOP's advisory board provides a national perspective and offers suggestions for addressing the critical issues related to access to science.

Hopefully, the network will allow us to gather experiences and data on successful classroom strategies. Teachers in the network who try the instructional units and record and share their experiences, provide valuable insight for the research component of the Project. Another objective of the Project is to determine what factors promote sustained implementation of innovation. In the past, research has shown that teachers have discontinued the use of new strategies for a variety of reasons, including a lack of appropriate inservice training. In AESOP, we are investigating factors leading to implementation of new strategies in teaching science to deaf students and the role the network plays in initiating and sustaining the use of these strategies over time.

To improve science instruction for deaf students--that is, to increase motivation to learn science, understanding of science principles, and access to the language of science--we are relying on the willingness of colleagues from different disciplines to collaborate and their willingness to reflect on why certain strategies are or are not effective. Our most recent experience with teachers in Rochester, Minnesota and Trenton, New Jersey shows us that not only are colleagues willing to cross discipline boundaries to create curriculum, they also find it stimulating and rewarding. Communication following the workshops indicates that when teachers take the time to reflect on their experience with new strategies, they have valuable insights for others. We expect that the growing AESOP network will be the right vehicle for exchanging these insights.

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