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The Impact of Inclusive Access Facility Design on Space Utilisation for Persons with Disabilities in Makerere University Residential Halls

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Abstract

This study explored the experiences and perceptions of persons with disabilities (PWDs) regarding the inclusive design of access facilities and the utilisation of spaces in Makerere University halls of residence. Specifically, it focused on PWDs with mobility challenges and/or visual impairments, exploring how they manoeuvre through and around the residential halls. Thus, it addresses a gap in understanding the key drivers of comfort (or discomfort) for PWD users when utilising university accommodation spaces, and how they adapt to non-inclusive spaces. The research employed a descriptive research design, primarily using qualitative methods. Fifty-four PWD resident students, identified through snowball sampling, were the key units of analysis. In addition, other key informant respondents were purposively selected from Makerere University administrative and support staff. They included nineteen university administrators and twenty-nine support staff. Data on the positioning, condition, user experiences with manoeuvrability, and policy compliance were collected. The collection was done using questionnaires, structured interviews and Focused Group Discussions (FGDs). Two FGDs were conducted with PWD respondents, and additional information was collected through observation and photography. Data analysis was conducted using thematic categorisation. The results of this study indicated that the experiences and perceptions of PWD users regarding the utilisation of access facilities in university halls unfolded into four thematic areas: the unique challenges for each PWD gender, mobility within accommodation facilities, selective facility positioning, ground-floor accessibility limitations, and manoeuvrability in common areas. Overall, this study concluded that the design and condition of access facilities significantly influence the extent to which PWD users utilise accommodation spaces. While there have been some efforts to incorporate access facilities, the persistent design flaws and maintenance gaps have evidently hindered effective space utilisation and compromised their safety.

Keywords: *PwD mobility; facilities performance; Universities; Uganda*

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1. Introduction

The inclusiveness of accessibility in university accommodation facilities, especially for persons with disabilities (PWDs), has been increasingly concerning over the last decade. According to a 2012 United Nations report, approximately 10% of the world's population are PWDs, with 7% residing in developing countries. Such figures make this portion of the population significant enough to understand how they fall into the inclusivity debate (Hashim et al., 2012). Otherwise, without a specific, tailored focus, inclusivity may not be achieved.

In Africa, records indicate that an estimated 60-80 million individuals live with disabilities (Vanderschuren and Nnene, 2021; Worldometer, 2025). The African percentages may appear lower than global statistics, which range from 3.85% to 5.13% (Worldometer, 2025), but many cases in Africa are missed due to inadequate records (Zziwa et al., 2019). The 2011 World Report on Disability by the World Health Organisation indicates that Africa has a higher prevalence of moderate and severe disabilities compared to many other regions, particularly among people under 60 years old (Jolley et al., 2018). In Uganda, PWDs constitute a significant portion of the population and face various challenges in accessing opportunities, especially in the built environment (Ghore, 2016). According to the Uganda Bureau of Statistics (UBOS) 2016 Census Report, approximately 12.4% of Ugandans live with some form of disability, amounting to around 4.5 million individuals (Kaggya, 2019). Such figures underscore the importance of designing buildings and infrastructure in Uganda to accommodate the needs of PWDs.

Meeting the needs and expectations of PWDs is integral to achieving the Sustainable Development Goals (SDGs), which aim for universal inclusivity and leave no one behind (Panda & Kaur, 2024), with special emphasis on SDG 10, which focuses on reducing inequalities. The SDGs and the "Leave No One Behind" agenda prioritise the inclusion of marginalised groups, particularly people with disabilities, in mainstream development (Jolley et al., 2018). Also, Goal 4 focuses on inclusive, quality education and lifelong learning, aiming to develop educational facilities that accommodate the needs of children, PWDs, and people with diverse gender identities, ensuring safe, inclusive, and effective learning environments for all (Kavishe & Isibika, 2018). The United Nations Convention on the Rights of Persons with Disabilities also emphasises the importance of making adaptations to enable PWDs to participate in society fully (Jolley et al., 2018).

On-campus student accommodation is crucial in meeting the students' needs and creating a supportive living and learning environment. Universities are therefore charged with addressing concerns such as the performance of access facilities and building quality to ensure satisfaction and inclusivity, especially for PWD students (Oke et al., 2017). Therefore, the design of access facilities in student residences is crucial for social inclusion and usability for PWDs, as social structures and attitudes can create or worsen disabilities, affecting their ability to access residential halls (Mubiru, 2022).

