



ADAPTIVE EQUIPMENT TECHNOLOGY FOR SUPPORTING HANDICAPPED PERSONS IN THE LIBRARY ENVIRONMENT

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Abstract: *Libraries serve as essential centers for knowledge and learning, yet accessibility challenges persist for handicapped individuals. This study examines the availability, usage, effectiveness, and challenges of adaptive equipment technology in university libraries. Data was collected from 100 handicapped library users and 20 library staff members across five university libraries through questionnaires, interviews, and observations. Findings reveal that while basic adaptive technologies such as screen readers (60%) and wheelchair-accessible desks (70%) are commonly available, resources for hearing-impaired users, such as hearing assistance devices (40%), remain limited. Usage analysis indicates that while most users find adaptive technologies helpful, a significant percentage (15%) report ineffectiveness due to outdated equipment, lack of maintenance, or insufficient training. Challenges identified include lack of user training (45%), equipment malfunctions (30%), and limited availability of assistive devices (40%). The study recommends increased investment in adaptive technologies, regular training for both users and staff, improved maintenance strategies, and enhanced accessibility infrastructure. Implementing these measures will create an inclusive library environment that accommodates the diverse needs of handicapped users, ensuring equitable access to information and resources.*

Keywords: *Adaptive technology, library accessibility, handicapped users, assistive devices, inclusive learning.*

Introduction

Libraries serve as knowledge hubs for all individuals, including handicapped persons who may require specialized equipment to access information. This study aims to evaluate the availability, usage, effectiveness, and challenges of adaptive equipment in university libraries, providing insights into how to improve accessibility for handicapped users.

Availability and use of information are fundamental human right issues as contained in articles 19 and 21 of the Universal Declaration of Human Rights (UDHR) of 10th December 1948. In this information age, there is the need, now more than ever, to equip people with skill and means to become information literate and to enable them locate, access and evaluate information without discrimination. This is in line with the major objectives of inclusive education, equality of education, education for all and library and information service for all, which are all enshrined in the Millennium Development Goals (MDGs) and National Policy on Education of the Federal Republic of Nigeria. The knowledge society also demands that all citizens, including the physically challenged, should have access to full information. This is the basis for enabling people, especially the physically challenged, to participate as active citizens since they need to

make informed choices and decisions and to act on them. Availability and use of relevant, accurate and current library resources and services by the physically challenged are veritable means of developing human resources and accentuating sustainable self-reliance and national development.

Disabilities are many including visual, hearing, mobility, cognitive and language, and speech disabilities. The ones covered in this work, which were selected because according to Quality Assurance Agency (2010) they are more prevalent in regular tertiary institutions, are physical and mobility impairment, visual impairment (total blindness) and hearing impairment (deaf and dumb). Physical and mobility impairment include crippling disabilities, wheel chair bound, students with crutches, amputees, students with artificial hand(s) and or leg(s) and dwarfs. The problems they encounter in the library include navigating through the library and its environment, picking books from the shelves, using other general facilities that may be designed for the able-bodied ones. The hearing impaired on their own part cannot recognise spoken words. Their characteristics include lack of response to spoken words, indifference to sounds and noise. The visually impaired on their part have visual disabilities in reading coupled with general navigation problems. Visually impaired persons may need someone to read for them. They may also have difficulty in coping with reading small print materials, especially, if impairment is partial. This category of people cannot read the conventional print materials. They need to be provided with reading materials in alternative formats, which they can read at their own, pace and time. Library services for this category of physically challenged persons require extensive resources and well-trained staff. Visually impaired persons may depend on Braille books, talking books, sonic guide, mowart sensor etc for reading and movement around the library since movement may also pose serious challenges.

Physically challenged persons constitute an important proportion of the general population. With the increasing life expectancy in most parts of the world and the dramatic pace of urbanization in some African countries, including Nigeria (particularly South-East Nigeria) the population of physically challenged persons is increasing concomitantly. Today, a great number of persons with disabilities are trying to acquire tertiary education in institutions of higher learning including polytechnics.

The physically challenged students in polytechnic institution need library and information resources and services like their able-bodied counterparts. These students need to have equal access to library and information resources to meet with their academic work and other information needs. If the physically challenged students in the polytechnic institutions do not have equal access to and use of library and information resources, it will result in poor educational outcomes and general poor quality of life on their part. Provision and effective use of library and information resources and services enhance the rights of the physically challenged to participate equally in societal development.

