Assistive Technology for Adults with Reading Challenges: The Quicktionary Reading Pen Option

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Abstract:

Assistive technology has provided tools for adults with learning difficulties to improve their quality of life, especially in the areas of reading, mathematics and writing. The Quicktionary Reading Pen was used by a group of adult students and their tutors to discover its utility in increasing reading decoding and comprehension. Subjects who participated in the study were all enrolled in a metropolitan adult literacy program. Results were mixed. The Quicktionary Reading Pen was found to be very useful for some adult students while others did not find it to be helpful at all. These results were also corroborated by tutors.

Introduction

Adults with literacy problems have posed challenges to communities throughout the United States for many years. The challenges were highlighted by the National Adult Literacy Survey (NALS) and the passage of the National Literacy Act of 1991 (PL 102-73). The Literacy Act captured the full scope of the literacy problem nationally and sought to address the needs of a multiplicity of populations who depend on the good work of literacy providers, those persons who are poor readers, learning disabled, school dropouts, economically disadvantaged, and speak English as a second language. Literacy centers are in the cross hairs of the challenge. Despite their best efforts many of the students who participate in literacy programs only make modest gains (Reder, 1995). Moreover, it is well known that literacy efforts are concentrated in some areas or communities while other communities are under –resourced compared to the magnitude of the problem (Reder, 1995).

Individuals who attend literacy centers are typically those who have not learned to read with requisite proficiency during their school-age years. Several factors complicate the effort to teach them: the infrequency of direct instruction, diversity of learning styles, lack of support while working on "homework", variability of teacher expertise, as well as the complex demands of adult life. Thus it is not uncommon for progress in learning to read to be slow, arduous, and very time consuming.

A viable question that has emerged from the literacy providers with influence from the learning disabilities community is the role of assistive technology to aid instruction and to provide important accommodations to by-pass learning deficiencies. Assistive technology has been shown to be very helpful in school and post secondary

settings, in the workplace and in meeting the demands of everyday life (Magrum & Strichart, 1988; Raskind, 1993; Raskind, 1994; Raskind, Higgins & Herman, 1997). For individuals with learning disabilities, for example, assistive technology is found via computer applications (i.e. spell-check, proof-reading programs, voice recognition, and optical character recognition systems). Portable devices such as hand calculators (talking feature optional), audiotape recorders Franklin spellers, and personal data managers (e.g. Palm Pilots), to name some, are also useful and readily available.

Portability is an important feature so individuals can use a device on demand in a variety of settings during any given day. Yet in the area of reading all of the assistive technology has been available only in bulky, work station configurations. One piece of assistive technology, the Quicktionary Reading Pen (QRP), however, allows for an individual with reading problems to use it any time, any place. In essence, wherever the need arises for decoding or comprehending the written word, the QRP can be available.

Although the QRP has been used for a number of years in a variety of adult populations there has not been an investigation exploring its utility. The purpose of this paper is to convey the results of a study done at a metropolitan literacy center to gauge the usefulness of the QRP from the perspectives of adult learners with reading challenges and their tutors.

Method

Subjects

The participants were adults with reading disabilities (some students with suspected learning disabilities) from the READ Center in Richmond, Virginia. The READ Center is a large metropolitan center for adults who have a variety of literacy challenges. It has been in existence for more than a decade and is supported through funds from the United Way and other private and public benefactors. It is staffed by paid professionals and community volunteers. All tutors are volunteers who are trained before they are matched with literacy students.

Six pairs of tutors and students were selected for the study. One student who participated in the study declined to be interviewed. The tutors were five females and one male. All of the students were male and ranged in age from 23 to 67 years old. Each pair typically met once per week at the READ Center for their tutoring session. All students were reading below the second grade level.

The Quicktionary Reading Pen

The Quicktionary Reading Pen (QRP) is a portable (battery-powered) handheld tool about the size of a man's electric razor (five inches and three ounces). It is able to scan a printed word (6-22 point font), and then say the word via a computer-synthesized human-like voice through a built-in speaker or earphone. Simultaneously, the scanned word is displayed in large characters on a small LCD window. There are additional features in the QRP that aid the reader. They include: displays syllables, spells words out loud, keeps a history of scanned words, contains over 200,000 definitions found in the

American Heritage College Dictionary, defines words with definition (cross reference), scans inverted hyphenated text, and scans left or right depending on the comfort of the user.

Features are accessed through a small keypad on the QRP. Each QRP comes with both an audio taped manual and videotaped tutorial. The QRP has been in existence for eight years and a new model was introduced January, 2001. That model is beginning to make its way into the market place.