The inclusive design of access facilities for PWDs is specific. It incorporates features such as ramps, lifts, and accessible bathrooms equipped with grab bars, which optimise space utilisation and enable seamless navigation (Amole, 2009). Others may be designated parking spaces near entrances and furniture layouts that promote spaciousness in communal areas. They also include clear signage, wide corridors, automatic doors, tactile indicators for navigation,

and accessible amenities such as accessible public quadrangles for resting, along with conveniently located, comfortable seating areas (Soyingbe et al., 2007). Effective designs are expected to enhance accessibility and autonomous manoeuvrability within the residence halls. If this is achieved, it may incorporate an ecological architecture approach, which is likely to improve the user experience (Hutabarat and Siahaan, 2022). In this way, inclusive accessibility features that simplify access to common areas are essential to how comfortably PWDs use and interact with the campus residential space.

Studies of students' manoeuvrability on non-inclusive access facilities at university campuses in Africa have been a focus of several scholars in recent years. For instance, recent research has focused mainly on the experiences of PWD in academic and public spaces. Identifying barriers within these environments and emphasising the need for accessible design adhering to regulatory standards (Ilako et al., 2020; Kavishe and Isibika, 2018; Mubiru, 2022). However, a gap remains in understanding how such non-inclusive design principles influence space utilisation within residential settings of public campuses for PWDs, as well as how they adapt to these spaces without inclusive features. By filling this gap, this study aimed to provide insights to inform improvements to residential design standards and to create more inclusive living environments for PWDs in residential halls. This study thus examines the effects of the non-inclusive access facility on PWDs' utilisation of space in Makerere University residence halls. Specifically, it will focus on PWDs with mobility challenges and/or visual impairments, exploring how they manoeuvre through and around the non-inclusive halls. The PWD space expectations, especially when using institutional accommodation facilities, are unique, specific and sensitive to inclusivity standards. Once such expectations aren't met, PWD users risk failing to maximise the utilisation of accommodation spaces and the core purpose of their being in the university. The inclusivity space requirements and expectations are elaborated in this section.

1.1. Inclusivity

The terms "inclusive", "inclusion", and/or "inclusivity", used interchangeably, have a wide range of meanings, especially in educational and social settings. Some schools of thought contextualise it in terms of active engagement and the integration of diverse individuals, guaranteeing equal access and participation irrespective of their distinct characteristics (Hyde et al., 2017; Sturm et al., 2011). Others associate inclusivity with a teaching approach that ensures all students, regardless of disability, ethnicity, socioeconomic status, or cultural background, have equal access to education and opportunities for active participation (Clark and Gorski, 2001; Thomson, 2018). Inclusivity emphasises recognising and embracing diversity to create meaningful learning experiences for every student (de Borba et al., 2024). Inclusion aims to bridge the gap between students with and without special educational needs. One way to achieve this is to foster interaction and social skills among students with special needs (Arupam, 2025). However, despite its positive intentions, implementing inclusive education, especially in public universities in sub-Saharan Africa, faces several practical bottlenecks today.

Inclusive design of access facilities must be tailored to meet the end users' specific needs. Such conformance is particularly relevant in university residential halls, where the extent to which access facilities accommodate PWD users' preferences directly affects users' ability to utilise space efficiently. Inclusivity in residential facilities extends beyond mere compliance with accessibility standards; it must be assessed by how well the infrastructure aligns with the movement patterns and daily activities of PWDs. Therefore, while it is widely accepted that

the model of a residential hall should be inclusive (LeBlanc, 2023; Yessenbayev et al., 2024), the concept remains somewhat ambiguous, leading to uncertainty about how to capture its essence.

Hamilton et al. (2022) argue that ensuring an inclusive property management model should encompass more than just its functional utility. It should also consider how it is managed, as well as the specific challenges and contexts related to the project. Such contexts must include user demographics, environmental factors, regulatory requirements, and social dynamics. In such a way, the concept of inclusivity will likely focus on creating practical, reliable, and feasible models. This framework can be applied by property and facility management teams when designing access facilities in halls of residence to ensure they meet the needs of PWDs. For instance, Khozaei et al. (2011) indicated how inclusive accommodation would boost students' identity, well-being, and satisfaction. In this way, for PWD students, satisfaction could be linked to the availability of accessible infrastructure. This would include installing ramps, elevators, and expanded entryways, which significantly affect their mobility and overall experience in residential facilities.