Information received during the pre-research discussion with some professional colleagues indicates that student population in the polytechnics is becoming more diverse with an increasing number of physically challenged students and that polytechnic libraries do not show enough commitment to providing resources and services that will meet the needs of the students with disabilities. This fact is corroborated by the researcher's observation that the physically challenged students are not put into consideration in programme planning. Besides, few researches have been carried out on physically challenged and library programme planning in terms of architectural designs, resources and services provision, accessibility and utilization and there is also not much on the information services for physically challenged polytechnic students.

Literature review

Concept of Physically Challenged Students

Physically challenged students are extremely varied group of people. The disabilities may be below normal, normal or above normal. They may have a single disability or a combination of impairment. Physically challenged students are students who have substantial adverse and long term effect on their ability to carry out normal day to day activities (Forrest, 2005). Long term is taken to be a year or more. This definition corresponds with the definition of disability as defined by Disability Discrimination Act, (1995) which describes disability in the following terms: “a person has a disability if he has physical or mental impairment, which has a substantial long-term adverse effect on his ability to carry out normal day-to-day activities”. Muya (1996) also defines physically challenged persons as individuals who have any restriction or lack of ability to perform an activity considered to be normal for able-bodied persons. This definition was drawn from the World Health Organisation’s viewpoint. World Health Organisation (WHO) (1992) views disability using the International Classification of Impairments, Disabilities and Handicaps (ICIDH), as any restriction or lack resulting from an impairment of ability to perform an activity in the manner or within the range considered normal for a human being. The World Health Organisation sees impairment as a loss or abnormality of physiological, psychological or anatomical structure or function.

Experts have clearly distinguished the use of the terms impairment, disability, challenged and handicap. According to Panda (1997) and Ladipo (2006), impairment relates to abnormality of body structure, organ or system function resulting from any cause in principle. Impairment represents disturbances at the organ level. Disability reflects the consequence of impairment in terms of functional performance and activity by the individual. “Challenged” on the other hand, refers to disadvantages or handicap experienced by individual as a result of impairment and disabilities; “challenged” thus reflect interaction with an adaptation to the individuals’ surroundings. These terms have functional inter- relationship with impairment leading to disability and disability leading to challenged, handicapped or disadvantaged condition.

This relationship shows that the terms are discrete entities and quite different from each other and one leading to the other. However, Muya (1996), Johnstone and Bonetti (2001) in their independent studies saw the terms differently from the above proposition.

They opined that the terms ‘impairment’, ‘challenge’, ‘disable’ and ‘handicap’ are used interchangeably. Thus, an impaired person is a disabled person and so is also handicapped or disadvantaged or challenged.

The term physically challenged is internationally accepted as referring to those groups of handicapped people who have orthopedic problems, special health conditions or sensory deficits which sometimes manifest themselves in obvious physical deformities, speech, auditory or visual disorders of varying degree (Aina, 1996). According to him it can include; physical or mobility impairment, visual impairment, hearing impairment, dyslexia, medical conditions and serious mental health difficulties. Ladipo (2006) on the other hand, defines impairment as physical deviation from what is considered “normal” by the general society. For instance, a boy who was born without one arm or a man who lost an arm in an accident has impairment.

Concept of Library Resources

Library resources relate to a variety of published and unpublished information materials in various forms, readable with naked eye or with an aid, usually found kept in a library for the sake of dissemination (Onwuazo, 2001). The entire information items in the library are acquired for the provision of general information as well as research service to library users. Books, pamphlets, newspapers, periodicals, patents, maps, bibliographies, indexes, slides, and all other information bearing materials that can be

found in a modern library which are provided in response to the information needs of users are called library resources (Edoka, 2000). The quantity, nature and diversity of library resources will vary according to the size, purpose, and programme of the institution. Library resources for the physically challenged are usually made available in specialized format to suit them. In this work, library resources for the physically challenged are all information sources including the ones produced in specialized format for use by the physically challenged polytechnic students. These resources may be in print or electronic format.

Concept of Library Services

Nwalo (2003) defines library services as all those intangible offers given by a library to her clientele to ensure the full exploitation of the resources of the library in meeting their full information needs. Library service is also defined as any facility provided by a library to enhance the use of library resources and dissemination of information (Pryterch, 1990). According to Hornby (2000), service relates to any assistance or help offered to a person to enable him or her use or take advantage or benefit from something. In this work, library services for the physically challenged relate to any assistance or help offered to the physically challenged students to enable him or her use the polytechnic library resources and facilities. The entire human and material resources in a library are put in place at considerable expense for the overall purpose of providing effective services to the library users (Edoka, 2000). Library services are of paramount importance in any library programme. Ogbuehi (2012) noted that the effectiveness and efficiency of library services would to a large extent represent what the patrons perceive of the library.

