Project Title: Exploiting Crossword Puzzles in the Teaching of American Sign Language

Applicant:

<table>
<thead>
<tr>
<th>Name</th>
<th>Jack Burston</th>
<th>Telephone</th>
<th>5-3156</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dept.</td>
<td>Language &amp; Literature</td>
<td>College</td>
<td>Liberal Arts</td>
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Title
Exploiting Crossword Puzzles in the Teaching of American Sign Language

Summary of proposed project
Crossword puzzles have long been used as an effective and motivating pedagogical tool in foreign language instruction, most particularly for vocabulary acquisition. However, in traditional paper and pencil format, they have for obvious reasons not been usable with ASL. With the advent of video-based ASL dictionaries, however, the possibility now exists to create computer-based crossword puzzles adapted for use with ASL. More specifically, ASL signs can be incorporated into a crossword structure by using them as visual clues for the vocabulary items that constitute the puzzle grid. The purpose of the proposed project is to develop a crossword puzzle generating system that allows instructors to create online materials to help students, working on their own, improve their sign recognition skills. The project is particularly efficient in that it seeks to achieve this objective by exploiting readily available technological resources.

The construction of an online ASL crossword puzzle poses two major challenges. Firstly, the creation of the interactive crossword puzzle grid and, secondly, the association of ASL video clips with the grid entries. The proposed project meets the first of these challenges by using an off-the-shelf, inexpensive, and easy-to-use crossword puzzle generator, Crossword Compiler. Crossword puzzle grids created with this software can be automatically saved in an interactive web-based format. ASL visual clues for the grid are provided through an existing NTID video library. The second challenge, that of linking the video clip inventory to the puzzle grid, requires the programming of a user interface, for which funding is being sought.

A prototype proof of concept (which runs in Windows using Java, HTML, and Internet Explorer/ Netscape) may be seen at the following URL:
http://fltc.rit.edu/CrosswordHTMLFiles/0503-400/asldemo.html

Though operational, the present interface used to create the prototype is piecemeal, limited in functionality, requires considerable instructor intervention, has no error checking, and is hardwired to a specific lexical inventory and ASL video clip library. The new interface, to be programmed in Visual Basic, could be used with any vocabulary list/ ASL video library. It would allow all operations to be handled from within a single window (see attachment) through simple file browsing and selection. Specifically, the crossword puzzle grid entries, scrollable word list and video clip inventory, and media player for the display of the video clips would all be readily accessible from one location. An ASL Crossword Puzzle CD-ROM would be created for distribution to instructors. It would contain a basic demo version of Crossword Compiler, the NTID video clip library, and the ASL user interface. Initially, a 10-copy site license would be acquired to unlock the demo version of Crossword Compiler for those instructors wanting to make regular use of the system. Should more licenses be required, these would be purchased with funding from the COLA and NTID.
1. **Targeted learners or population** (include cluster, departments, year level, number of learners impacted).
   ASL students within the COLA: Beginner’s level, 200 annual enrollments
   ASL students within the NTID: Beginner’s/Intermediate level, 350 annual enrollments

2. **Anticipated impact on teaching and/or learning.**
   The immediate impact of the proposed project on the teaching of ASL is that it would allow instructors to easily and quickly create a type of tutorial exercise for the practice of sign recognition that has not previously been possible. By creating their own materials, instructors could attune exercises to the specific vocabulary of their courses. This could either be done as a form of review of taught signs or as an opportunity to learn new signs by incorporating into the crosswords a proportion of vocabulary that has yet to be encountered in the classroom. As in all crossword puzzle activities, students would thus use what they know to discover what they need to learn. Moreover, because the new ASL crossword puzzle interface would allow instructors to associate one word with multiple visual clues as well as link multiple words to the same video clip, they would be able to use the crossword puzzles to target the teaching of homonyms and synonyms. The resulting ASL crossword puzzles could be distributed either via the WWW or CD-ROM, the latter having the advantage of avoiding bandwidth restrictions that can adversely affect the playing of video files over slow modem connections.

   The main benefit of the proposed project to students comes from the flexible access it gives them to practice sign recognition on their own. If instructors so desire, the interactive crossword puzzles generated by the system can provide feedback in the form of hints and incremental (word by word) answer checking. A further benefit is the positive motivational effect that puzzle solving has on learning. Anything that increases student exposure and attention to signing is bound to improve recognition and retention, all the more so when it is a challenging and enjoyable activity.

