

A Survey on Library Services and Adaptive Technology Solutions for Users with Disabilities – An Example: The Library and Documentation Center of Trakya University

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Abstract – As it is known, in developed countries regulations and laws prohibit any kind of discrimination against people with disabilities in employment, communications, public accommodation, transportation, and governmental activities. Therefore, those regulations and laws have prompted both public and university libraries to evaluate services to their users and have brought forth a large number of resources on services to users with disabilities. This paper examines the current literature and presents a case study of the Library and Documentation Centre of Trakya University' efforts to understand and meet the needs of users with disabilities. Mainly, the case study is concerned with the establishment of novel approaches and adaptive technologies to meet the needs of visually impaired, blind, and learning disabled students, and on the ongoing efforts to improve the level of awareness among library staff. In addition, it identifies research challenges and presents future research directions.

Index Terms – People with disabilities, Library services, Staff awareness, Adaptive technologies, Research challenges, Future research directions.

1. INTRODUCTION

The Americans with Disabilities Act (ADA) is a civil rights law enacted in 1990. It prohibits discrimination against people with disabilities in all areas of public life and private places open to the general public and thereby makes sure that people with disabilities have the equal rights and opportunities as everyone else [1, 2]. Later on, the Americans with Disabilities Act Amendments Act (ADAAA) was signed into law in 2008 and became effective on 1 January 2009. It made some remarkable changes to the definition of disability. As well as the ADA, in recent years, laws have become effective in other developed countries to prohibit discrimination with respect to people with disabilities. Hence, in the last decade, libraries have been prompted to evaluate services to their users and have created

many resources on these regulations and acts and on services to disabled users [3]. It should be taken into account that to maximise their potential, by identifying problems that are faced by libraries for the provision of library services for people with disabilities and presenting appropriate solutions, users must be given adequate access to the information and services offered through libraries.

Although most studies cover other disabilities such as hearing and mobility impairment, in libraries visually impaired users are the most disadvantaged since they are not able to read printed materials. In this paper, we mainly review solutions and applications that can be used by library users with disabilities and investigate prospects and research challenges. Moreover, we try to expose best practices and model programs as well as techniques and strategies for improving library services. The rest of this paper is organised into the following sections. The second section outlines the background information about the characteristics and difficulties of people with disabilities, the integration of users with disabilities, and the development of library services for people with disabilities till the present. The third section presents the case study. The fourth section is devoted to research challenges. The fifth section focuses on future research directions. Finally, the last section draws conclusions. Throughout this study, the emphasis is to create awareness among library staff and professionals working in this field about the need of library services for users with disabilities.

2. LIBRARY SERVICES FOR PEOPLE WITH DISABILITIES AND RELATED WORK

Although in the past, people with disabilities were mostly excluded from employment, education, and various community activities, in the last two decades we witnessed the integration

of people with disabilities into mainstream society [3]. In this respect, library services for users with disabilities play an important role. In the last decade, The ADA had an important impact on the way libraries serve. In 1991, the Association of Research Libraries surveyed its members to determine the effect of the ADA legislation [4, 5]. The survey showed that the most common services provided to users with disabilities are photocopy assistance and retrieval of materials from the stacks. However, less attention is paid to the use of adaptive technology, which allows library users with disabilities to search an online catalogue and databases. In addition, it was revealed that there is not enough coordination with library services and only a few libraries took the action to assign responsibility for disability services to a specific library staff.

In libraries designed to accommodate the needs of people with disabilities, spaces designated for use by the disabled with a valid university tag are provided. In this way, long-term or daily parking is permitted in the specific parking spaces allocated to the disabled. All of the halls must be wheelchair accessible and ramps and automatic doors must be located at the entrances to the halls. In addition, some entrances may require use of the handicapped access lift or elevators. In terms of access to library materials, material retrieval services must be available for inaccessible portions of the stacks and for users with disabilities. This way, a user who is not able to access the book stacks may request that circulating library materials found in the book stacks be retrieved and brought to the most suitable library location for the user. Similarly, for users with mobility-related disabilities, a deputy borrower may be designated or library books may be renewed via phone. Pay-for-print for photocopying and printing from computers is highly useful in most cases, although some libraries allow users with disabilities print free of charge in adaptive technology labs if the users provide their own paper. Users with disabilities may seek assistance to operate a printer or copier. In those cases, depending on staff workload, the library staffs assist with a reasonable number of requests for printing assistance or fill out forms for users unable to do so by themselves. Mobile furniture such as adjustable height tables, whiteboards, and mobile chairs must be available throughout the library. All of the library locations must have wheelchair-accessible and adaptive technology-available workstations or at least first floor computer workstations must have wheelchair height tables. For security related reasons, access to the adaptive technology workstations mostly requires a valid username and password.