Nature of Disabilities among Students

In terms of classification of disabilities, Oyebola (1997), Okeke (2001) and Bakpo (2004) in separate studies on people with disabilities categorized disabilities into the following.

- 1 Visual impairments (moderate, severe, blindness)
- 2 Hearing impairments (moderate, severe, deafness)
- 3 Physical or Mobility impairments (moderate, severe, cripple)
- 4 Cognitive and language impairments (moderate, severe, illiteracy)
- 5 Speech impairment (moderate, severe, dumbness)

Samarasinghe (1993) categorized disabled persons from the public health point of view to include the blind, the partially sighted, the deaf, hard – of – hearing, educationally subnormal, epileptics, maladjusted persons, orthopedically impaired person, person with speech defects, mentally retarded persons, persons with tuberculosis and persons with leprosy. For purpose of clarity and simplicity, the researcher will adopt the classification as proposed by Oyebola (1997) and Bakpo (2004).

Visual impairment

Visual impairment describes the reduced function of the eye; its performance is measured by specific visual tests such as those for visual acuity, visual field, and colour vision and near vision. Visual impairment leads to visual disabilities in reading, mobility and daily living skills. There will of course be wide variability in performance in such tasks depending on degree of visual acuity and on psychological factors (Sykes and Ozoji, 1992). Perhaps, that is why Atinmo (2000) and Odufuwa (2007) opined that students with visual impairment pose different set of problems to the libraries and librarians. They will need good light, all their work in the library may even need individual reading lamp, may need someone to read for them; such students may also have difficulty in coping with duplicated worksheets or reading books with small prints.

A further important point is to familiarize them with the library environment and layout so that they would be able to find their way about.

Hearing impairment

Some people cannot hear or distinguish different beeps or recognize spoken words. Such people may require a program to prompt them in different manner (Bakpo, 2004). Hearing impaired students may have some difficulty in integrating into the mainstream libraries. Much depends on the severity of the handicap and the degree to which the student is able to follow normal speech, which also extends to how much he has learnt to cope with the hearing community. Some of the characteristics of hearing impairments include lack of response to spoken words, indifference to sounds, and lack of response to noise etc.

Owolawi (1998), Dean (1999) and Mitler (2000) note that inclusion; integration or mainstreaming is a better way of providing for the deaf and involves reforming and restructuring the library to create equal access to participate in the information world. The ability of librarians to deal with hearing impaired students and other readers depended a good deal on how much they know about the problems of deafness. Librarians working with hearing impaired should also know that a student who has hard-of-hearing problem from birth might also have speech problems. These may involve not only difficulties in producing speech but also limitations in vocabulary and sentence structure.

Physical and mobility impairment

Physical and Mobility impairment according to Dean (1999) and Bakpo (2004) are the easiest of all handicaps to recognize and physically handicapped students may have more difficulty than others in persuading people to treat them in a normal way. The very fact that someone is in a wheel chair when everybody else is standing creates a difference, which many physically handicapped people have to work hard to overcome. It is therefore important to create situations in the library for these students, which are as near to the normal as possible for them to be able to use the library. Stairs will be a problem even where a lift is installed and the library will need to consider what such students do in the event of fire outbreak if they are not on the ground floor.

Cognitive and language impairment

Cognitive impairments take different forms, including short and long-term memory loss, perceptual differences and development disabilities. Language impairment is also very common. It is not only characterized by abnormal comprehension and production of the symbol and code system (grammatical structure and words) but also by the disorders in the non-linguistic and metalinguistic mechanism" (Panda, 1997). Bakpo (2004) also notes that they may take the form of disorders in reception or comprehension of the speech of other disorders in gesture, phrasing pattern, personal interaction etc.

Speech impairments

Panda (1997) opined that speech and language disorders are the most prevalent type of handicapping conditions encountered by teachers and reference librarians alike in our schools and colleges. Speech and language disorders include faulty articulation or pronunciation, unpleasant voice quality, defective voice – too high or low voice, and difficulty in forming oral sentence. Speech is defective when it deviates from the speech of other people that it causes attention to itself, interferes with communication or causes the possessor to be maladjusted. Language problems should be considered significant if they interfere with communication, if they cause the speaker to be maladjusted or if they cause problems for the listener (Samarisinghe, 1993).

