

# NTID RESEARCH BULLETIN

Department of Research · National Technical Institute for the Deaf · Rochester Institute of Technology

Vol.9 No.2/3 Spring 2004



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## **First Language Learning in a Sign Bilingual Program: An Australian Study**

By Greg Leigh and Trevor Johnston

### **Background**

Deaf children with a sign language as a first language (L1) have been reported as having an advantage in acquiring or mastering the majority community spoken language (effectively a second language—an L2) over deaf children who do not have a normal pattern of L1 acquisition in either a signed or a spoken language (Strong, 1988; Mayberry & Eichen, 1991). The advantage in the L2 of deaf children who have a signed language as an L1 is usually measured in the L2 as a written language, but it can also manifest itself in L2 oral skills. Bilingual educational programs for deaf children (hereafter “sign bilingual programs”) seek to exploit the L1 signing skills of deaf children in the learning of an L2, a majority community spoken language (primarily, but not exclusively, in its written form). In Australia, the L1 is Auslan (Australian Sign Language) and the L2 is English. In brief, sign bilingualism assumes that L1 competency in a natural sign language (NSL) will be positively associated with degree of proficiency in an L2 that is a majority community spoken language. To be able to claim that sign bilingualism is achieving these expected outcomes, evidence must be presented in at least two important areas. First, evidence needs to be provided that deaf children within a sign bilingual program actually have competence in the use of a natural sign language. In particular, this means showing that deaf children with hearing parents are learning an NSL effectively, and early—ostensibly, just as deaf children with

deaf parents do. Second, evidence needs to be provided that, as children progress through the grade levels, those with better skills in the L1 also prove to have better skills in the L2. We have been undertaking a long-term study to examine outcomes in an Australian sign bilingual program in order to seek such evidence on both fronts. This brief paper outlines the project and considers some data currently to hand on the first of these two issues.

### **The program**

The sign bilingual program that is being investigated includes a pre-school as well as a K-10 school-age program and caters for approximately 45 children across that age range. It has been operational for approximately ten years. At this stage, data is available for 36 children who have been enrolled in the program consistently over two of the years so far under examination. The study is intended to be longitudinal and more students and more data will become available in the time ahead.

### **Preconditions for success**

As part of the current study, we initially addressed the question of whether the program was able to fulfill the expectations of the sign bilingual philosophy. To this end, the first year of the study sought to examine a wide range of program characteristics including the following:

- Whether children were provided with adequate opportunity to develop their L1 skills prior to commencing school

*First Language Learning continued on page 3*

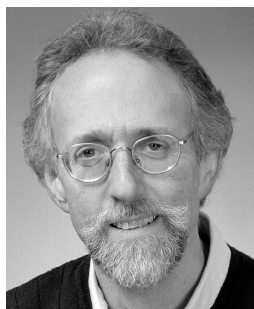
### **Notes of Note**

**Harry Lang** presented two keynote addresses at the end of February. His first talk, “Painting the Sky with Stars,” was presented at the conference Space Science: The Special Way, sponsored by the Virginia Space Grant Consortium (VSGC), a coalition of five Virginia colleges and universities, NASA, state educational agencies, Virginia’s Center for Innovative Technology, and other institutions representing diverse aerospace education and research.

On February 19 he presented “The Deaf Scholar’s World View: Continuity and Change” at the Second International Deaf Academics and Researchers Conference in Washington, DC.

The recently published *Handbook of Bilingualism*, edited by T. K. Bhatia and W. C. Ritchie (2004, Blackwell Publishing) includes a chapter by **Gerald P. Berent**, “Sign language-spoken language

*Notes of Note continued on page 3*



The two articles in this issue of the *Bulletin* represent two points on the education spectrum for deaf and hard-of-hearing students. One deals with early language learning at home and in the primary years at school, the other with language and literacy development at college. One challenges assumptions made regarding sign bilingual programs; the other challenges current approaches to second language skill development in career preparation programs. Though developmentally distant from each other, much research points to a relationship between the two; that is, success in school and career depend to a large extent on the timely acquisition of a first language.

