

Information Literacy and Blind and Visually Impaired Students

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Abstract

In the summer of 2007, as part of the City University of New York PeopleTech Summer Institute held at Baruch College, the author taught a class in information literacy to a group of blind and visually impaired students, using assistive technology to access the resources of the college library. Despite considerable preparation and experience, teaching the class presented unexpected difficulties, detailed in this paper. Rapid advances in information literacy technology present unusual challenges for the average student—challenges that are magnified when the intermediate assistive technology is itself not easy to master. The author explores the pertinent literature.

Keywords: Information literacy, assistive technology, blind and visually impaired learners, Web accessibility

Introduction

In the summer of 2007, as part of a federally funded Department of Education grant known as PeopleTech, I was invited to preside over two instructional sessions teaching the library research process to blind and visually impaired students. The PeopleTech project—a collaborative partnership between the City University of New York (CUNY) Center for Assistive Technology Services at Queens College, the Regional Center for Deaf and Hard of Hearing Students at the College of Staten Island/CUNY, and the Computer Center for Visually Impaired People at Baruch College/CUNY—aims to create an academic infrastructure whereby students with disabilities, with the help of committed faculty, can take full advantage of assistive technologies and other instructional initiatives to access the digitized world (U.S. Department of Education, FY 2005 Project Abstracts). Facilitating universal library access for these students figured as an important objective of the project.

The PeopleTech grant made possible a Summer Institute, available to CUNY students free of charge and to non-CUNY students for a nominal fee. The Institute

ran for four weeks, offering students with disabilities an introduction to and practice with the assistive technology tools that could contribute to their overall college success. The classes focused on four broad training areas: a) computer applications and assistive technology; b) alternative formats for mathematics and science learning; c) self-advocacy; and d) library research. My invitation to join the Institute faculty stemmed from a long collaborative relationship as library liaison to the Office of Disability Services at the College of Staten Island, where for fifteen years I had assisted blind and visually impaired students with their research projects. Despite this preparation and experience, teaching the PeopleTech class presented unexpected challenges. While according to informal feedback the class I taught largely succeeded, difficulties persisted. The students themselves, however, provided valuable insights as to what can and cannot be achieved in such a program.

Literature Review

With the passage in 1990 of the Americans with Disabilities Act (ADA) and the subsequent requirements of Section 508 of the Rehabilitation Act, the 1998 Assistive Technology Act, and Section 255 of the Communications Act, academic libraries began to seriously address the mandates that not only must the library be physically accessible to persons with disabilities, but also that all electronic, information, and telecommunications technologies must be fully available to these clients (Bursa, Justice, Kessler, 2005). The relevant literature of the 1990s focused on issues of compliance with and implementation of the ADA and its implications for the academic library. Germane works include Foos and Pack (1992), Wittkopf (1992), and Crispin (1993).

A second wave of articles took a closer look at actual campus services and programs. McNulty (1999) brings together a worthwhile compendium of these articles. As the technology evolved and more library resources and methods of delivery became Web-based, Web design became a major concern. In particular, problems arose with regard to the visual nature of the graphical user interface and its compatibility with the available technology.

The next major development was the formation of the World Wide Web Consortium and the emergence of the Web Accessibility Initiative (www.w3.org/WAI), which provided a set of Web Content Accessibility Guidelines to help Web innovators come up with effective, accessible sites. In addition, many librarians used software accessibility validation programs such as A-Prompt or the better known Bobby (from the Center for Applied Special Technology) to determine whether a Web page suffered from accessibility and/or compatibility issues (Lazar, Dudley-Sponaule, & Greenidge, 2004). A plethora of books and articles appeared discussing the Internet and accessibility issues, most notably Mates (2000) and Guenther (2002).

Awareness of the issues has grown, and software developers have made major strides in producing accessible resources. However, the interactive nature of Web 2.0 as well as visual non-text content in general still pose barriers that educators must address. The Spring 2007 *Library Trends* (Brazier & Owen, Eds.) devotes the entire issue to library services for visually impaired persons. Other research studies have shown that though a digital resource may be hypothetically accessible, navigational difficulties may persist for blind and visually impaired users, thus making the distinction between *accessibility* and *usability* an ongoing issue (Brophy & Craven, 2007).