An effective approach to student accommodation should provide adequate shelter and inclusive, safe, and accessible environments that promote academic success and well-being. Universal Design principles, including wheelchair-accessible ramps, elevators, and adjustable furniture, make housing accessible to PWD students, improving their ability to use available spaces efficiently (Taylor, 2019). However, such fit-for-purpose facilities and equipment may not be successfully installed without user feedback.

There are several ways to seek feedback. For instance, an approach suggested by Gomide et al. (2024) emphasises going beyond minimum legal standards to achieve genuine inclusivity. Rather than adding only accessibility features like back ramps, campuses may strive to create equal student experiences by integrating features such as adjustable furniture and gently sloped walkways, thereby promoting safety, choice, and accessibility. Ensuring that inclusive design elements reduce accident incidences, enhance PWD preferences, and optimise space utilisation.

1.2. Space utilisation

Adequate space and manoeuvrability are fundamental in the design of access facilities. The efficiency of space utilisation among PWDs in residence halls depends on how well access facilities accommodate their mobility and the execution of various activities. Accessibility elements, such as well-placed handrails, adjustable furniture, and step-free access routes, contribute to optimal use of space (Gomide et al., 2024). Concurrently, poorly designed spaces, such as narrow hallways or bathrooms with inaccessible fixtures, reduce PWDs' ability to navigate and utilise their living environment effectively. Moreover, accessibility, coupled with the guarantee of the security and privacy of PWD students, ensures satisfaction with the buildings' performance.

Additionally, the PWD's perceived safety is enhanced by secure entrances, surveillance systems, and improved lighting, enabling students to focus on academics and social life without constant concerns about their well-being. Furthermore, an inclusive and efficient space should allow PWD students to navigate their living spaces safely without obstacles. Such design features will likely improve the students' overall quality of life, allowing them to fully engage in university life (Khozaei et al., 2011).

Reducing the incidence of accidents among users is one strategy for maximising the performance of residential halls. Such accidents among PWDs in halls of residence often result from poorly designed access facilities, including slippery surfaces, a lack of tactile indicators, steep staircases without railings, and improperly maintained elevators. Thus, Taylor (2019) it is asserted that inclusive designs incorporating anti-slip flooring, warning signals for visually impaired students, and adequately spaced corridors significantly help reduce such incidents. Furthermore, adaptive, accessible common areas encourage social interaction and engagement in university life, fostering relationships and a sense of belonging. Such focus on inclusivity transforms accommodations into supportive environments where every student feels connected (Khozaei et al., 2011). However, inadequate access facility designs, such as poorly positioned grab bars or malfunctioning lifts, hinder mobility and increase the risk of falls and injuries. This highlights the critical role of inclusive design in minimising accidents among PWD students.

In line with the standards, several scholars have opined on the minimum dimensions for access facilities for PWDs. Such facilities are expected to include wide doorways with a minimum unobstructed opening of 900 millimetres and clear pathways between 900 and 1200 millimetres wide for easy movement around furniture and counters (Maczka, 2013; Okafor and Nwosu, 2024). Additionally, ramps are expected to be at least 1200 millimetres long, with resting areas every 6 meters to facilitate smooth transitions between levels. Restrooms must also have ample space for wheelchair users, with entrances that open in both directions and sufficient manoeuvring space. Prioritising such design elements enables universities to create inclusive environments that improve mobility and the overall experience for PWD students (Ashraf and Rahat, 2023). Therefore, once expectations regarding space manoeuvrability aren't well met, there is usually a vulnerability to an inefficient use of the residential premises. Accidents involving disabled students on campus often result from inadequate barrier-free facilities and design flaws that compromise safety and accessibility.

The key scope of this article is to build on existing debates about the inclusivity of university accommodation facilities, especially on African public campuses. Several studies on facility inclusivity linked to space utilisation have largely been quantitative and have lacked empirical and policy contexts in Uganda. Thus, users' narratives, captured and analysed qualitatively, provide greater clarity on aspects of inclusivity that are generally addressed in the existing literature, especially in the Ugandan context, which has been underexplored in this regard. Other specifics to be addressed by this article include users' gender-specific experiences and the manoeuvrability of site works. Additionally, the narratives explored in this article provide the necessary accommodation for user feedback, which can guide building managers and policymakers in planning and installing fit-for-purpose facilities and equipment in the university residential halls.