Procedures

Initial training to use the QRP was done in the READ Center for the participants of the study. The trainer was provided by WIZCOM Technologies Inc., the developer of the QRP. Each student and his tutor received one QRP and worked together in the initial training. The training, which lasted for one and a half hours, consisted of demonstration, viewing the QRP tutorial videotape, and individual technical assistance. When the training was complete each pair had a working knowledge of how to use the QRP. Participants in the study were informed that they would be interviewed by phone after they had used the QRP for about six or seven weeks. All participants were interviewed individually by the same research assistant. In addition, at the initial QRP training students and tutors were informed of their rights as study participants and signed forms consistent with the policies of the Institutional (Research) Review Board of Virginia Commonwealth University.

Instrumentation

Questionnaires were developed for tutors and students. The tutor questionnaires had 12 questions, and the student questionnaires contained 10 items. Appendix 1 shows both questionnaires. All questions were open-ended and completion of the questions took approximately fifteen minutes for students and twenty minutes for tutors.

Data Analysis

Data were analyzed in the two respective groups and then combined to highlight similarities and dissimilarities. All procedures were done following the qualitative methods set out by Miles and Huberman (1994). In phase one data were reduced into low inference categories. In addition, quotes were gathered to embellish the reporting of the results. In phase two interview protocols were searched for patterns and themes across the two groups. Data categories were collapsed into higher order themes separately and then combined to synthesize commonalities of perspectives. Phase three led to drawing conclusions through the emergence of patterns and verifying those conclusions.

Results

Students

The students mainly used the QRP for spelling and finding definitions of words they did not know. Some students mentioned that it prevented frustration when reading, especially the words they did not know. Those who used the QRP at home (independently) used it to read short stories, books and newspapers. One student used it

to read his bills and his mail. Another used it to read a simplified book on the writings of Socrates and Plato.

Limitations were noted by the students, however. Those noted were: not picking up smaller fonts, requiring multiple tries to scan the word before it appeared on the QRP screen, problems deciphering handwritten words, trouble understanding some of the definitions it generated, and difficulty in understanding the computer generated voice of the QRP.

Despite the criticisms it seems the QRP can make students better readers. One student remarked, “When I am alone I can read more, and I don’t need some one else to read with me.” Another student mentioned that he is helped in the area of spelling. Yet there was still general frustration using the QRP. In one case there was an equivocal response, “It helps me read the words but not necessarily understand the meanings of the words I don’t know.”

When queried on the effects of the QRP on comprehension students responded favorably. One student said it helped his comprehension if he was able to understand the computer generated QRP voice. Other students applauded the QRP dictionary. The definitions were “right there” said one and another commented that it was helpful that the definition was read out loud.

The QRP was reported to be used at home by some, but not all, of the students. For those who did use the QRP it was used a minimum of two times a week mostly in reading books, while others used it also to read bills, letters and mail.

When asked about difficulties using the QRP, the students responded favorably in general. There were responses such as “once I got used to it all was fine”, and “at first it

was difficult but my wife helped me and it works well". Another student remarked that the initial training to use the QRP was helpful. But yet another student expressed frustration saying, "It is very awkward to hold and doesn't read the words. Sometimes the QRP says unavailable when I have scanned a word".

There were mostly positive statements when asked how long it took to feel comfortable with the QRP. A few students responded "right away". Another said he felt comfortable after using it a couple of times, while still another student was able to use the QRP after practicing the left to right scanning motion needed for the QRP to "read" the word. One student remarked he uses it but still has not reached his comfort level yet.

Students were asked to comment on various elements of using the QRP. The remarks on scanning the words with the QRP were generally positive. One student did not like scanning the word multiple times when reading and another complained that he had trouble scanning the words properly. The pace of the response of the QRP was an area of criticism. All students thought it was slow. One student observed, "It needs to pick up the pace!" In addition, the various functions of the QRP received mostly favorable reviews. Only one student thought it was complicated and confusing. The others were able to use the various QRP functions to their advantage.

Last, when asked about the overall ease in using the QRP the remarks ranged from "great, very easy to use" to "difficult" with most students commenting on the ease of use. Most students liked it. One student commented, "it helps for those who cannot read and with spelling and definitions." Another student said he would "definitely recommend it", while a dissenting voice complained that it was "awkward and scanning the words was difficult". Yet another student felt positive about the QRP but said it

would be even more useful if “the dictionary meanings were changed to children’s level so the user can read and use the definition”.

Tutors

Tutors reported that their students used the QRP for assorted reading purposes: adult reading workbooks, short stories, questions in workbooks, personal mail, newspapers, articles on the internet, and large print books. (Sometimes the font was too big in the large print books so the QRP was not useful.) Only one student did not use the QRP because he had undergone cataract surgery, and the QRP was too difficult for him to read.

The frequency of QRP use varied as well. Tutors reported that some used it a quarter of their tutoring time while others used it half the time. Others used it rather infrequently. A number of the tutor-student pairs used it at first and then gave up on it over time.