Library websites must be designed to provide efficient access to information. Although some legacy materials not yet fully compliant with established guidelines for accessibility may exist, library web pages and resources must be reviewed for established guidelines for accessibility.

In some libraries designed to meet the needs of users with disabilities, users can use the electronic/web retrieve from shelf

services to have print materials delivered in electronic form if appropriate or to one of the library service desks for pick up. However, the amount and type of library material that may be delivered in electronic form via these services are typically limited by staff availability and the requirements of copyright compliance.

Adaptive technology available on designated workstations allows print materials be magnified or scanned. However, some rare and fragile materials cannot withstand use on adaptive technology workstations and some restrictions may exist on their circulation. Then, the aid of a reader may be needed for such print materials. Nevertheless, most libraries do not provide reading services for those cases due to the limited number of staff.

In adaptive technology labs, wheelchair accessible workstations and/or adjustable stations must be available. In addition to allowing access to library homepage and the Internet, the adaptive technology labs contain various assistive devices. In most adaptive technology labs, there are desktop video magnifiers or Closed Circuit Televisions (CCTVs), used to enlarge texts for reading purposes and Microsoft's accessibility accessories are available in all of the computers. Other accessibility equipment and technology solutions found in adaptive technology labs are:

- Windows workstations with fully integrated magnification and reading programs tailored for low-vision users such as Window-Eyes screen reading software [6], NVDA (NonVisual Desktop Access) screen reader [7], JAWS (Job Access With Speech) screen reader [8], and ZoomText screen reading and magnification software [9];
- Apple computers with their built-in screen reader,
- Speech recognition software such as Dragon Naturally Speaking [10];
- Text to speech software such as TextAloud [11], Kurzweil 1000 [12];
- Desktop video magnifier/CCTV system, a reading aid for people with low vision that maximizes the remaining sight so it is possible to read and view materials again;
- Telephone/Telecommunications Device for the Deaf (TDD), a telecommunications device for the deaf which has a standard keyboard and LED/LCD screen to display electronic text and enables hard of hearing, deaf, or speech-disabled people to utilise a phone [13];
- Braille printer, an impact printer which renders text as tactile Braille cells;

- Braille display with a keyboard (Braille terminal), a device which allows blind people to read the contents of a display one text line at a time in the form of a line of Braille characters;
- Braille displays with a screen reader such as Narrator [14];
- Comprehensive software suite for struggling students to improve their reading, writing, study, and test taking skills such as Kurzweil 3000 software suite for Windows [15];
- Video Relay Service (VRS) / Video Interpreting Service (VIS), a video telecommunication service which allows hard of hearing, deaf, or speech-

impaired people to communicate over video phones with hearing people in real-time;

- Products designed for people of all ages who are blind and visually impaired.

As well as the abovementioned solutions, computer-based readers with a scanner and printer, large print encyclopaedias, large print dictionaries, talking/audio books, music for hire, books and music in community languages, basic skills materials, e-magazines, e-books, and e-audio can be found in almost all of the libraries designed for people with disabilities. Table 1 briefly gives a list of commonly used adaptive technology solutions available to meet the needs of users with disabilities.