2. Methods

2.1. Design

The study utilised a descriptive research design with a mixed-methods approach, though largely qualitative. This choice enables a comprehensive understanding of how inclusive design elements influence space utilisation for PWDs by combining statistical data and personal experiences. A descriptive design is well-suited for assessing specific design elements, such as ramps, elevators, and accessible restrooms, and their influence on PWDs' use of space. This

choice enables a broad understanding by collecting statistical insights and personal experiences of users and decision-makers(Creswell, 2009).

2.2. Study area

The selected case study area was Makerere University, Kampala. Makerere University is the oldest public university in Eastern and Central Africa. The university was chosen as the case study because of its large and diverse student body, including several PWD students. However, the current official records do not provide an accurate picture of the total numbers relied upon in this research. Such a presence would provide a valuable setting for analysing the experiences PWD users encounter when using non-inclusive access facilities in residential spaces. Examining a university of this magnitude thus provides a comprehensive view of accessibility challenges and possible solutions towards inclusivity of university access facilities.

Additionally, Makerere University's halls of residence face significant accessibility challenges due to their outdated design and infrastructure. Many of these halls were built before modern accessibility standards were established and feature narrow doorways, steps, and insufficient space for mobility aids. Makerere's diverse range of residence halls, with varying designs and accessibility standards, makes it ideal for assessing how facilities lacking conventional inclusive design elements affect PWD space utilisation. Furthermore, unlike other institutions, Makerere lacks a dedicated residential hall specifically designed to accommodate the unique needs of PWDs. This makes Makerere an ideal case for analysing the challenges, perceptions, and experiences of PWDs regarding space utilisation in residential environments.

2.3. Study population

In this study, the units of analysis included PWD students residing in the Makerere University halls. There were fifty-four PWD respondents. The key informants included university administrators at different levels, staff from the Disability Resource Centre, Estate/Facilities Managers, and hall administrators. Additional key informants included counsellors from the University Counselling Services, faculty members from the Department of Architecture and the Makerere University Students' Guild members (N=19). Finally, support staff totalling 29 formed another segment of key informant respondents, including cleaners, canteen attendants, dining staff, and PWD guides. In this paper, respondents have been classified according to the allocated acronyms: PWDs (CA), Administrators (CB), and Support staff (CC).

It was vital to separate the two key respondent categories, 'CB' and 'CC', because of the unique responses expected from each. For 'CB', the researchers expected responses on the policy strategy and direction. In contrast, for CC, the expected responses would focus on the challenging hotspots to drive the discussion toward the design shortfalls of the access facilities. Finally, we applied the principle of data saturation. For CA, saturation was reached at 40 responses; for CB, at 15; and for CC, at 20. The additional numbers after the saturation point are from the authors' effort to ensure that no additional or diversionary responses were obtained.

Overall, it was important to engage the key informants, as they were better placed to provide input on the policy and design issues of the university's accommodation facilities. They would further comment on the university's strategy/plan for inclusivity of its facilities and, in a way, help triangulate responses from the student PWDs. Eventually, the highlighted respondents collectively offered a well-rounded perspective on accessibility and inclusivity at Makerere University.

2.4. Sampling

A representative sample was selected using purposive and snowball sampling techniques. The techniques enabled targeted selection of participants who could provide valuable insights specific to the study objectives, such as PWDs residing in university halls and key informants involved in accessibility and facility management. Such insights were further aided by the tools adopted, such as 'questerviews' (Adamson et al., 2004), interviews, and FGDs. This sampling approach ensures a comprehensive, representative sample that reflects the experiences and needs of PWDs. Specifically, the purposive sampling targeted key informants**,** such as university administrators and support staff, with specific knowledge of the design and management of access facilities. The selected key informants would further elucidate the university's policy strategies regarding the inclusivity of access systems.

The uniqueness of the snowball sampling strategy made it relevant for selecting the PWD respondents. The snowball technique usually identifies and recruits participants through referrals from initial subjects. It starts with a small group of known individuals who refer others from their networks, creating a "snowball" effect (Geddes et al., 2018; Mubiru et al., 2022). The selection of PWDs through snowball (save for their leaders, who were known and picked through a purposive technique) was mainly based on two reasons: Firstly, the PWDs belonged to the Hard-to-Reach or identify Population category, which is usually disenfranchised when selected through random techniques. Starting with a few known individuals, this method allowed the researcher to reach additional participants through referrals, particularly those who may not actively participate in disability groups/associations but still have relevant experiences to share. Additionally, potential respondents were reluctant to identify themselves for inclusion in official records, anticipating stigma (Cormier, 2022). Yet for others, it was a mindset issue (Waitoller and Thorius, 2022), as they did not subscribe to the disability perception. So, the incompleteness of official records of PWD numbers constrained the researchers to the snowball sampling approach. Secondly, by relying on referrals, snowball sampling helped establish trust, as participants felt more comfortable participating when approached through their trusted social networks. This encouraged more honest and open sharing.