Although the literature on the topic continues to grow, very little research accompanies it pertaining to the actual *teaching* of information literacy skills to the disabled population. An early article by Graubert (1995) describes sensitivity awareness training and special library instruction sessions for the library staff conducted at the University of Missouri-Kansas. These sessions included exercises in how to perform pertinent computer functions on the adaptive equipment. (Graubert notes that although the entire reference staff attended these sessions, few of the blind and low vision students who were also invited showed up.)

The article most pivotal to the topic, however, is Rike (2003), relating to part of a project at Western Michigan University. Rike suggests that librarians foster a team approach when teaching information literacy skills to blind students in a group setting. A more recent project known as VIKO (Kvale & Buset, 2007) discusses the prospect of transforming a learning tool (Web tutorial) based on information literacy modules into an accessible teaching resource.

Assistive Technologies

With the digital information explosion, information literacy for students assumes paramount importance. Whatever their discipline, whatever they do later in life, students will find themselves seriously deprived if they do not acquire a working knowledge of the tools, methods, and instruments of the new information technologies and the relevant information literacy competencies needed to take advantage of them.

By definition, “assistive technologies” include both hardware and software that enable blind and visually impaired persons to read print, use a computer, take notes, and communicate via paper and email. Persons so challenged can thus gain access to information from library catalogs, databases, and Web sites, and therefore participate in the research process in ways never before thought possible. Although many available technologies can accomplish these goals in one way or another, this paper confines the discussion to two programs, the acronymed JAWS (Job Access

with Speech) and ZoomText. JAWS is a screen reader with voice synthesis. ZoomText comprises screen magnification software. Both technologies are compatible with Microsoft Windows applications.

JAWS

JAWS enables a visually challenged individual to interact with the computer in the same way a sighted individual would. In an instant, most of the catalogs and databases that constitute the gateway to the various library resources become readily accessible.

Mastering the program, though, may not come easily. Familiarization and facility of use require a good deal of practice and training over time. JAWS, when used in conjunction with a browser such as Internet Explorer, will provide the challenged user with a very detailed explanation of the design and structure of the Web page. If the user is new to the page, he or she may have to listen to a reading of the entire page in order to get an adequate sense of its structure; otherwise only relevant parts need be listened to. Specific navigational key strokes and commands activate the JAWS voice, which announces links, headings, tables, lists, and other features found on the page displayed. In the case of graphics and images, the voice can speak the descriptive alternative text (alt-text) if that text has been properly provided in the design of the page. In addition, quick navigation keys permit the user to enter text such as search terms into the blank field boxes.

With certain control elements such as combo boxes and pull-down menus, the JFW (JAWS for Windows) voice announces the required operational function and available choices. For example, in a field such as *publication type* in the database Academic Search Premier, the voice will provide specific contextual information by announcing the various possibilities. By hitting the *up* and *down* arrow keys, the user will hear *all, periodical, newspaper, book, primary source document*, and so on.

While the navigational capabilities of this technology are quite remarkable, its use in practice can present unexpected difficulties. Training over time is obligatory—moreover, each new version of the program issued requires further training (Craven & Brophy, 2003, as cited in Brophy & Craven, 2007). Screen readers read horizontally and move from top to bottom. Frequently the pages being examined are organized in such a complex, counter-intuitive manner that even the experienced user will have difficulty using the tab key in order to find the information sought. Pages with many links and layers, or very long pages, can become extremely time consuming to navigate. In many instances, insufficient alt-text for graphics, images, and icons can make the information provided meaningless. Although accessibility to PDFs (Portable Document Format pages) has improved over time, some navigation issues remain (Brophy & Craven, 2007).

ZoomText

ZoomText is screen magnification software that integrates voice synthesis with enlarged text and graphics. Text can be magnified up to 36 times, in flexible steps. The user controls reading through keyboard commands or by moving the mouse over text. The user can display the screen as full with overlays, as a split screen, or in other ways. Other features allow the user to scroll the contents, zoom in and out, change the screen colors, and so on. Many students with a progressive visual impairment begin using this technology. However, as vision deteriorates, magnification alone may not suffice, and it becomes difficult to read or interact with the computer. Instructors often advise students in this situation to move on to using JAWS, but this is not an easy leap emotionally or cognitively.