The two authors in this issue represent distant points geographically as well. Dr. Greg Leigh is Assistant Chief Executive at the Royal Institute for Deaf and Blind Children (outside of Sydney, NSW, Australia), and Dr. Gerald Berent is a Professor in the Department of Research, NTID at RIT (outside of Rochester, NY, USA). That we were able to bring these scholars together in person and in print is due to the wisdom and generosity of the Royal Institute and NTID; the former provided a leave of absence to Dr. Leigh and the latter, continued funding for research and the Visiting Scholar Program.

We hope you find these reports informative and useful. The authors would be pleased to receive your reactions and comments. In addition, we would be pleased to receive your views and suggestions regarding research on deafness. We are actively seeking input on our research agenda, so now is the time to send us your ideas

about research that should be conducted. You may do this on line by visiting our website (go to <http://www.rit.edu/ntidresearch> and click on "Comments on NTID Research Agenda") or by contacting me through the *NTID Research Bulletin* address (below).

*John A. Albertini*

John Albertini  
Chair, Department of Research

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NTID RESEARCH BULLETIN

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John Albertini, Chair, Department of Research  
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*In addition to his appointments at the Royal Institute for Deaf and Blind Children and as Conjoint Associate Professor of Special Education at the University of Newcastle, Greg Leigh is a Fellow of the Australian College of Educators. The Royal Institute for Deaf and Blind Children is Australia's largest independent special education provider, offering a wide range of educational services to children who have significant hearing and/or vision loss, including children who have additional disabilities. In affiliation with the University of*

*Newcastle, the Institute administers Renwick College, a center for research and professional training in the education of children with impaired hearing or vision. Leigh's research interests include the examination of deaf children's classroom communication and literacy acquisition. He is currently engaged in an Australian Research Council funded project examining the use of closed and real-time captioning by deaf students. During Fall Quarter 2003, he was Visiting Scholar in the Department of Research at NTID.*

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### ***First Language Learning continued from page 1***

- Whether there was the provision of effective parent education in Auslan in the home or in specially provided classes and courses to ensure that parents are able to effectively support the development of Auslan at home
- Whether there were effective strategies for ensuring consistent interaction with native-like users of Auslan as a basis for early language acquisition
- Whether there were strategies in place for the teaching of both Auslan and English by competent users of both languages
- Whether there was adequate provision of teaching and curriculum resources in both languages, not just the L2

The results of this stage of the program have been reported elsewhere (see Johnston, Leigh, & Foreman, 2002). However, for the purposes of this brief overview, it is sufficient to note that we did not find a complete compliance with the ideal pre-conditions for a successful bilingual program. Briefly, the most problematic areas of program implementation included the effects of delayed enrollment in the program and the dearth of both second language pedagogy and physical resources in Auslan.

Following the initial evaluation stage and consultation, the school sought to address a number of issues to ensure that the overall educational program would actively address, and meet as closely as possible, all of the requirements for a genuine sign bilingual program. Recommendations were made for improvements in the program in

several areas. These included:

- Additional family support and parent education with a new parent curriculum for the teaching of Auslan prepared and implemented through a "Saturday School" model
- A new requirement for the certification of Auslan skills by teaching staff with additional intensive sign language training offered to all staff
- A project to develop additional classroom resources in Auslan. The first stage of this project has seen the translation of 40 children's stories into Auslan on video for use in classrooms and by parents at home
- The development of a beginner's CD-ROM interactive dictionary of Auslan (Johnston, et al., 2002) to help children and parents learn the basics of the language together at home

Against this background of implementation difficulties and subsequent program improvement initiatives, the study has sought to address the two research questions outlined above. The balance of this brief report addresses the first issue, that is, the extent to which children in the program are actually learning Auslan as a first or very early language. To investigate this issue, we have been able to successfully exploit the relationship between British Sign Language (BSL) and Auslan (see Johnston, 2002, McKee & Kennedy, 2000) to create a version of an existing test for BSL.