Software/Application/Tool	Function	Target Group
Window-Eyes [6], NVDA [7], JAWS [8], Narrator [14]	Screen reading	Low vision or blind users
ZoomText [9]	Screen reading and magnification	Low vision users
Dragon Naturally Speaking [10]	Speech recognition, to control a computer by voice with speed and accuracy	Low vision or blind users
TextAloud [11], Kurzweil 1000 [12]	Text to speech, to help people with reading disabilities improve reading and comprehension by listening to text while viewing it, and convert text into speech for people with visual impairment	Low vision or blind users, people with reading disabilities
TDDs	To enable hard of hearing, deaf, or speech-disabled people to utilise a phone	Hard of hearing, deaf, or speech-disabled users
Braille printers	To render text as tactile Braille cells	Blind users
Braille displays with a keyboard	To allow blind people to read the contents of a display one text line at a time in the form of a line of Braille characters	Blind users
Kurzweil 3000 [15]	Educational and assistive technology solution to provide reading, writing and study support	Students who struggle with literacy
VRSs/VISs	To allow hard of hearing, deaf, or speech-disabled people to communicate over video phones with hearing people	Deaf, hard of hearing and speech-impaired people
Desktop video magnifier	To make text easier to read by magnifying	People with low vision

Table 1 A List of Commonly Used Adaptive Technology Solutions for Users with Disabilities

3. AN EXAMPLE: THE LIBRARY AND DOCUMENTATION CENTER OF TRAKYA UNIVERSITY

Library services in the Central Library of Trakya University, located in Edirne, Turkey, are tried to be given considering the needs of all users. Orientations to the traditional and electronic information services are available in all the library buildings of Trakya University. The library staffs work hard and do their best to offer a welcoming environment to all of the users and already recognise that not all materials associated with the library services are accessible to all of the users. Hence, although the circulation desk is responsible for checking out of library materials, reserve materials, and interlibrary loan, assistance is provided to promote accessibility, especially in the area of reference services and research. All users of the library may renew their books either over the phone or online.

The library concerns the safety of users with disabilities. Hence, Braille and tactile signs are available on all the elevators, escalators, and toilets. Procedures that take the proper evacuation of users with disabilities into consideration are in the evacuation plan of the library. In the Central Library shown in Figure 1, there are ramps at the entrance of the library and at the entrances to reading halls on the ground floor. At the entrance level of Block B, there is a handicapped toilet for ladies and men. Two elevator installations have been completed in blocks A and B to ensure that disabled users benefit from library services provided in the rooms located on the upper floors of blocks A and B. Although all of the library staffs assist and guide users with disabilities in accessing resources, in the library, a librarian is specifically responsible for users with disabilities. The librarian serves as a contact person for students with disabilities by phone, appointment, or via e-mail and encourages the use of the library by users with disabilities. Research assistance is provided by appointment, in person, via email or phone. The librarian also provides research assistance and feedback on library services or policies related to users with disabilities. Another responsibility of the library is to increase staff awareness about users with disabilities.



Figure 1 The Central Library of Trakya University

There is a computer on the ground floor of the Central Library that receives catalogue scanning and internet service for the use of disabled users. User with disabilities can perform catalogue

browsing and internet transactions using this computer. The library subscribes to many electronic resources provided through a number of publishers and commercial vendors. However, some of the resources were not designed for maximum accessibility. Hence, users who require assistance can contact the library staff to get help to access these materials. In the Periodicals Room, accessibility technology with an emphasis on blind and low vision is available. In the room, there is a computer with JAWS program installed, which is a specially designed screen-reading program to enable the visually impaired to use the computer. Thanks to the JAWS program shown in Figure 2, which allows all the writings, menus, frames, buttons displayed on the computer to be played as soon as the computer is turned on, the visually impaired can easily write on the computer, follow private notes and notes, send and receive e-mails and take advantage of all the possibilities of the Internet.



Figure 2 A JAWS installed computer in the Central Library of Trakya University

The library allows CDs and DVDs to be borrowed free of charge by users with visual or hearing impairment. Moreover, the library is planning to establish home library service. With this service, users with temporary disabilities can contact the library and request the service. To deliver the service, the library will get the help of its regular users who will act as volunteers. The volunteers will contact the users who demand the service and find out the users' requirements. Then, the volunteers will agree with the users' frequency of their visits and the number of library materials that the users would like. If additional help or information is needed between visits, the library staff will help the users if they are called.

Although in recent years many steps have been taken by the university management and the library staff to meet the needs of students with disabilities, there are still a few things to do. Thanks to the increasing awareness, every day new approaches are proposed to address the needs of people with disabilities,

and novel solutions are developed to meet them. We should never forget that continuous improvement should be the first priority of libraries.

