3.CAST

Essential to our project is an iterative process of deployment, formative evaluation, revision and re-deployment.   To accomplish that research cycle efficiently, we will engage two organizations whose primary purposes are educational research and development with individuals who have disabilities. Both CAST and Do-It have ongoing research projects which are intimately related to this project and which will allow us to leverage their methodological expertise and their research sites.

CAST, for example, has recently completed two SBIR Phase 1 projects (Phase II submitted and under review) which have investigated accessibility of a commercially available web-based course delivery system. Conducted at several colleges and universities in New England (University of Southern Maine, University of Southern Connecticut, and Northeastern University), that research involved essentially identical subjects and methodologies as will be involved in this research. Having developed good research relationships with those institutions and with individuals who have disabilities within them (as well as their disability offices) CAST will repeat the process for this research. CAST also has two Department of Education research grants which are investigating access issues to web-based learning environments for students at the high school level who have various high-incidence learning disabilities (e.g. dyslexia, attention deficit disorder). Another related grant from NSF is investigating desktop captioning in science classes for students who are deaf.

Sample: For this research we will focus on students in college or university settings who have relatively low incidence and high need disabilities such as blind/low vision, deaf/hearing impaired, orthopedically/motorically impaired. We have found that it is difficult to obtain an adequately diverse sample of such students in a single institution and are likely to fill out the sample across several institutions as we have done successfully in the past. In previous research we have found that close observation and follow-up with a small number of students is more informative than cursory or summative evaluation with a larger number. Therefore, through our contacts at offices of academic support for students with disabilities, we will identify a minimum of 6-10 students who span all three categories of disability identified above. We will specifically solicit students whose disability has thus far required assistive technology devices and/or adaptive software (e.g. screen readers, single-switch access devices, etc.), and for whom these adaptations have been an essential component of their academic life. Where possible, students will be found who are engaged in the same courses as the testbed content is designed for.

supported, and private. A researcher from CAST will introduce the system, train the student in its use, and conduct the on-site evaluation through structured observation of the example lessons, survey questionnaires, and extended interviews (see below). Each evaluation may consist of multiple sessions so as to obtain optimal results.

Data Collection

Because the individuals in this sample will be diverse and may require intensive support, our data collection for this analysis is necessarily qualitative and formative. The data collection methods and materials will be developed as a part of this project but will include the following;

Research Goal	Specific information sought	Instrument	Sample Size
General sample characteristics and preferred adaptive device information.	Demographics of the sample; particular assistive technologies utilized	<u>Survey questionnaire and checklist</u> developed for this project from previous CAST work.	6-10 individuals.
Qualitative measure: customary use of adaptive technologies and learning supports.	Information about students' customary use of assistive technologies and software in study settings.	<u>Structured observations</u> of student work (nature of assignments, tools and system supports used, difficulties, advantages, comments).	10-20 observation, 1-2 of each individual student in the investigation.
Qualitative measure: enhanced use of experimental CDAKN system	Information about students' capacity to learn and use the system under design and to learn from it.	<u>Structured observations</u> of student work while using the system (including compatibility estimates with existing technologies, usage of specific features, difficulties, advantages, etc.	10-20 observation, 1-2 of each individual student in the investigation

The methods of data collection cited above will be repeated each year, with new students as needed. In the final year, collection will be embedded within actual course trials rather than in isolation.

Analysis

The qualitative data will be analyzed to identify system compatibility with conventional assistive technologies, to evaluate within-system features and functions, and to ascertain user satisfaction with individual components and with the aggregate system. This information will be used to provide a report for modifications in development and for evaluation of the overall system in realistic settings.