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# Exploring the Provision of Information Services for Visually Impaired Students: Lessons Learned from the University of Dar es Salaam, Tanzania

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## Abstract

This study employed a descriptive research method to investigate the provision of information services for visually impaired students (VIS) at the University of Dar es Salaam. The research conducted a comprehensive examination by employing a census sampling technique, targeting a population of 25 VIS. Qualitative methodologies were utilized to collect data, with thematic analysis serving as the means to categorize and describe the gathered information. The study's findings revealed that VIS have specific information needs, notably necessitating orientation programs for university management and the acquisition of effective computer application skills to manage their studies proficiently. Additionally, the study identified commonly used equipment among VIS, including Perkins braille devices, braille embossers, typewriters, long white canes, and audio recorders. Furthermore, the research exposed limitations in inclusive education, which fails to adequately accommodate the information-seeking requirements of VIS. Limited access to modern facilities and challenges related to mobility stemming from less supportive infrastructure were identified as significant barriers affecting the information-seeking process. Generally, the study emphasized that VIS primarily center their information needs around academic requirements. This highlights the imperative of modern facilities and supportive infrastructure to ensure effective information provision for VIS. These insights emphasize the critical importance of addressing the specific information requirements and challenges faced by visually impaired students within the higher education context.

**Keywords:** *Visually impaired students, Information services, University of Dar es Salaam, Assistive technology, Inclusive education*

## Introduction

Visually impaired students encounter numerous obstacles when it comes to accessing educational and information services. Inadequate support in this regard can severely hinder their ability to actively engage in academic and research pursuits, leading to subpar academic performance. The University of Dar es Salaam in Tanzania, a prominent academic institution in East Africa, houses a substantial population of visually impaired students. This research article seeks to delve into the provision of information services for these students at the University of Dar es Salaam, pinpointing valuable insights and exemplary practices that can be embraced by other educational institutions. Recent years have witnessed a surge in research focused on enhancing accessibility and inclusivity in education, with a particular emphasis on catering to the needs of visually impaired students.

Numerous studies have shed light on the hurdles visually impaired students encounter when trying to access information services. These challenges encompass a scarcity of accessible materials, a lack of comprehensive training for librarians and other personnel regarding accessibility issues, and inadequate financial resources for acquiring assistive technologies. Nonetheless, there exists a noticeable dearth of practical solutions, particularly in the context of higher education institutions situated in developing nations. This research endeavors to bridge this knowledge gap by scrutinizing the delivery of information services tailored to visually impaired students at the University of Dar es Salaam. The objective is to uncover efficacious strategies and glean valuable lessons from this context.

Access to information serves as a fundamental cornerstone in enhancing the well-being of individuals, irrespective of their race, gender, religion, or abilities. On a broader scale, information plays a pivotal role in the progress and advancement of nations, serving as an indispensable resource for effective business administration. It functions as a conduit for staying informed about real-time events, offering a glimpse into the performance of businesses, and guiding decisions by discerning the positivity or negativity of outcomes. Nevertheless, there exist numerous barriers that can hinder the appreciation of the advantages of information and how human behavior can influence its effectiveness for those who seek to utilize it.

As per the insights of Castells and Cardoso (2006), information holds a dual role in our world: it not only serves as the bedrock for knowledge development but also stands as the wellspring of innovations and revolutions. It is the lifeblood of an informed citizenry and an indispensable factor in the progress of society as a whole. Nonetheless, despite its paramount importance, challenges persist in terms of effectively accessing and utilizing information. These challenges demand our attention and

concerted efforts to ensure that the potential of information is accessible to all.

In alignment with this perspective, Scotland and the Scottish Government (2013) recognize the profound significance of information as an invaluable resource for every individual. They underscore the imperative of providing equitable access to information, regardless of one's background or circumstances. This recognition underscores the commitment to fostering a society where the benefits of information are universally available and can be harnessed by all.

Visually impaired students often encounter significant difficulties when it comes to accessing academic-related information promptly. This challenge can impede their capacity to make well-informed decisions in a timely manner, potentially exacerbating issues rather than resolving them. In a world where an overwhelming volume of information is readily available, as highlighted in Mubofu's (2019) study titled "Awareness, Types, and Contribution of IL Programs to Students at the College of Business Education in Dar es Salaam, Tanzania," individuals, including visually impaired students, must cultivate a deeper understanding of information sources. Furthermore, they need to develop the skills necessary to acquire, assess, utilize, share, and disseminate information for academic, research, and consultancy purposes.