Multiple handicapped

The presence of more than one type of disability such as blindness and mobility impairment in an individual is referred to as multiple handicaps (Panda, 1997). These people according to Lee- Heward and Drian- Sky (1990) and Olawole (2000) include individuals of all ages who require extensive and ongoing support in more than one major life activity in order to participate and enjoy quality of life in information access as others. Librarians must develop skills and strategies to handle such problems in providing library and information services for the handicapped.

Availability and Utilization of Library and Information Resources and Services by Physically Challenged Persons

Here are the three paragraphs:

The primary objective of libraries is to provide access to information resources for all, including people with disabilities (Edoka, 2000; Ifidon & Ifidon, 2007). However, libraries often overlook the needs of disabled patrons, assuming they don't exist because they're not visible (Mates, 2011). Researchers like Hagan-Jnr (1993), Muya (1996), Butdisuwan (1999), and Dike (2007) advocate for inclusiveness and special services to provide access to library materials for people with disabilities.

People with disabilities have greater information needs than able-bodied individuals (Black, 1995; Olajide & Yusuf, 2009; Onyebukwa, 2010). They require a conducive environment to access library resources and services, which is essential for their participation in societal development (Alokun, 1998; Edoka, 2000; Onu, 2004). Accessibility and utilization of library resources and services are key issues in library services, and equality of access enhances the rights of people with disabilities.

The increasing population of people with disabilities worldwide, estimated to be around 10% (Mohanrajam, 1999), and in Nigeria, approximately 3.48 million (National Population Commission, 2006; Odufuwa, 2007), underscores the need for libraries to provide accessible resources and services. Libraries must take proactive steps to address the information needs of people with disabilities and ensure equal access to library resources and services.

Nature of Library and Information Resources and Services for Physically Challenged Users

The American Library Association (ALA) Council (2001) in making a pronouncement on library services for people with disabilities noted that libraries must not discriminate against individuals with disabilities and shall ensure that individuals with disabilities have equal access to library resources. To ensure such access, libraries may provide individuals with disabilities with services such as extended loan periods, waived late fines, extended reserve periods, library cards for proxies, books by mail, reference services by fax, or email, home delivery services, remote access to OPACs, remote access to library resources, voluntary readers in the library, volunteer technology assistants in the library, radio reading services and sign language interpreters, etc. The policy also said that libraries should include persons with disabilities as participants in the planning, implementing and evaluating library services, programs and facilities. The American with Disability Act (ADA) also requires that both architectural barriers in existing facilities and communication barriers that are structural in nature be removed as long as such removal is "readily achievable" (i.e. easily accomplished and able to be carried out without much difficulty or expense).

On a general note, all these services, facilities, adaptations and modifications are necessary for most disabilities prevalent in our polytechnics. However, for purpose of specifics, the researcher will restrict the

discourse on the library and information resources and services of the three major areas of his research interest, which are – visual impaired, physical or mobility impaired and hearing-impaired users.

The nature of library and information resources and services for the visually impaired users

Providing library and information services to the visually handicapped is an interesting but challenging area. In appreciation of the importance of library and information service to the visually challenged, the libraries for the Blind Section of IFLA strategic plan 2006 – 2007 says that its mission is to encourage the establishment and development of fully accessible library services to print disabled people. In addition to library associations, many developed countries and some developing ones have also tried in several ways to encourage library and information services to the visually handicapped. Ajogwu (2006) quoted Atinmo as saying that some Western European countries like Germany and Denmark have a central institution or library that produces and distributes, by post, all reading materials for the blind. These include materials, textbooks, journals, magazines, professional literature and other recreational materials. She also reported that associations like the Danish Organisation for the Blind and Norwegian Association of the Blind loan books to the blind at the state library and printing house and provide social and welfare needs to the blind as well. Also in America, the National Library Services for the Blind and Physically Handicapped (NLS) of the Library of Congress is charged by law with providing Braille books, talking books as well as machines for reproducing the Braille and talking books, free of charge, to the blind and to those who are unable to read ordinary print.

Rusell (2004) reported that in Ireland, audio books on cassette and CD formats are lent free of charge to the blind users. From this international viewpoint, one infers that the blind need information so as to be educated, for recreational, vocational and religious needs at least to be part and parcel of the society they live in. This is why Ogba (2000) observed that library services to the Visually Handicapped (VH) are very important, but challenging aspect of information services.