### ***The Pilot Auslan Receptive Skills Test (PARST)***

The Assessing British Sign Language: Receptive skills test (Herman, Holmes, & Woll, 1999) is the

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### **Notes of Note *continued from page 1***

bilingualism: Code mixing and mode mixing by ASL-English bilinguals." In this chapter, Berent explores bilingual behaviors that involve not only two languages but two modalities. He proposes that contact signing, simultaneous communication, and other ASL-English mixings are constrained by the same kinds of linguistic principles that constrain code mixing involving two spoken languages. The Handbook contains 31 chapters by experts in every area of the field of bilingualism.

**Sara Schley** has just been awarded a \$521,000 National Science Foundation CAREER award for a five-year project starting July 1, 2004. Sara's project, "Deaf children and young adults: Predicting school, college and labor success," is the first CAREER award ever received at NTID.

The Faculty Early Career Development (CAREER) Award is NSF's most prestigious award

### ***Notes of Note continued on page 4***

*Trevor Johnston edited the first comprehensive dictionary of Australian Sign Language (Auslan) which has now appeared in five editions (in both book and CD-ROM formats). He is currently coordinating several large research projects, including a study of "Sociolinguistic Variation in Auslan" and the recording and transcription of a digital "Auslan Archive" (an Endangered Languages Documentation Project funded by the Hans Rausing Fund, University of London).*

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### ***First Language Learning continued from page 3***

first standardized test of any signed language in the world that has been normed on a population and tested for reliability. The test measures comprehension skills in BSL, is suitable for use with children from 3 to 11 years of age and yields a standardized age-based score representing the child's level of BSL comprehension compared with the average score of age peers from the research sample. The instrument has the following target features: negation, size and shape specifiers, handling classifier signs, verb of motion classifier signs, number/distribution, and noun-verb distinctions. Given the close relationship between Auslan and BSL, we argued that a sign language proficiency test designed to be used with British children could be used for the testing of Auslan skills (see Johnston, in press). Further details of the design of the BSL receptive skills test, arguments for the legitimacy of its use with Auslan signers, and details of its adaptation into Auslan can be found in Johnston (in press).

For each of 40 test items, children are asked to select, by pointing, which illustration on each page best illustrates the signed Auslan message in a short video clip. The raw score is the number of correct answers out of a maximum of 40 and is converted to an age-based standardized scaled score using the conversion tables provided by Herman et al. (1999). For reasons explained by Johnston (in press), the mean for score for an Auslan native signer is taken to be 115. The standardized scaled score on the PARST is being used as the objective measurement of the children's competence in Auslan in the current study. One significant limitation of instrument

is that it is only deemed suitable, and normed, for children under the age of 12 years.

### **Are children learning Auslan as an L1?**

To the current point of the project, the PARST was administered to all children who were eligible to take the test on each of two occasions, with an average interval of 20 months. Notably, the test scores for all children with deaf sign language-using parents were within the normal or 'native-like' range. However, relatively few deaf children with hearing parents were 'native-like' in terms of their test scores. This confirms the validity of the assessment device but presents an obvious point of concern in regard to the low level of L1 acquisition of many children in the program.

Closer analysis of the results of the successive PARST assessments reveals an interesting pattern of language learning outcomes among the children in the program for whom L1 was not at age-appropriate levels. Specifically, it would appear that, for these children, Auslan development is significantly delayed but improves with time in the program. To investigate this issue, PARST scores were considered as a function of time spent in the program—the period of time elapsed from entry into the school (or pre-school) and the time of testing. A Pearson product-moment correlation coefficient was calculated for the scores on these two variables for 36 children in the program. This investigation revealed a strong significant relationship between the two variables ( $r = .455, p < .01$ ).

This finding suggests that there is a significant language (L1) acquisition benefit associated with length enrollment in the program. For the 22

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### **Notes of Note** *continued from page 3*

for new faculty who can integrate research into education, and who are most likely to become the academic leaders of the 21st century.