For visually impaired students, it is not sufficient for information to merely exist; they must be empowered to access information through information-seeking behaviors of their choosing. Moreover, the information they retrieve must meet their general or specific needs. In essence, fostering an environment where visually impaired students can navigate information effectively is essential to their academic success and overall educational experience.

Similar to their sighted peers, visually impaired students require access to information to facilitate their studies and daily activities, as noted by Moore (2002). Nonetheless, it's essential to recognize that several critical factors, such as the timing, quantity, accuracy, and availability of information, play a pivotal role in meeting the unique needs of visually impaired individuals, as highlighted by Seyama (2010). This research initiative aims to delve into the specific information requirements of visually impaired students, the specialized equipment they need to access this information, and the obstacles they encounter when seeking and utilizing information resources for academic purposes. The focal point of this investigation will be the University of Dar es Salaam, shedding light on the particular challenges faced by visually impaired students within this educational context.

## **Methodology**

**Study Area:** The research was carried out within Ubungo District, located in Dar es Salaam, at the University of Dar es Salaam (UDSM). UDSM stands as the oldest and largest public university in Tanzania, setting the stage for this investigation.

**Research Approach and Design:** The research employed a qualitative research approach paired with a descriptive research design. The selection of a descriptive research design was purposeful, as it allowed the researchers to gather factual information concerning the information needs of visually impaired students (VIS). This design was particularly effective and accurate in the context of this study because it is tailored to examining existing situations, practices, attitudes, emotions perceived as contributors to specific issues, ongoing processes, and emerging trends. In essence, it provided a comprehensive framework for understanding and assessing the complexities surrounding the information needs of visually impaired students.

**Target Population and Sample Size:** The study focused on a target population of 25 students with visual impairments enrolled at the University of Dar es Salaam. Utilizing a census sampling technique, the researchers opted to include the entire target population in the study. This approach was chosen to ensure a comprehensive understanding of the information needs and challenges faced by these visually impaired students.

**Sampling Procedure:** The researchers employed a census sampling technique, which involved including all 25 students with visual impairments from the University of Dar es Salaam. This method was chosen to ensure that the study could capture detailed information about the information requirements and difficulties encountered by this specific group of students. The list of visually impaired students was obtained from the Special Education Unit at the School of Education (SOED) within the University of Dar es Salaam, aiding in the identification of the participants.

**Data Analysis:** The process of data analysis encompassed the systematic exploration, categorization, and description of the collected data. A deductive approach was adopted for this purpose. The data derived from the field were meticulously organized, described, and analyzed through qualitative methods, with a particular focus on thematic analysis. This approach enabled the researchers to discern patterns, themes, and key insights from the data gathered during the study.

## **Results and Discussion**

**Information Needs of Visually Impaired Students:** The principal aim of this research was to pinpoint the precise information requirements of visually impaired students enrolled at the University of Dar es Salaam (UDSM). This goal was achieved by posing two fundamental questions to all participants:

- i. "What information do you need to facilitate your learning activities?"
- ii. "What equipment do you require to enable you to access information and engage in effective learning?"

These questions served as the cornerstone for uncovering the unique information needs and technological necessities of visually impaired students within the UDSM academic environment. The research involved interviews with visually impaired students, and the outcomes revealed a notable consensus among the majority of participants regarding their shared information needs essential for effectively navigating their studies. Specifically, they highlighted several critical areas of information requirement:

- i. **Modern Information-Seeking Strategies:** Participants expressed a strong need for information regarding contemporary techniques and strategies for seeking and accessing information effectively. This included utilizing digital resources and assistive technologies tailored to their needs.
- ii. **Orientation and Mobility Information:** Another prominent need identified was information on how to move independently and seamlessly throughout the UDSM campus. This highlights the significance of orientation and mobility training to facilitate their physical navigation within the educational environment.
- iii. **Academic Management:** Visually impaired students emphasized the need for information that would enable them to efficiently manage their academic studies. This might encompass guidance on study techniques, time management, accessing course materials, and academic support services.

The study's findings underscore the vital importance of providing visually impaired students with not only accessible information but also information that directly addresses the unique challenges they encounter. Identifying and addressing these specific information needs, universities and other educational institutions can offer more targeted support to visually impaired students, ultimately enhancing their overall learning experience and ensuring equal access to educational resources.