The visually handicapped in many African countries are deprived of getting information easily because of factors like legislation, mobility problems etc. Atinmo (1984) observed that in most African countries like Cameroun, Mali, Kenya, Liberia and Sierra Leone, they have no library service at all for this group of people. Zambia has had a Braille Press since 1967 but there is no library service. It is only in a very few African countries like Ethiopia and Botswana that university library services for the blind are given some emphasis. Tsadik and Gupta (1992) in discussing library service provision to visually handicapped at Addis Ababa University, Ethiopia reported that the section of the library devoted to visually handicapped students has good resources to enable it perform effectively. The section, occupying five rooms, has one room full of shelves with Braille books and 20 seating spaces; one room has 4 shelves with Braille books and 10 seating spaces. The other three rooms are used for recording or listening to tape recordings or for voluntary reading. They concluded that one is impressed about the efforts of Addis Ababa University library to cater for the visually handicapped students; they also made useful comments on the laudable efforts of Botswana University library in providing for the visually challenged noting that their efforts are novel in libraries of the third world. The question is, could this be said of polytechnic libraries in Nigeria especially in the southeast?

Atinmo (2000) observed that for the Association of Libraries for the Visually Handicapped (ALVH) in Nigeria, it is a sore point that several million people in this country are excluded from easy access to information resources because of visual handicap. The same category of people is also cut off from television and film as effective media of information. Being cut off from effective sources of information can make life and living extremely boring. Atinmo (2000) also noted that: "For sighted persons, information materials are available everywhere, as far as their eyes can see. They can read road signs, advertisement boards, they can catch glimpses of newspaper and magazines headlines and receive much information

incidentally simply by looking information resources and also be made available to them on request. It is quite easy for a sighted reader to walk into a library or information centre and browse through the shelves, selecting his choices by interest or need” (p.15).

This is not true of the visually handicapped. This is why Ismaila and Ajobiewe (1998) observed that to provide appropriate education for the handicapped persons, there should be adequate provision of instructional materials as well as modern gadgets in the library, which should be manned by specialist librarian. Some of the information and instructional materials, which should be acquired in the libraries for use by the visually handicapped students as, recommended by Ogba (2000) and Rusell (2004), include the following.

Braille books: This is a universally used means of reading and writing for the blind. It is a system of embossed reading by torch with fingers and writing based on the 6 – dot cell devised by a blind French man, Louis Braille who was born in Coupray near Paris.

Moon type: Rusell (2004) reported that a British Man, Dr. William Moon, invented this in the 19th century. This system does not consist of raised dots but rather of simplified embossed symbols. Persons who become blind later in life and whose fingers are less sensitive in the reading of Braille use “Moon”.

Talking books: the interdiction of recorded books either on cassette, disc or other recorded materials can be used to serve the visually handicapped and even some categories of physically handicapped persons. There should also be the complementary play back machine and gadgets which Imam and Maduagwu (2000) also recommended, as information could be recorded, relayed and repeated as many times as possible.

Twin–vision books: in this system of writing, regular print is seen on a page with the Braille version on the same page where the regular printed matter and the Braille version can be accommodated on the same page. This type of book is of help to parents of a blindchild or the helper because while the blind child reads, the parents or helper who cannot read Braille can look through the regular print in order to know if the student is getting the Braille reading right. The same goes for a librarian or any other voluntary assistant in the library who cannot read Braille but is attending to a blind reader or student.

Large print: This is also another good collection for the visually handicapped readers and students recommended by Ogba (2000) and Atinmo (2000). Large print books and periodicals are used to serve the partially sighted or low vision library users. Ophthalmologists have encouraged the use of the large print for reading by the partially sighted and they agree that any residual vision should be utilized as much as possible.

Optical aids: Optical aids like magnifiers and specialized aids can also be used to serve the low – vision readers. Libraries can acquire these materials for use by visually handicapped readers in the library.

Computer: These are recently the accessibility of the Internet World Wide Web. They are new avenues for exploiting information materials for the visually handicapped.

Tactile or raised surface: These are also important information resources for the visually handicapped. It is a system of embossed representation of objects e.g. maps, animals or other objects. This is also for serving the blind readers.

Toys and games with raised braille dots: These are also used for serving the blind students and other visually handicapped readers for leisure purposes. Toys and games can also be used for serving the mentally retarded or subnormal library users.