2.5. Data collection

Data were gathered from fifty-four PWD respondents, through unstructured questionnaires, interviews and focus group discussions (FGD), with a choice determined by the respondents' convenience, and a vital need for data triangulation. The tools were designed to assess the adequacy, usability, and comfort of access facilities for PWDs. Additionally, space utilisation metrics, such as the count of accessible rooms and communal areas, were documented. Although questionnaires are widely used in quantitative research (Humble, 2020; Yin, 2003), the unstructured nature of the questions allowed the collection of qualitative data to weigh users' experiences and perceptions. Such tools have been dubbed 'Questerviews' by Adamson et al. (2004).

In addition, in-depth interviews and focus group discussions allowed participants to share experiences and challenges, and to suggest improvements to the inclusivity of the access facilities in the residential spaces. Together, these methods comprehensively analyse the current design's inclusivity and functionality (Kumar, 2018). Thus, such respondents had the option of either completing the questionnaires online or in hard copy. Therefore, when

designing the unstructured questionnaires, we followed a similar line of questioning adopted for the interviews to help us gather the required qualitative data.

Data was also collected through observation. During the data collection phase spanning two weeks, the researchers visited the study area and conducted strategic observations of the residential halls and their siteworks to assess the existing visible conditions. During observation, we particularly focused on the location and distribution of access facilities. Other components under focus included the specific design, finishing materials, and condition of the facilities. Also, the presence or absence of specific facilities in the residential spaces was our focus. Such a surveying technique helped gain a direct understanding of the environment and identify additional insights not captured by other data collection methods.

Finally, the researchers collected data through FGD. The researchers conducted two FGDs, with six respondents each, comprising PWD students and their group/association leaders. The key asset of this method lies in its ability to efficiently explore participants' attitudes, perceptions, beliefs, and experiences in a dynamic group setting, enabling interaction and dialogue among participants (Kumar, 2018). Focus group discussions were instrumental in strengthening and balancing the responses from the interviews and in clarifying some of the components observed by the researchers. If the FGDs were not conducted, the data collected from the other methods and their eventual analysis would be lopsided. Therefore, the FGD strategy wasn't applied as a stand-alone; rather, it played a secondary role in strengthening the other methods.

2.6. Analysis

To analytically examine the experiences, challenges, and attitudes of PWD users when using or manoeuvring residential space facilities, the authors adopted a content analysis technique. Using this technique, the collected data were categorised, coded, analysed, and presented, as recommended by Braun and Clarke (2021). Themes and sub-themes were generated from categorised interview and FGD responses. The thematic analysis was employed to examine patterns and themes in how PWDs interact with access facilities in residence halls and the policy shortfalls associated with them. English was used for field data collection, and audio recorders were used in some sessions with respondents' consent. The study then undertook transcription later, thematically grouping and coding for more appropriate analysis. Some of the key categories rotated around: manoeuvrability, gender-specific access vulnerabilities, utilisation of common areas, provision of human assistance for PWD daily movement, and the actual distribution and orientation of the facilities. After that categorisation, themes were developed to guide the eventual analysis and discussion.

While transcribing the information, the authors were keen not to deviate from the real or key meaning (Mubiru, 2023; Stuckey, 2014). Additionally, the transcription was conducted to avoid bias and distortion of the study's key target. Importantly, direct quotations from interview transcripts were used to illustrate themes and provide the context for the respondents' responses.

2.7. Ethical considerations

Several ethical protocols were followed in conducting this research. In addition to obtaining written consent from Makerere University, the researchers ensured that they first introduced

themselves to the participants and clearly explained the purpose of the study. This helped in obtaining the respondents' consent before data collection. Furthermore, personal information and narrations collected, such as names, recordings, and photographs, were kept anonymous. In reporting the respondents' narratives, the researchers adopted pseudonyms: PWDs (CA), university administrators (CB), and support staff (CC). The subsequent numbering of the responses and narrations from the respondents followed the initial pseudonym assigned to each respondent, for instance, CA1, CA2, etc.