### **Information Requirements for Visually Impaired (VIS) Students to Support Academic Learning:**

In the context of this study, participants were asked to provide examples of situations in which they required information to solve problems or make decisions. The study findings revealed that the most prevalent information needs of visually impaired students were predominantly associated with academic matters. Specifically, the most pressing needs were centered around the following aspects:

- i. **Access to Assignment Information:** When tasked with assignments, visually impaired students required access to the assignment details and guidelines. To obtain this information, they relied on volunteers from the special education department to read the assignment instructions to them.
- ii. **Searching for Relevant Information:** After acquiring the assignment details, visually impaired students needed to search for appropriate sources of information to complete their assignments effectively. This process involved visiting the library and initiating searches for relevant academic materials.
- iii. **Dependence on Others:** Visually impaired students expressed a heavy reliance on others, such as volunteers or sighted students, to read and seek information for their assignments. This dependency on external assistance often resulted in delays, backlogs of assignments, and missed submission deadlines.

A student's quote encapsulated the challenge they faced, stating, "When lecturers give us an assignment, I either go to the special education department or to other sighted students to seek assistance for a needed piece of information."

These findings underscore the critical need for visually impaired students to access information independently and efficiently to meet their academic requirements. Addressing this need can significantly improve their educational experience and ensure equitable access to academic resources.

The findings from this study align with the research conducted by Seyama et al. in 2014, which also emphasized the specialized information needs of visually impaired students and the importance of repackaging information to make it accessible to them. In both studies, it becomes evident that information needs are pivotal in the lives of all students, including those with visual impairments.

In this study, the majority of visually impaired students identified specific information needs focused on enhancing their information-seeking skills and their ability to navigate independently within the expansive University of Dar es Salaam (UDSM) campus, all in pursuit of effectively managing their studies. One student underscored the importance of an orientation program tailored to their needs, expressing the need for skills to navigate the complex university environment, stating: "...as you know, the environment around the University of Dar es Salaam is very large and complex..... therefore, we need a special orientation program to give us skills on how to manage the university environment and through which we can manage our studies."

Furthermore, another visually impaired student highlighted their information requirements, particularly emphasizing the necessity of

effective computer application skills to facilitate their studies. They noted the availability of specialized computer programs designed for visually challenged individuals, such as e-learning platforms for visually impaired students and web-braille, as valuable resources to access the information they require to support their learning.

These insights emphasize the importance of tailored information resources and support systems to meet the unique needs of visually impaired students, ultimately enhancing their educational experiences and enabling them to access the information necessary for academic success.

The researcher identified several innovative features within the infrastructure of the new University of Dar es Salaam (UDSM) library that have been specifically tailored to support the information needs of visually impaired students. These features include:

- i. **Sophisticated Devices:** The library is equipped with advanced assistive devices that have been designed to facilitate the retrieval of information for visually impaired individuals. These technologies are instrumental in making information more accessible and user-friendly.
- ii. **Architectural Design:** The library's architectural design has been thoughtfully crafted to enhance accessibility for visually impaired students. This design prioritizes ease of navigation and ensures that information spanning various domains, such as career-related, current affairs, college-related activities, politics/government, and science-related content, is readily accessible to them.
- iii. **Supportive Layout:** The layout of the library is designed with the specific needs of visually impaired students in mind. This includes features such as a talking lift and Braille marks that assist visually impaired students in navigating the library seamlessly. These elements make it easier for them to move around the library and locate the information they require.

As a result of these thoughtful enhancements and the incorporation of assistive technologies, the researcher observed that visually impaired students are effectively utilizing these resources to access their information needs across various sections of the library. This reflects the positive impact of accessible infrastructure and technology in ensuring that visually impaired students can readily access the information necessary to support their academic pursuits and overall learning experience.

### **Equipment Needed by VIS**

It's critical to comprehend the tools VIS frequently use in order to assist their information wants. According to UDSM research, VIS frequently utilized tools such Perkins braille readers, braille embossers, typewriters, long white canes, and audio recorders. They also utilize smartphones and desktop computers in addition to these. A4 paper frames are also used by



the students, who also acknowledged receiving free braille embossers and braille paper.

It is important to provide training and awareness on how to use these equipment effectively to support the learning and information needs of VIS. This can help them navigate through the barriers and challenges they face in accessing information and education. Additionally, providing access to assistive technologies such as screen readers, magnifiers, and speech recognition software can further enhance their learning experience.