3. **How will your project impact student success (i.e., retention)?**
   In ASL, as in all language learning, vocabulary acquisition is the single most important constituent of comprehension. Vocabulary size likewise correlates very highly with overall linguistic competence. The proposed project is expected to foster more successful language learning by giving students an independent means to reinforce vocabulary studied in class, as well as to use familiar words to learn new signs on their own. As in any subject, the more successful learners are, the more likely they are to continue their studies.

4. **How will you measure the impact, how you will report your findings, and what you will share about your project in a faculty forum?**
   Once the new interface is created, workshops would be organized to teach ASL instructors from the COLA and NTID how to use the system. While many instructors may choose to use the system on an occasional basis, it is expected that some will want to more systematically integrate the use of crossword puzzles into the curriculum. Working in collaboration with this cohort, the impact of the proposed project upon the teaching and learning of ASL would be measured both qualitatively and quantitatively. Towards the end of the first quarter of usage, a short questionnaire would be prepared to assess the views of teachers as well as students regarding the perceived usefulness of ASL crosswords. It is also proposed to evaluate the effectiveness of crossword puzzle usage by conducting a study of the results obtained with core vocabulary in classes that regularly use the system.
compared to those which do not. Findings would be reported locally via a faculty forum and more broadly through a formal study which would be submitted for publication in the journal of the Computer Assisted Language Instruction Consortium (CALICO).

5. Present a rationale for your project, as it ties to the intent of the grant, including:
   a. Why it is not part of regular college business
      The pedagogical use of crossword puzzles is not a regular part of ASL instruction for the simple reason that until very recently the technological means (i.e. online crossword compiler and video-based ASL lexicon) needed to create them has not existed.
   b. Its relevance to required cluster, college, and/ or department competencies
      Sign recognition is essential to acquiring competence in ASL. Aside from being the first stage of the overt learning of signs, comprehension skills are arguably the most critical to language acquisition and motivation to continue study.
   c. Describe how your project is relevant to other faculty and what you think it would take to transfer your success to other faculty
      The proposed project is directly relevant to faculty in the COLA as well as the NTID. ASL instructors who have seen the prototype have expressed an interest in learning how to create their own materials. Transfer would take place through NTID supported workshops, the first of which is scheduled for April 2, 2004. The latter will be jointly conducted with an “early adopter” ASL instructor who will demonstrate how the present system works. The key to success in engaging ASL instructors is the creation of the proposed interface to allow materials to be more easily prepared with minimal time and effort.
   d. Relevant credentials, experience of involved faculty/ staff
      The project applicant is Director of the Foreign Language Technology Center, with a Ph.D. in Linguistics and over 30 years practical foreign language teaching experience. He likewise has nearly 20 years experience in the design of Computer-Assisted Language Learning software. He is also the CALICO Software Review Editor and is presently overseeing the evaluation of three sign language programs. The creator of the prototype ASL crossword compiler interface, who would also be responsible for programming its proposed replacement, is a final year RIT student in Information Technology.
   e. In what respect does the project demonstrate innovation in your discipline or program?
      Technologically, the project makes innovative use of easily accessible existing software to extend its application to the teaching of ASL. Pedagogically, the resulting ASL interface will allow instructors to produce sign recognition exercises of a type not possible before. It will also engage them, many for the first time, in instructional technology.

7. Provide a timetable of the development of the project.
The programming of the new crossword compiler interface is expected to take four weeks to complete, as follows:
   Week 1: Design graphical user interface
   Week 2: Create algorithms to extract and organize vocabulary/ video clip listings and crossword grid solutions.
   Week 3: Create database structure for storage and retrieval ASL video library data links and crossword grid solutions.
   Week 4: Incorporate ASL video clips into the online crossword puzzles generated by
Crossword Compiler; beta test, debug, fine tune user interface
Exploiting Crossword Puzzles – Jack Burston

Using attached form, complete a detailed budget for the project. Signatures of appropriate budget officers need to be included. Department Head signature is required for single department projects. College Dean signature is REQUIRED for interdepartmental (Adaptation and Implementation Program) projects.

PROPOSED BUDGET - PROOF OF CONCEPT PROGRAM (Track 1)

Funds can be used to cover release time, pay student workers, and/or purchase supplies and services (such as CD pressing, video production, digitizing, photography). Funds will generally not be available for activities consistent with normal college business, overload pay, scholarly research, capital equipment purchase or travel - though the latter will be considered if a clear connection to the project can be demonstrated.

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<td>Other Compensation - Professional services</td>
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<td>Computer programming @$12.50/hr x 35 hrs x 4 weeks</td>
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DEPARTMENTAL/ COLLEGE SUPPORT
The COLA and NTID will provide funding as required for additional copies of Crossword Compiler.