Disabled students are urged to learn the basics of computer use with JAWS outside of the college library and the respective campus disability services office. In New York State some of the institutions offering the necessary training include the New York State Commission for the Blind and the Jewish Guild for the Blind. A technical staff person working in the campus disability services office may then help the student further refine his or her computer skills. Interested students may also attend computer classes at the Computer Center for Visually Impaired People at Baruch College/CUNY. Often, training in the use of these technologies becomes the responsibility of the librarian (Adler, 1999, p.174). In my case, I received training from the CUNY Center for Assistive Technology Services at Queens College, which complemented my years of working one-on-one with blind students.

Information Literacy Sessions

The information literacy class I conducted as part of the 2007 PeopleTech Summer Institute consisted of two three-hour sessions separated by a week. The sessions took place in the computer lab of Baruch's Computer Center for Visually Impaired People. Eight students enrolled. The students were either blind or dealing with a significant visual impairment. Of the eight students, six were JAWS users and two worked with ZoomText. Both programs were loaded on Dell computers running Windows XP. They had learned about the program through their campus disability services office, the Baruch computer center, or a notice placed on the CUNY portal. All the students except one were registered at a CUNY campus, whether a senior or community college. Baruch, New York City Technical, Hostos, Lehman, Hunter, and Bronx Community were represented. The one non-CUNY student came from a college in upstate New York.

The students found themselves at different stages in their academic careers—freshmen, sophomores, juniors, and those about to graduate from a two-year program. Their familiarity with the technology varied. Having had no contact with the students prior to the first session, I worried about their skills and comfort level in using the assistive technology software. Presumably they were attending the Institute for the purpose of improving those skills. Fortunately, a tutor, blind himself, and two members of the grant team (one of them the project director, blind as well), all well-versed in the technology, were present at all times to take care of them.

I did not know anything about the students' prior use of or experience with their campus library resources or with other library collections in general. Unlike students in other library information literacy classes—those integrated with course content in a specific discipline—these students shared neither a common major nor area of interest nor even level of competence. In short, it was a heterogeneous group. In my opinion, the students did, however, constitute a learning community (Harris, 2008), by virtue of their having been brought together not so much by their disability as by the use of the assistive technologies.

According to the ACRL Information Literacy Competency Standards for Higher Education (2000), information literacy “enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their learning” (p. 2). Information literacy can promote independent critical thinking skills and help sustain life-long learning for a constituency of students who for the most part had been compelled to rely on others to find and evaluate the information they sought. Here then was a clear statement of goals for the class. Even if we did not immediately achieve these goals, at least they indicated a pathway. If students left the class able to define a research objective and go about looking for the information the research called for, I would have felt that I had accomplished something significant and lasting.

The class was titled “Understanding the Library: The Undergraduate’s Best Friend.” I began the class by asking the students to say something about themselves, their academic interests, their experience with assistive technologies, and their use of the library. I devoted the first session to teaching library basics such as how books and other material are located and accessed, how to analyze a research topic, and how to generate search terms. The second session focused on database searching, including instruction about Boolean logic, types of articles, evaluation criteria, and citing sources. In all, I presented ten modules, organized into a PowerPoint presentation (available to the students through the Institute’s Web page). I made the presentation accessible via JAWS by removing some animation and providing alt-text to explain the concept of Boolean indicators.

To render the instructional experience effective for this community of learners, I could not rely on the usual method of instruction—namely, lecture followed by hands-on interactive exercises (a method that has in fact been losing ground for instructing *any* group of information literacy learners). I needed to create a learner-centered active instructional experience that would, I hoped, lead to collaborative and critical thinking. In this I was applying the counsel of Kenney (2008), who argues that the effectiveness of a one-shot instruction session is enhanced by a stratagem of problem-based learning. I wanted to create an experience that these students might actually encounter in the library or working on their home computers. After a short discussion, I would provide active learning exercises, small tasks to reinforce some of the concepts previously discussed—for example, finding a book on a certain topic, generating search terms for a given statement, or finding journal articles using keyword or subject-heading searches.