It's great to see that the UDSM has provided a range of equipment to support the teaching and learning needs of visually impaired students. The EZ Thermoform machine is a great tool for Braille duplication, and the Braille Duplicator machine can be used for making teaching aids and Braille copies from a single master. The computer is also an essential tool for visually impaired students, and the Perkins Braille Machine is a critical machine that has a great impact on students with visual disabilities. This machine can extract conversational reading into tactile Braille cells, allowing visually impaired students to read and learn just like their sighted peers.

It seems like the use of abacus and radio cassette is not commonly practiced by visually impaired students at UDSM, according to the interviewee. They mentioned that they were not taught about abacus and also did not use the radio cassette because they had access to an audio recorder. This suggests that advancements in technology have made certain devices less necessary for the visually impaired community and that new devices have replaced them.

Although a variety of equipment is available to support the learning demands of VIS, some of the equipment seems to be underutilized by most students. This could be attributed to various reasons, such as a lack of ability and skills in using that equipment or unavailability of equipment. Therefore, it is essential that VIS also receive information on how to effectively use those machines.

Furthermore, additional research findings reveal that many visually impaired students at UDSM express a strong desire for information on how to effectively use personal computers and portable handheld devices to support their learning needs. One interviewed student stated: "*Education nowadays heavily relies on ICT... We would like to use personal computers and smartphones with special software and programs designed for visually impaired students... However, the problem lies in my low skills in computer application and the unavailability of specialized computer application software for visually impaired students at the university.*"

During the researchers visit to the new library building, I observed several facilities and equipment designed to support the learning needs of visually impaired students (VIS). Firstly, the library has a computer cluster

with around 150 computers connected to the internet. Out of these, 16 computers were equipped with Adobe reading software that can assist VIS in accessing the required information in the library. The VIS readers act as intermediaries that help the students navigate the computer room and operate the systems by searching for subscribed materials, enabling them to listen to the materials through headphones and take notes to support their learning.

Secondly, the new library features an Audition (multimedia) room that contains machines capable of assisting VIS in retrieving the required information using their flash discs, DVDs or CDs containing the necessary information. Additionally, lecturers can use tutorials in a multimedia format to support VIS in accessing the required information.

Based on the results obtained in the first objective, the study has shown that the information and equipment need of visually impaired students at UDSM vary depending on the level of visual impairment and individual demands. However, there are some similarities in their needs and demands, such as information on coping with information-seeking strategies and independent mobility around the UDSM campus, which are fundamental to most visually impaired students' academic life. These findings are consistent with Appiah's (2017) study, which also found that the information needs of visually impaired students vary among universities, although the specific types of information needed differ from those found in this study.

### **Challenges Faced by Visually Impaired Students**

The second objective of the study aimed to identify the challenges faced by visually impaired students when seeking information. The research question underlying this objective was "What challenges do visually impaired students face when seeking information?" The interviews conducted with visually impaired students revealed that they face varied challenges depending on the levels of their sight. Some have total impairments while others have partial impairments, thus having different learning needs among them.

From the interview with one visually impaired student, it was revealed that inclusive education does not suit the information-seeking needs of visually impaired students, hence bringing about a great challenge to them. The student expressed disappointment with the fact that during lecture hours, visually impaired students are combined with normal students whose learning needs differ from theirs. They suggested that lecturers should understand that they deal with students who have varied learning needs and put possible extra consideration into them.

It is true that lectures presented in class are often in the form of PowerPoint presentations including information predominantly as images, charts, and graphs that visually impaired students can't see clearly or

completely due to the problems they have. Therefore, visually impaired students' preferences must be given consideration, and information should be provided in a format that is friendly to their ability so that they can easily access and utilize them.

Another visually impaired student added that: *"We normally attend lecture sessions together with other students. For my suggestion, it will be better if we will attend our own specialized lecture sessions, and lecturers have to prepare Braille handouts and give them to us before the start of the lecture session."*

The above findings clearly demonstrate that the inclusive education system does not cater well to physically challenged students who have special learning needs, particularly visually impaired students because their information-seeking behavior differs. Another interviewed visually impaired student explained that: *"In a current technologically advanced world, computers play a big role in facilitating information access and transfer. Although there are a few computers in the special needs department, computers are outdated with no relevant applications software and in-depth training that can assist visually impaired students in accessing needed information for learning."*

During interviews with visually impaired students, it was found that a lack of effective technology for assessing their academic achievement is a major challenge in their academic life. The students explained that they use typewriters during university exams, but this is ineffective for them as they cannot go back and verify what they typed. One student reported not receiving appropriate support most of the time and having to figure out what to do next on their own. This is unfair, as they become worn out by the time, they start the actual assignment and reach the submission deadline. These findings make it obvious that typewriters are not suitable equipment for visually impaired students to manage their studies due to limitations such as difficulties in editing and deleting mistakes. The resources provided to visually impaired students do not offer maximum support for their learning. Therefore, much effort is needed in the Special Needs Department to provide relevant assistive technology and training on how to use computers. Providing laptops installed with JAW software would help visually impaired students access information easily.