During the course of this grant project, Schley will focus on tracking deaf children's school, college and employment success longitudinally, and will apply profiles of success to both the college admission and career training process at NTID, RIT, and beyond.

Dr. Schley has also just been awarded tenure at NTID/RIT.

**Marc Marschark** has a new book: *Educating deaf students of all ages: From early intervention to life-long learning*. The book was published in March, in Chinese and English, by the Taiwan Association of the Deaf.

Marschark has just completed a seven-lecture tour in Australia, where he provided keynote addresses for three conferences, speaking about the challenges of mainstream education for deaf children and ethical issues in research and education pertaining to deaf children and adults.

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children who undertook testing on both occasions across the first two years of the project, there was an average increase of 13.7 points on the PARST (i.e., from 98.5 to 112.2,  $t = -4.364$ ,  $p < .01$ ). This indicates that, for children enrolling in the program, there is a clearly apparent process of development of skills in Auslan. However, these data also indicate that the children in the program cannot be described as a population of children that bring an intact L1 to the program—certainly not one that can be exploited immediately as a basis for learning a second language. Rather, the population under investigation is better described as a community of largely first language learners.

### Conclusions

To this point we have investigated several aspects of the implementation of the sign bilingual philosophy in a particular context and have demonstrated that, in this circumstance, there can be no valid assumption of firm L1 status on entry to, nor at any early stage of involvement in the program—at least not for children of hearing parents. It is likely that at least some of the delay in L1 acquisition is attributable to problems in program implementation—many of which are now being addressed. However, some issues, such as delayed program entry, delays or absence of parental language acquisition and usage, and lack of language resources in sign language are likely to be enduring and are therefore likely to account for continuing delays in L1 acquisition. Indeed, it is our observation that these are likely to be issues in other sign bilingual programs also. It appears that delayed L1 acquisition is likely to be a characteristic of children enrolled in all such programs.

Clearly, while there remains a delay in L1 acquisition, the theoretical benefits for L2 acquisition are unlikely to be fully realised. Early investigation of L2 acquisition and the hypothesized relationship between L1 and L2 learning in the current study reveals significant delays and differences between the children's L2 proficiency and age-level expectations. This issue remains under investigation as L1 outcomes continue to be monitored.

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Gerald P. Berent is a professor in the Department of Research at NTID.

## English Inspiring the Curriculum: A Comprehensive Model Combining English for Academic and Specific Purposes at NTID

by Gerald P. Berent

### Introduction

The English literacy challenge confronting NTID students is serious and persistent. The extent to which students are able to make appreciable gains in English skill development is an important determinant of their educational and career success. In response to the English challenge, NTID for many years has called for the infusion of English teaching principles across the curriculum. The former Technical and Integrative Communication Studies Department, the NTID English Department, the English Outcomes/English Literacy Committee, other committees, a professional development series, and individual faculty members have made progress toward establishing English-across-the-curriculum (EAC) at NTID. In addition, the “Supporting English Acquisition” website ([www.rit.edu/~searwww](http://www.rit.edu/~searwww)) was developed as an on-line faculty resource offering suggestions for EAC course activities.

Building on these cumulative efforts, NTID has recently proposed a comprehensive plan for infusing *communication* knowledge and practice across the curriculum. NTID’s “Educational Model for Communication for NTID Students” calls for a college-wide effort to support students’ communication skill development in the broadest sense, including English, American Sign Language, communication in the signed, spoken, and written modalities (as appropriate), and knowledge of telecommunication technologies.

In this article I propose a comprehensive EAC model that is informed by NTID’s progress toward EAC implementation, by research on deaf students’ English language development, and by the field of teaching English as a second language (TESL). This proposed EAC model fits well within NTID’s proposed broader model for supporting “communication across the curriculum.”