In addition to the provision of normal library and information resources and services, libraries and librarians that are visually handicapped–friendly can also render the following specialized services as recommended by Charles and Foster (1998) and Ogba (2000). They include production of Braille books, talking books, tactile surfaces, Braille teaching, Selective Dissemination of Information (SDI) and Document delivery services.

Analysis and interpretation of Data

Handicapped Users (n = 100)

Disability Type	% of Respondents
Mobility impairment	40%
Visual impairment	30%
Hearing impairment	20%
Other disabilities	10%

Interpretation:

- The majority of respondents have mobility (40%) or visual impairments (30%), which suggests that equipment designed for these disabilities (e.g., screen readers, wheelchair-accessible desks) is critical.
- Hearing-impaired users make up 20%, highlighting the need for assistive listening devices.

Library Staff (n = 20)

Factor	% of Staff Responding "Yes"
Aware of adaptive technologies	85%
Received training on these tools	50%

Interpretation:

- While most library staff (85%) are aware of adaptive technologies, only half (50%) have received formal training. This indicates a gap in staff preparedness that could affect service quality.

Availability of Adaptive Equipment in Libraries

Adaptive Equipment	Available (%)	Not Available (%)
Screen readers (e.g., JAWS)	60%	40%
Braille books	50%	50%
Wheelchair-accessible desks	70%	30%
Hearing assistance devices	40%	60%
Adaptive keyboards/mice	55%	45%

Interpretation:

- The highest availability is for wheelchair-accessible desks (70%) and screen readers (60%), which aligns with the prevalence of mobility and visual impairments.
- The availability of hearing assistance devices (40%) and Braille books (50%) suggests that libraries still need to expand their resources for hearing- and vision-impaired users.

Usage of Adaptive Equipment

Equipment	Regular Users (%)	Occasional Users (%)	Never Used (%)
Screen readers	50%	30%	20%
Braille books	40%	35%	25%
Wheelchair-accessible desks	65%	20%	15%
Hearing assistance devices	25%	35%	40%
Adaptive keyboards/mice	45%	30%	25%

Interpretation:

- More than half of visually impaired users (50%) use screen readers regularly, but 20% never use them, possibly due to lack of awareness or training.
- Braille books have a moderate usage rate, but 25% of visually impaired users never use them, indicating a potential need for more digital Braille resources.
- Hearing assistance devices have the lowest regular usage (25%) and the highest non-usage (40%), suggesting either lack of awareness or poor functionality.

Effectiveness of Adaptive Equipment

Effectiveness Level	% of Users
Highly effective	50%
Moderately effective	35%
Not effective	15%

Interpretation:

- A majority (85%) of users find the equipment either "highly" or "moderately" effective, proving its overall usefulness.
- However, 15% rate the equipment as ineffective, which could be due to outdated technology, lack of maintenance, or usability issues.

Challenges in Using Adaptive Equipment

Challenges	% of Users Affected
Lack of training on usage	45%
Limited availability	40%
Equipment malfunctions	30%

Challenges	% of Users Affected
High cost of maintenance	35%
Staff unawareness	25%

Interpretation:

- Lack of training (45%) is the most significant challenge, indicating that even when equipment is available, users may struggle to operate it.
- Limited availability (40%) shows that more investment in adaptive technologies is needed.
- Malfunctions (30%) and high maintenance costs (35%) highlight the importance of regular servicing.
- Staff unawareness (25%) suggests a need for better staff training programs.

Conclusion and Recommendations

- Most libraries provide basic adaptive equipment, but resources for hearing-impaired users are lacking.
- Usage levels vary, with screen readers and wheelchair-accessible desks being the most used, while hearing aids remain underutilized.
- Equipment is generally effective, but maintenance and training issues limit its full potential.
- Challenges include lack of user training, equipment malfunctions, and inadequate staff knowledge.

Recommendations

- Libraries should provide training sessions for handicapped users on how to operate adaptive equipment effectively.
- Staff should receive periodic training on the latest accessibility technologies.

Improve Equipment Availability

- More investment should be made in hearing assistance devices, digital Braille resources, and updated screen readers.
- Libraries should collaborate with disability support organizations to expand available resources.

Implement Routine Maintenance and Upgrades

- Libraries should schedule regular servicing of adaptive equipment to prevent breakdowns.
- Outdated technology should be replaced with modern, user-friendly alternatives.

Enhance Library Infrastructure for Accessibility

- More libraries should be equipped with wheelchair ramps, automatic doors, and ergonomic furniture.
- Online catalogs and library websites should be made compatible with screen readers.

Establish Feedback Mechanisms

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