Observations

I conducted the class as a guide and facilitator. I walked around the room listening to the cacophony of synthesized voices, each speaking at a different rate; these voices formed a counterpoint to the ensuing spontaneous student discussions. The experience was indeed collaborative, the different forms of verbalizing producing a symphony of organized chaos.

After a few exercises I was able to determine that some students were engaged and participating effortlessly in the class experience. Other students were having a rough time of it. They needed the help of the tutor because they had either forgotten a particular keyboard command or were tactilely missing the key they needed to press in order to activate the necessary computer function. Even the more fluent students needed extra time for certain exercises. Thus I found myself taking direction from the students as to how much time to allow for respective parts of the instruction, and I devoted less time to some topics than I had planned.

During the exercises I also perceived that students were encountering not only conceptual difficulties such as how to narrow down a topic, but difficulties in acclimatizing themselves to the screen. Sometimes students were not able to locate something as basic as the search button because of the design complexity of the screen. Unfortunately, some screens that go out of their way to be friendly to sighted users can overstep the bounds of what can be “read” by assistive technology users. Software designers might try to keep this in mind.

Students found the module on analyzing and refining research topics particularly engaging. I asked the students to differentiate between a topic and a subject—a distinction that I had picked up many years ago from a teaching manual. For example, the topic of drugs can be considered from different subject fields, such as

education, nursing, business, sociology, or psychology. The question led to a lively discussion. (How gratifying it was to hear one of the students say, “I never thought of information that way!”)

The three-hour duration of each session worked quite well, because the students needed this time to navigate the screens and to place text into the search field boxes. Though Rike (2003) cautions that “[i]n no case should a session of longer than two hours be attempted,” (p. 162) I found the students eager to continue even after three (of course there had been a short break during the period). Of the eight students in the class, six were obviously following the presentation and were deeply engaged. The project director told me afterward that the technology had proved overwhelming for the other two students. (Rike also recommends that, if the numbers warrant it, JAWS classes and ZoomText classes should be given separately, but this was not the case in my class.)

Conclusion

Although I have worked for many years with individual students having a disability, including blind and deaf students, I was not prepared for the emotion that presiding over a class of blind and visually impaired students engendered. I often heard visually impaired students referring to the library as “intimidating”, as an unfamiliar, inaccessible place can be. After this class, the library would no longer be that kind of place. These students had now joined their sighted peers.

Yet the class suffered from a lack of time. Given what we accomplished in the first two meetings, a third would have been well worth the time invested. You might say we were just getting started. It might have been possible to combine a third meeting with a class on self-advocacy, one of the three other programs of the Institute. Such a class could have been based on the instructional model of problem-based learning, whereby students present advocacy issues pertinent to themselves. Apparently in the self-advocacy class, one of the students rhetorically asked, “Now that I’ve come this far, how do I find out how to vote in the presidential election?” (This was only the summer of 2007, but we had a politically engaged student at hand!) That, for example, would have been an interesting research problem, well within the capabilities of most of the class. Similarly, a plan to create an Institute-related blog on which the students could have shared a collaborative space for four weeks (or even more) was never implemented. Among other things, the blog would have made for a more integrated total learning experience. (The project director told me that he dropped the blog idea on grounds that the students were not yet ready to manage one—a shame when you think of the benefits of a lively blog site.)

Still, I had to accept that there would be students for whom the dual demands of the program—first, learning a new technology, and then, learning what that technology

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reveals—might prove beyond their immediate capabilities. For these students, a one-on-one approach might prove more effective. For those students moving on to more advanced programs of study in a particular discipline, I recommend an information literacy class or two in the specialized vocabularies and resources relevant to that discipline.

The value of the library sessions, to my mind, proved indisputable. Though we made no formal assessment of the Institute classes, they may provide a model for the future, in which case such an evaluation should at some point be done. The initiative for holding further classes rests with many. At the campus level, a library liaison should work closely with the office of disability services. At the university level, LACUNY (the Library Association of the City University of New York) maintains a Disability Services Roundtable that can further explore these concerns. The ALA forum on Academic Libraries Accessibility and Disability Services can address these issues on the national level.

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