### Development of the Model

At NTID, students are generally taught English for Academic Purposes (EAP), a domain of TESL. EAP

focuses on English language skills that are necessary for success in an academic environment, including academic discourse, reading, writing, grammar, and study skills. Given the technological orientation of most NTID programs, another relevant TESL domain, English for Specific Purposes (ESP), is appropriate to the educational and career needs of NTID students (Meath-Lang & Albertini, 1983). ESP instruction is designed to meet the English language needs of students in specific disciplines. For example, ESP instruction for students majoring in digital imaging and publishing technology would focus on the particular English discourse, style, structure, and vocabulary used in that field. (For detailed information on EAP and ESP, see Jordon, 1997.)

At NTID there has been some progress toward ESP. For example, a multidisciplinary team worked five years to identify the causes of students’ problems with technical report writing and to develop strategies to help students produce editable writing (Shannon, Senior, & Keiffer, 1994). Nevertheless, ESP is surprisingly absent from the formal NTID curriculum.

Given the logical need for both EAP and ESP instruction in a technological postsecondary environment such as NTID’s, the goal of my proposed model (see the figure on p.8) is to *inspire* the NTID curriculum through the incorporation of ESP instruction. The figure shows that EAP would continue to be taught in NTID’s formal English programs and that supplementary ESP would be incorporated into NTID technical programs. The higher diagonal arrow indicates that NTID technical programs would also complement the EAP instruction provided in English programs. Despite some differences in focus and methods, EAP and ESP are not mutually exclusive.

The success of the “English Inspiring the Curriculum” (EIC) model depends crucially on professional development and support. Faculty will take short courses and workshops to gain familiarity with ESP principles, methods, materials, and activities. A website devoted to ESP activities for each NTID technical program will be developed as a faculty resource. Most importantly, teams of English instructors, curriculum developers, and technical faculty will collaborate to incorporate ESP activities in a manner that does not compromise

*Jerry Berent's research focuses on deaf students' acquisition and use of English, comparisons between deaf and hearing learners of English, teaching methods and materials, and the identification of secondary disabilities in deaf students. For more information, he can be reached at GPBNCI@RIT.EDU.*

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existing course goals. ESP will not be an *addition* to the technical syllabus; it will be *interwoven* into existing course content. Collaborative research will provide the relevant assessments to measure the needs, progress, and efficacy of the EIC model.

As his own contribution to EIC, John Cox, chairperson of the NTID Art and Computer Design Department, developed the following written assignment (slightly abbreviated here) that he uses in his Perspective Drawing course:

**OBJECTIVES**—When you complete this project, you will be able to:

1. Identify and describe strengths and weaknesses in perspective drawings completed by other people.
2. Write comments and recommendations, using correct English sentence structure.
3. Correctly use vocabulary related to perspective drawing.

**DO THIS:**

1. Participate in critique during class.
2. Select ONE drawing done by another student. Use your "Perspective Drawing Critique" sheet to review the drawing and identify three or four strengths and weaknesses of the drawing...
3. Write a brief message to give this other student some advice about the drawing... Your message should be clear, using correct English with good grammar and spelling. Remember that your goal is to make your recommendations clear to this person.
4. After your instructor has checked your rough draft, make all your corrections; then send your message...to the other student... Also, hand in your completed "Perspective Drawing Critique" sheet to your instructor.

Without formal knowledge of ESP principles, Cox has produced an assignment that reflects sound ESP methodology. The assignment is naturalistic and communicative, is based on class discussion of the technical subject matter, elicits the functional English forms used for comparing, critiquing, summarizing, and recommending, and emphasizes that *clarity* is the primary communicative goal. The assignment relates directly to the development of vocabulary specific to perspective drawing and the use of that vocabulary in written discourse exhibiting

correct grammatical structure and spelling.

Cox (personal communication) noted that he would like to provide each student with more detailed feedback than is possible given the technical goals of the course. He also expressed the concern that he is not a trained English teacher. To these concerns I would respond that the professional development, collaborative teams, and other resources of the EIC model will provide the guidance to develop short, simple ESP assignments, to interweave them naturally within the technical curriculum, and to develop guidelines for appropriate feedback from non-English-teaching faculty.