The data collected from the observations also confirms that most of the facilities available for visually impaired students (VIS) are outdated and have a slow rate of replacement with modern facilities that are necessary for VIS learning. Additionally, the interviews conducted indicate that there are mobility challenges due to less supportive infrastructures. The observations provide clear evidence that most of the infrastructures around UDSM are not supportive and friendly enough to support easy mobility of VIS from one place to another, hence affecting their information-seeking behavior. However, there have been some improvements in supportive infrastructures for enabling visually impaired students to manage their

studies at UDSM. The newly constructed buildings tend to consider the mobility requirements of VIS and other students with disabilities. For instance, the SOED building has provided special pavements for people with disabilities as far as studying is concerned. Visually impaired students at the SOED building can easily navigate through and reach the school resource center to access their information sources. Therefore, some measures are being taken to solve some challenges.

## **Conclusion and Recommendations**

### **Conclusion**

Based on the data gathered from observations and interviews, it can be concluded that the primary information needs of visually impaired students at UDSM revolve around their academic pursuits. These students require information on how to effectively utilize modern technology for learning, as well as information on how to improve their independence in order to support their academic studies at the university. Therefore, it is crucial for the university to provide adequate and relevant information resources that meet the unique needs of visually impaired students.

Based on the study, it was found that visually impaired students at UDSM face challenges in their information-seeking process due to the lack of modern facilities and supportive infrastructures on campus. These challenges result in delays in meeting their information needs, despite their information-seeking behavior being similar to that of other students. While UDSM has made some efforts to improve the teaching and learning environment for visually impaired students, further initiatives are needed, such as information packaging for visually impaired students. Therefore, it is important for UDSM to continue to address these challenges and provide the necessary support for visually impaired students to ensure they have equal access to information and educational opportunities.

### **Recommendations**

Based on the study, the researcher recommends the following actions to address the challenges faced by visually impaired students at UDSM:

- The university should provide the necessary assets such as information resources, space, services, and ICT infrastructure to meet the information needs of visually impaired students.
- VIS hostels should be located very close to the library building and lecture rooms to facilitate easy and convenient access to the required information.
- The special unit should have enough computer systems with advanced technology for visually impaired students to improve their learning, such as Zoom text magnifier/reader, JAWS, and Braille Note Touch.
- To enhance the learning of visually impaired students, there should be adequate resources such as materials, equipment, and facilities. The

unit must engage fully in information repackaging to facilitate access to information and use of information resources by visually impaired students. Implementing these recommendations will help to create a more inclusive and supportive learning environment for visually impaired students at UDSM, and ensure that they have equal access to information and educational opportunities.

### **Study implications**

This study implies that the University of Dar es Salaam needs to prioritize the provision of information resources that specifically cater to the academic information needs of visually impaired students. The university should ensure that visually impaired students have access to information on modern technologies that can enhance their learning experience, as well as resources that can help them improve their independence. Providing these resources will not only support the academic success of visually impaired students but also promote inclusivity and diversity within the university community.

The implication of these findings is that UDSM needs to take more action to ensure that visually impaired students are able to access information and educational opportunities on an equal basis with other students. This can be achieved through the provision of modern facilities and supportive infrastructures that cater to the unique needs of visually impaired students. Additionally, UDSM should focus on developing information resources that are specifically designed for visually impaired students, in order to ensure that they are able to access information in a timely and effective manner.

### **Areas for further research**

Some possible areas for further study related to visually impaired students' information needs and access to information could include:

- The impact of technology on visually impaired students' learning outcomes - this could involve studying the effectiveness of different types of technology for visually impaired students and how their use impacts their academic success.
- Accessibility of digital resources for visually impaired students - this could involve assessing the extent to which digital resources, such as e-books and online databases, are accessible to visually impaired students and identifying barriers that need to be addressed.
- The role of libraries and librarians in supporting visually impaired students' information needs - this could involve examining how libraries can improve their services and resources to meet the unique needs of visually impaired students.

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