COMPASS: SOFTWARE FOR COMPUTER SKILLS ASSESSMENT

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ABSTRACT

A thorough assessment of client abilities is a key factor in a successful computer access intervention. Software is being developed to present consistent computer access tasks, record client data, and assist in data analysis. Prototype software was evaluated in usability trials by eight rehabilitation professionals with experience in computer access evaluations and interventions.

INTRODUCTION

A thorough, accurate, and efficient assessment of client abilities is a prerequisite for a successful computer access intervention. Quantifiable measures of a person's skills can assist a rehabilitation professional when comparing devices in order to select appropriate interventions. These measures can also assist in justifying interventions and tracking the outcome of an intervention over time.

A number of assessment tools, such as Matching Person and Technology and the Lifespace Access Profile, provide useful assistance to rehabilitation professionals in determining clients' assistive technology goals and needs [2]. However, these tools provide limited support for specifically measuring a person's functional abilities related to computer access. Some tools do focus on specific computer skills, and even define standard computer exercises [3,4,6]. Most existing tools rely on the rehabilitation professional to perform the tests using standard computer software (such as word processors or icons on the desktop of a standard graphical user interface). The results of the tests will depend somewhat on a person's software. They also require the clinician to manually measure quantitative performance (e.g. using a stopwatch to measure time to complete a task) and make judgments about performance based on a Likert-type scale. Computers could aid in data collection and interpretation of results [7]. A computer could automatically record measures such as speed and accuracy, leaving the clinician free to observe more subjective aspects of client needs and preferences. The data would then be saved on the computer for future analysis, and for inclusion in future reports and letters of justification.

Some software has been developed which automatically presents consistent tasks and records results [1]. These programs tend to focus on one specific computer access skill (e.g., use of a pointing device, typing, or scanning) and have largely been used in research settings. One software package is currently available which presents evaluation exercises for a range of computer access skills (EvaluWare, Assistive Technology Inc). However, EvaluWare does not automatically record performance data.

Prototype assessment software (Compass) has been developed to capitalize on the advantages of computer-supported assessment [5]. Compass is being further developed to provide additional assessment tests, more functions, and support on multiple platforms.

DESIGN

Compass consists of four components. The *client interface* presents tests which evaluate skills related to keyboard use, pointing device use, text entry, and use of switches for scanning and other alternative input methods. Skill tests will address both low-level skills, such as the ability to press and hold a switch, and higher-level skills, such as editing a sentence.

The *clinician interface* is used by the rehabilitation professional to select skill tests, customize the tests for individual clients, and enter client information.

The *data visualization interface* allows clinicians, clients, family members and case workers to examine data collected during skill tests. Compass will support summaries of client skills and comparisons of performance between user interface methods or across time.

The *telerehabilitation interface* supports remote assessments by allowing any of the skill tests in the client interface to be presented over the World Wide Web. Clinicians will be able to guide clients through exercises using a speakerphone or videophone, or prepare a series of exercises which the client can perform independently. In either case, client performance measures will be stored and transmitted to the clinician for later analysis.

DEVELOPMENT

Compass is being developed in the Java programming language (Sun Microsystems, Palo Alto, CA) to provide support across operating systems and facilitate offering Compass as either a local or web-based application.

USABILITY TESTING

The overall design of Compass was informed by surveys and interviews with rehabilitation professionals. A preliminary Compass prototype was developed using Visual Basic (Microsoft Corporation, Redmond, WA) in order to evaluate the proposed screen layouts. Usability testing was performed in which eight rehabilitation professionals performed seven assessment tasks. All subjects were able to successfully complete all seven tasks, with no orientation or prior instruction on using the system. Overall, the 7 tasks required an average of 16 minutes to complete, significantly lower than the target time of 37.5 minutes derived from clinician surveys. Clinicians gave the software an average rating of 4.3 out of a possible 5, on 10 survey items related to the software's ease of use, learnability, and usefulness.

DISCUSSION

Software is being developed to provide consistent testing and quantitative analysis of a person's functional computer access skills. Usability testing and surveys of rehabilitation professionals indicates that this software can be a useful and efficient component of computer access evaluations. A revised prototype incorporating the results of usability trials will be completed in January 2003 and further usability testing will be performed. In this second round of usability trials, eight clinicians will use Compass to perform

simulated assessments, and eight clinicians will perform assessments with actual clients. Both clinicians and clients will evaluate software usability.

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