3. Results

This study empirically examines the experiences, challenges, and perceptions encountered by PWD users regarding their manoeuvrability and utilisation of access facilities in the residential spaces of Makerere University. This study attempted to balance user experiences, design inclusivity, and administrative and policy compliance with inclusivity expectations. The analysis of this subject matter was presented through particular themes, including: gender-specific accessibility challenges, mobility within accommodation facilities, selective facility positioning, ground-floor accessibility limitations, and manoeuvrability in common areas.

3.1. Gender of Respondents

The gender distribution of respondents in this study was essential to understanding the distinct impact of the unavailability of inclusive access facilities on both male and female PWDs. The higher proportion of male PWD students (60%) compared to females (40%) in this study may reflect enrollment trends or disparities in access to university education(Githinji, 2013) (see Figure 1). Hence, analysing these PWD gender trends helps in understanding the varying degrees to which the absence of inclusive design affects the challenges that both PWD genders experience when using university accommodation facilities.

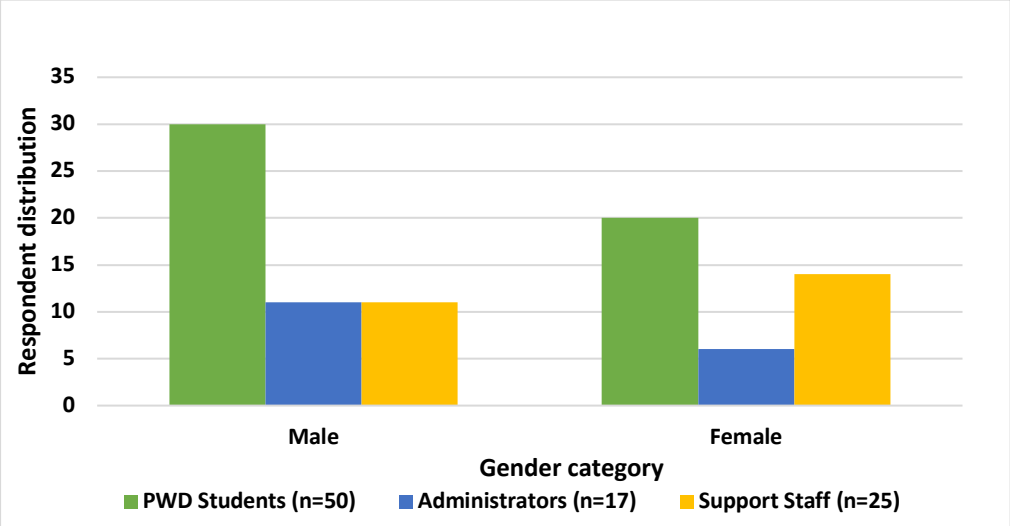

Figure 1: A Graph Showing the Distribution of Participants by Gender. Source: Field Data (2024)

Gender of the PWDs was further important in this study, as it could influence space utilisation patterns, mobility challenges, and the effectiveness of accessibility interventions of both male and female PWD users of multi-storey accommodation facilities. This resonates with Imrie (2016), who suggests that men and women may experience built environments differently due to physiological and social factors affecting how they navigate university halls of residence.

Therefore, it was important to understand the user experiences in the absence of clearly inclusive facilities.

3.2. Gender-Specific Challenges Faced by PWDs in Halls of Residence

a. Bathroom Accessibility Issues

A significant proportion of PWD female students (65%) reported difficulties using bathrooms compared to 58% of their male counterparts. Some scholars suggest that gender-sensitive accessible facilities are often overlooked in institutional settings, leading to disparities in bathroom usability (Imrie, 2016). Female PWDs would experience additional barriers related to privacy, menstrual hygiene, and the unavailability of gender-appropriate modifications, which are crucial for independent use of sanitary facilities. Additionally, Rohwerder (2015) claims that the absence of accessible disposal units, that are usable even if one is physically challenged, especially units to accommodate female-specific waste and gender-specific bathroom designs, can negatively impact the PWDs' comfort and dignity. On the other hand, male PWDs' concerns largely focused on the lack of supportive fixtures, such as urinals with handrails, to protect them from slippery surfaces. Such fixtures, though necessary for non-PWD users, are recognised as extremely vital for individuals with mobility impairments (Steinfeld & Maisel, 2012). Additionally, respondent CA1 reported:

> "The doors in bathrooms are so hard to push at Africa Hall. I come with my crutches and a bucket, but pushing the door often makes me fall. The toilets have mini stairs to climb to where I'm supposed to squat—it's so hard and painful to access. There are no grab bars to support myself. It's terrible. I always avoid using the toilets here and prefer to use the toilets at my department."