### **Conclusion**

A comprehensive model such as EIC holds great promise for helping NTID students to attain the markedly higher levels of English literacy necessary for greater educational and career success. The model increases the quantity and quality of English instruction through the appropriate inclusion of both EAP and ESP and provides the training and support required for sustaining this kind of collaborative, college-wide effort.

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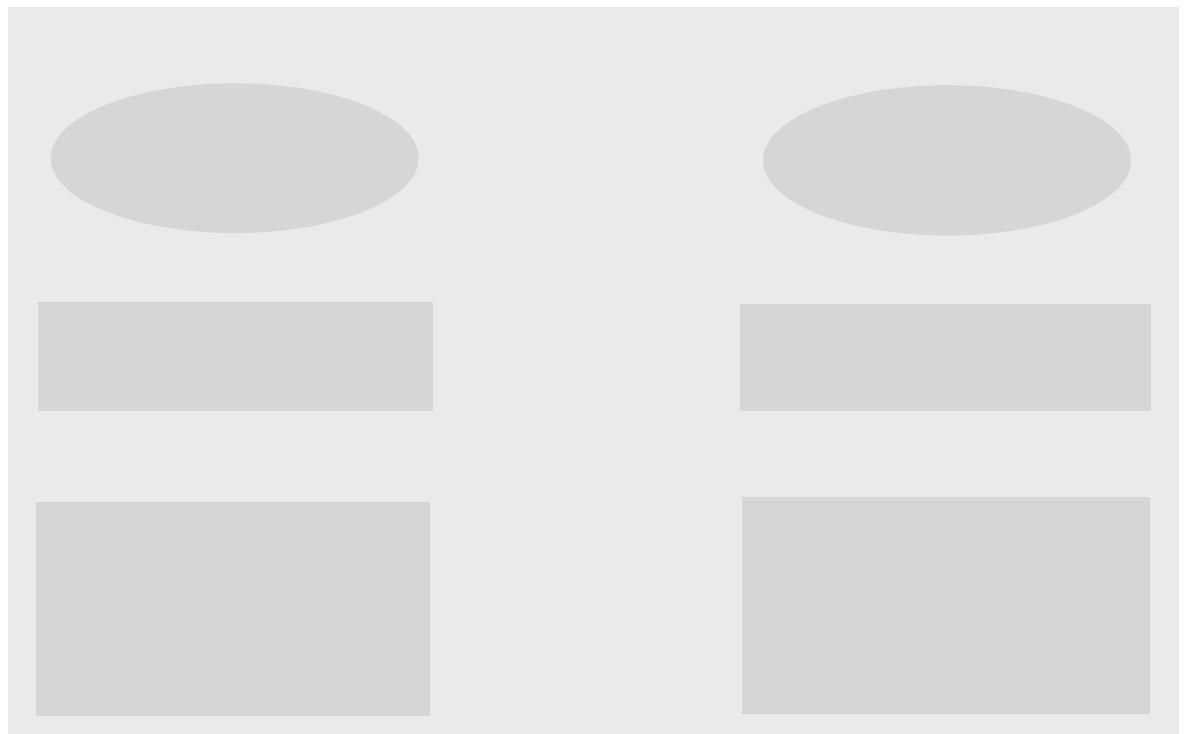
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# IMPLICATIONS OF NTID RESEARCH

FOR DEAF AND HARD-OF-HEARING PEOPLE • NTID RESEARCH BULLETIN

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*A primary mission of the Department of Research is to "foster advances in teaching and learning that enhance the academic, professional, social and personal lives of people who are deaf or hard of hearing." Among its other functions, the Department of Research conducts research relevant to that goal and supports research conducted by colleagues from across NTID.*

*As part of its collaborative efforts, the Department of Research regularly undertakes the collection and dissemination of relevant research findings from across NTID. NTID Papers and Publications is published every two years. Implications of NTID Research, published in alternate years, includes the implications of the research findings for each publication that the author thinks will be most relevant for NTID's audiences.*

**Foster, S.B., Long, G.L., & Saur, R.E. (2004). Class Act: Promoting access for deaf and hard-of-hearing students.**  
[www.rit.edu/classact](http://www.rit.edu/classact).