4. RESEARCH CHALLENGES

As compared to the general student population, students with disabilities require special convenient access to library services. In spite of the special needs requirements, there is consensus among researchers that access to library services by students with disabilities is not yet fully available, especially in countries in the global periphery [16]. Equal access for all users to every library can only be provided if both the physical condition of library buildings and library services are taken into consideration [17]. For this purpose, well-known checklists such as the one developed by the IFLA Standing Committee of Libraries Serving Disadvantaged Persons (LSDP) can be highly useful. The IFLA checklist was designed to evaluate existing levels of accessibility to buildings, services, materials and programs of all types of libraries and enhance accessibility where needed [17]. On the other hand, some improvements require significant economic resources.

In most cases, the convenience and accessibility of library services for students with disabilities is evaluated using quantitative data collected through questionnaires directed to students with disabilities, interviews with the library staff responsible for the disabled students unit and observations using the IFLA checklist for access to libraries. On the other hand, even if a purpose-built library service unit which complies with international best practice was in place is established for students with disabilities, students with disabilities are not adequately satisfied with the library services they receive since very few library materials are in accessible formats. The situation is compounded by the fact that in most libraries only one librarian is assigned to manage and run the library services for users with disabilities. It is recommended that the university should hire more library staff to assist students with disabilities in the audio-Braille library [18, 19].

5. FUTURE RESEARCH DIRECTIONS

It is recommended that representatives from different disability groups and support organisations should take part in the assessment processes. In this way, along with the checklist findings, inputs from these individuals may provide more useful information for both immediate improvement measures and future planning [19]. Since libraries and their buildings are highly different around the world, quantitative measurements should not be included in the checklists and the relevant laws and regulations in each country should be applied. Since significant changes take time, we need to focus on the most important issues in the development of the checklists.

We recommend that feedback and suggestions on designing a more accessible, transparent and seamless library environment can be built should be collected. Importantly, sources of

information wished to be used are not mostly in an accessible format for users with disabilities. Hence, it is desired that library staff should work with users with disabilities in obtaining needed and requested materials in an accessible format. If not available, a coordinator for users with disabilities should be assigned and he/she should arrange a convenient time to obtain copies of desired library materials in the requested format or find out alternative ways to make those materials accessible.

6. CONCLUSION

In the last decade, libraries have started to evaluate their services so that they can meet the needs of users with disabilities. However, equal access to use libraries is not yet possible or even expected for people with disabilities in many countries. Moreover, libraries are reactively rather than proactively making changes to services for people with disabilities.

In this paper we examined the current literature in order to identify the progress on the status of library services for people with disabilities and presented a case study of the Library and Documentation Centre of Trakya University' efforts to meet the needs of users with disabilities. With the case study, the use of adaptive technologies to meet the needs of visually impaired, blind, physically impaired and learning disabled students was explained and ongoing efforts to improve library staff awareness were presented. As explained in the paper, all the librarians at Trakya University do their best to provide high quality service to the library users. Moreover, within the parameters of its policies, the library tries to do its best to meet the needs of users with disabilities on a case-by-case basis.

It should be remembered that it is our responsibility to make people with disabilities feel welcome in the library. Although in recent years free Internet and email with speech, large text and adaptable furniture and catalogues with large print option have become very common, university libraries should collaborate with campus community to ensure welcoming environments, user-centred learning experiences, and accessible information resources in order to facilitate scholarly inquiry and prepare users to be engaged members of their local, regional, and global communities.

In each unit of libraries, a library staff must be available to retrieve materials for users with disabilities. When the users ask the needed material, the staff at the service desk must try to retrieve the needed material as soon as possible. On the other hand, if there are many items to be retrieved, beforehand notification might be required or during the extremely busy hours, the user may come back later to take the needed material. It is advised that users that require assistance for retrieving materials from the library stacks should prepare a list of the needed materials and use the online catalogue to determine that the needed materials are available for circulation. Finally, it is

highly recommended that policy makers should include people with disabilities in information access and collection development policies. In addition, a study on the needs and academic progress assessment of users with one group of disabilities is recommended.

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