This narrative highlights the lack of essential supportive access features, such as grab bars and easy-to-open doors, which are critical for the safe and independent use of bathrooms by PWDs, especially those who are physically challenged.

b. Building Manoeuvrability

A high percentage of both genders report challenges with movement within halls of residence (72% of female and 68% of male PWDs). Such statistics suggest that most access facilities remain inadequate, making navigation difficult regardless of the gender of the PWD user. Studies indicate that poorly designed pathways, staircases, and inaccessible doorways significantly hinder mobility for PWDs in university environments (Alhusban and Almshaqbeh, 2024). Furthermore, female PWDs may experience greater mobility constraints due to physical strain linked to biological factors such as menstruation-related fatigue (Van den Bosch and Sang, 2017), and the location and design of the dumping facilities of their menstrual waste.

The lack of sanitary disposal units and the poor maintenance of shared facilities exacerbate the issue. Female PWDs are more likely to face difficulties due to the need for private, well-maintained, and gender-sensitive sanitation infrastructure. In contrast, while male PWDs also report challenges, their needs are more closely related to general cleanliness and availability than to gender-specific concerns, as Mont and Nguyen (2018) opined.

PWD female students (85%) reported higher privacy concerns than PWD male students (55%). This suggests that privacy is critical to the design of accessible accommodation facilities, particularly for female students (Wernsman, 2008). In mixed-gender residential halls, female PWDs may feel unsafe due to a lack of secure, designated spaces, increasing their discomfort and limiting their willingness to use shared facilities (Steinfeld and Maisel, 2012). The absence of gender-sensitive modifications in the halls, such as adapted spaces for assistive devices, also affects the overall usability of residential spaces for male PWDs (Imrie, 2016). Inclusive housing policies that consider the privacy concerns of users, irrespective of disability status (De Macedo et al., 2022), have been shown to improve overall well-being and space utilisation for PWDs.

3.3. Mobility in the accommodation facilities

This study assessed the distribution and performance of ramps, elevators, bathroom accessibility, and other accommodation facilities, with respect to their non-inclusiveness and the subsequent influence. The findings indicate that current access facilities partially address PWDs' needs but do not fully meet their preferences. While some ramps exist, their design and usability remain limited, indicating gaps in adherence to universal design principles. For instance, only 10% of ramps were distributed across halls, and no elevators/lifts were installed in any of the buildings. Although there are visible efforts towards inclusivity, such as the provision of a few ramps, the halls' overall design shows minimal compliance with universal design principles. The mismatch between facility design and the mobility requirements of PWDs significantly affects their navigation and space utilisation. A PWD respondent stated:

> "At first, I lived in Mitchell Hall, but navigating the area felt impossible, especially on the first day when I tripped over a trench near the entrance and around our block. I later moved to University Hall, but the staircases and live fences with barbed wire forced me to take longer, often unsafe routes to get around. No hall is safe for me; you just have to learn to live the harsh way." (CA2)

This response emphasises systemic design flaws that hinder accessibility, to the extent that some PWD users resign themselves to their circumstances. For instance, steep ramp gradients and poorly maintained pathways exacerbate difficulties for PWDs, leading to injuries and reduced mobility. Comparing these findings with scholarly insights reveals consensus with Kadir and Jamaludin (2012). Those who assert that functional ramps, elevators, and accessible pathways are vital for reducing injury risks and facilitating safe movement for PWDs.

The distribution of facilities, such as ramps, was uneven, making them less effective in providing consistent access. Additionally, some ramps are too steep, and pathways are narrow, hindering usability, especially for wheelchair users. Safety is also a concern, as the lack of handrails on ramps and the presence of hazardous live fences further increase the risk of injury, creating significant barriers to mobility and accessibility for PWDs. Such deficiencies create a mismatch between the design and mobility needs of PWDs. For example, a wheelchair user's journey within the hall involves navigating poorly designed ramps, often leading to frustration or accidents. Thus, this study reveals that despite some attempts to provide inclusive facilities, systemic challenges and poor design undermine accessibility for PWDs in Makerere University halls. Addressing these gaps requires prioritising universal design principles, regular maintenance, and stakeholder engagement to ensure that facilities truly meet the preferences and needs of PWD users.

Furthermore, entrances to several halls, including Complex and Livingstone, are poorly designed, featuring steep steps without alternative ramps, effectively restricting PWDs from accessing their residences independently. These structural barriers not only hinder mobility but also contribute to social isolation and the underutilisation of key spaces, as many PWDs avoid areas that are difficult to navigate.