Tutors were queried about the advantages of the QRP. The responses fell into two themes – QRP features and independence. The features that were cited as most helpful were spelling and dictionary definitions. Moreover, tutors commented that the QRP was helpful for independent work. The QRP was cited as being helpful when “no one else was there and it could be used as a last resort” and “it empowers the students to learn the words they don’t know”.

Numerous disadvantages were noted as well. The dictionary proved to be too difficult for some readers. Scanning was also pointed out as a problem area because some scans generated only part of the word and students were not advanced enough to know if the full word was on the QRP screen. Moreover, the QRP does not scan correctly all the

time so words do not show correctly (i.e. “added” became “odder”, “radio” became “rodin”, “each” became “pasta”, and “those” became “pall”).

Half of the tutors reported that the QRP was easily handled by their students in a technical sense. Their students were able to manipulate the various functions of the QRP with ease. This facilitated the process of both decoding and reading comprehension. But there were difficulties as well. Tutors who reported technical difficulties using the QRP mentioned that it was too bulky which often impeded fine motor coordination. This caused problems scanning words. Moreover, one tutor reported that it was confusing scanning words right to left even though one is supposed to read left to right. Other negative reports focused on the number of scanning trials necessary before the QRP would read the word correctly. Moreover, one tutor reported that her student had trouble scanning words that were in small font.

Half of the tutors also reported that the QRP made their students more independent readers; one said it helped a little and two responded it helped a lot. One tutor remarked enthusiastically, “Ed was a perfect candidate.” Those tutors who did not see value in use of the QRP conveyed feelings of frustration from their students. One tutor worried out loud , “ I do not want him (her student) to get so frustrated that it will impact on the momentum (gained from tutoring sessions)”.

The issue of reading comprehension was queried as well. When asked if the QRP had made a difference the tutors were mixed in their responses. Less than half of the responses were yes and the others said no. Of those who responded in the affirmative, there were remarks such as, “in the past when he came across a word he did not know he would skip it, now he uses the pen (QRP) to get the definition”, and “probably not

comprehension immediately, it allowed him to get through the material and comprehension might be improved over the long run". The four tutors who responded no cited frustration as the key issue. One tutor insightfully remarked that the QRP might aid reading comprehension, but not for her student who was a beginning reader.

Finally, a follow-up question focused generally on the pace of reading mastery and the use of the QRP. Most of the tutors said it did not increase the pace. Examples of responses are as follows: "it did slow down reading because you had to stop, get out the pen (QRP) and turn it on", "not really because you have to scan the word three or four times before the pen reads the words, and the student has forgotten the part of the sentence he has just read", and "actually it has become more of a hindrance because it is time-consuming". One tutor's comments were more global in nature, pointing out her student had made a lot of progress in previous months and she thought the QRP may have helped.

Data revealed a coincidence of student and tutor perspectives. This is probably because students and tutors shared the QRP during their tutoring sessions. There were similar responses to the advantages and disadvantages of the QRP. At the same time the operating problems that were noted for the QRP were also similar in both students and tutors. Tutors were keenly aware of the role of the QRP in the "big picture". It seems that the QRP was a trade-off in terms of its usefulness. Issues of frustration seemed to be noted more by tutors than their students.

Discussion

Without question assistive technology can be an important aid in helping individuals learn to read and be proficient in their reading. Yet in the case of the QRP it can clearly be said that it is not for everyone. (That was evident even with the small sample size of the study.) Both students and tutors echoed that notion. This conclusion seems universal when studying the fit between individuals with learning challenges and a specific piece of assistive technological equipment. In some cases in this study the QRP was nearly perfect in compensating for reading deficiencies. It was a vehicle for confidence and independence. One student said with a smile on his face, "This is going to put you out of business". In fact, it virtually changed his life.

In other cases, the QRP was a source of great frustration and ultimately lead to discarding the equipment. The process of using it technically and practically was too overwhelming and was not helpful at all. Despite initial enthusiasm and hope the QRP simply did not assist nor did it aid.

As in all assistive technology, it is important to observe how the demands for working the equipment is impeded by the learning challenges of students. Noticeably there were issues with the fine motor abilities needed to scan words – figure background targeting, angle and pressure (tactility), and starting and stopping when scanning. There were also memory issues. Working memory was impeded by the amount of time (speed) it took to scan the word and for words to be verbally generated. If several words needed to be scanned there was risk to sentence or passage comprehension.

What makes the QRP unique is its portability. Those in the study who were able to use the QRP effectively and efficiently likened their experience to wearing glasses. In

essence, you take them wherever you go and you see what you want to see. What is unclear at this time is to what extent the next generation of the QRP will clear up some of the problem areas of the first generation (i.e. speed of processing). That is the optimism imbedded in assistive technology. It is also the hope of those who have learning challenges.

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