The Class Act website is funded through grants from two Department of Education (USDE) programs: the Fund for the Improvement of Postsecondary Education, and Demonstration Projects to Ensure Students with Disabilities Access to a Quality Higher Education. Collaboration between NTID and the College of Science at RIT led to Project Access (the "umbrella" project), funded by RIT Provost's Learning Innovations "Proof of Concept" and "Adaptation and Implementation" grants.

Project Access seeks to improve existing teaching practice and access for deaf and hard-of-hearing (D/HH) students in mainstream postsecondary classrooms. It includes customized interactive workshops, classroom observations and feedback, student-run activities, research on inclusion, the Class Act website, and other products and activities of the USDE grants.

## Implications

This website ([www.rit.edu/classact](http://www.rit.edu/classact)) will increase faculty awareness of how their behaviors facilitate or hinder access.

Additional features include:

- Challenges faced by faculty members
- Specific strategies for modifying teaching styles to promote inclusion
- On-line videotapes of D/HH students describing challenges they face in college settings
- Handouts, such as "Communication Guidelines for Deaf, Hard-of-Hearing and Hearing Students Working in Groups"

Feedback on the website is enthusiastically sought, and suggestions for materials, challenges, or strategies that can be added are most welcome. The project team continues to develop additional products and tools for mainstream postsecondary instructors and D/HH students who attend mainstream programs. If you would like more information or have ideas to share, please contact Foster, Long, or Saur at [SBFNIS@RIT.EDU](mailto:SBFNIS@RIT.EDU) (Foster), [GLLERD@RIT.EDU](mailto:GLLERD@RIT.EDU) (Long) or [RESNSC@RIT.EDU](mailto:RESNSC@RIT.EDU) (Saur).

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Opinions expressed in the *NTID Research Bulletin* do not reflect those of NTID or RIT. Your comments, questions, and requests for information are welcome.

We encourage you to reproduce articles from

**Kelly, R. R. (2003). Using technology to meet the developmental needs of deaf students to improve their mathematical word problem solving skills. *Mathematics and Computer Education*, 37(1), 8-15.**

PROJECT SOLVE (<http://problemsolve.rit.edu>) is a web-based mathematics problem-solving project for deaf students supported by a grant from FIPSE. The site provides web-based problem-solving instruction and guided practice for mathematical word problems, offering college and high school teachers a platform to provide deaf students independent assignments for practicing and improving their analytical thinking and problem solving skills without having to restructure their courses. The website provides a range and variety of word problems presented in language typically found in high school and college mathematics courses. An optional help menu provides clear concise written and graphic information to guide students with a range of reading abilities (8th-12th grade) through each mathematics word problem. After students finish solving a

problem and submit their answer, they can access a “show me how” button that provides step-by-step procedures for solving that problem.

Another innovative feature is that PROJECT SOLVE captures the students’ sequential access to the guidance help and their answer, saving all this information to a database for subsequent use by teachers and researchers.

**Implications**

PROJECT SOLVE addresses, in an innovative and practical way, a critical problem facing most deaf college students and other learners with special needs—inadequate preparation and practice in problem solving and analytical thinking. While deaf college students are the primary audience, this project has clear implications for other students for whom reading and mathematical word problem solving is difficult, especially Learning Disabled (LD) students. It also has instructional implications for high school students who are college bound, and who face similar difficulties with reading comprehension, problem-solving logic, and organization.

*If you would like to obtain information in an area beyond what you see listed, you can write to the first author of closely related papers, c/o NTID. If you are unable to obtain one of the publications on this sheet from your local library, you may send this form to: Educational Technology Resource Room, National Technical Institute for the Deaf, 52 Lomb Memorial Drive, Rochester, NY 14623-5604.*

\_\_\_\_\_*Kelly, R.R. (2003). Using technology to meet the developmental needs of deaf students to improve their mathematical word problem solving skills.*

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