The study assessed how well PWDs can navigate and utilise residential spaces at Makerere University, given the existing access facilities. Findings indicate that while some modifications have been made, significant shortcomings persist, highlighting the urgent need for comprehensive improvements to ensure accessibility and inclusivity across all residence halls. A respondent from Nsibirwa Hall shared that:

> "The pathways are too narrow and uneven, making it very difficult to move. Sometimes, I need someone to assist me because the terrain is not manageable for my wheelchair." (CA3)

Another respondent from Mitchel Hall expressed the opinion as follows:

> "The corridors are narrow and often crowded, on top of that, surrounded by an open trench. On my first day here, I fell into the trench while trying to navigate the pathway, and since then, I have avoided using it as much as possible. I walk using the columns by touching one by one until I reach my room." (CA4)

These narrations and experiences highlight the everyday struggles PWDs face due to non-inclusive designs and maintenance of pathways, which are crucial for seamless mobility. Such observations align with those of Imrie (2016), who noted that poorly designed pathways and narrow corridors limit mobility and contribute to social isolation among PWDs.

Furthermore, Steinfeld and Maisel (2012) emphasise that accessible pathways are a cornerstone of universal design, enabling equal participation and independent manoeuvrability within the built environment. The results underline the urgent need for inclusive design interventions to improve corridor and pathway accessibility. Addressing these challenges would significantly enhance the usability and satisfaction of spaces for PWDs in university buildings.

3.4. Selective positioning of facilities/ distribution bias

Respondents indicated that access features distributed in the university residential halls often fell short of accommodating the full spectrum of disability needs, irrespective of gender. A respondent with mobility impairments at Lumumba Hall said:

> "While ramps provide access to the main entrance and the PWD level, there are no ramps to the dining hall, which is situated on a raised level above the ground floor. Access to the dining hall is only possible via stairs, so we must order food and pay a delivery fee to our rooms. Though we would prefer to eat in the dining hall and watch TV there, the lack of ramps limits this option." (CA 5)

Such a narration by CA 5 implies significant limitations in mobility and space, restricting the freedom of movement for PWDs. Additionally, such a predicament entails additional expenses likely to be incurred by PWD users to enable them to adequately utilise some services. Such

costs may not be sustainable, implying that users who cannot manage them in the long term may opt to vacate the accommodation or suffer through.

Similar concerns were exhibited by respondents with visual impairments. For instance, respondent CA6, residing in Nkrumah Hall, stated, “It's risky to move around the hallways because there are no tactile markers or audible signals to help guide me”, supporting Chidiac et al. (2024) view on the importance of tactile markers in inclusive spaces. The absence of proper safety features, such as grab bars on the walkways at Mitchel and University Halls, attracted similar responses. Such observations indicate a gap in design elements that affect PWDs’ ability to navigate independently and safely within the halls.

Regarding corridors and pathways, it was noted that inadequate space design makes PWD navigation difficult. For instance, the narrow pathways and obstacles, such as open trenches and uneven surfaces, severely limit mobility, particularly in Complex Hall and University Hall. According to the Uganda National Accessibility Standards (Uganda National Action on Physical Disability, 2015), corridors should have a minimum width of 1.3m and preferably 1.5m to allow proper manoeuvrability for wheelchair users. For two-way wheelchair traffic, the minimum width should be 1.5m, preferably 1.8m. The slope of accessible pathways should not exceed 1:20 (5 cm per meter), and the surface must be smooth, continuous, firm, and non-slippery.

3.5. Ground Floor Accessibility Limits

Many respondents noted that their functionality is limited even when ramps are present. For example, a PWD from Africa Hall mentioned that ramps only provide access to the ground floor, preventing movement to upper floors for gatherings or meetings. Such an observation, which aligns with Rahman et al. (2024), highlights a significant gap between the design of accessibility features and the mobility needs of PWDs, thereby restricting their participation in various activities within the halls. The partial access provided by these ramps reinforces a dependency on others or excludes PWDs from important events, making it clear that the design of these facilities is inadequate for promoting autonomy and full inclusion. This finding suggests a need for comprehensive redesigns that provide access to all floors, eliminating the need for peer assistance or exclusion from activities.

3.6. Manoeuvrability in Common Areas

Access to social enjoyment in the common areas is a key ingredient of inclusivity in student accommodation. According to this study, such common areas included corridors and stairways, bathroom facilities, study rooms, compound areas, and dining spaces (see Figure 2).

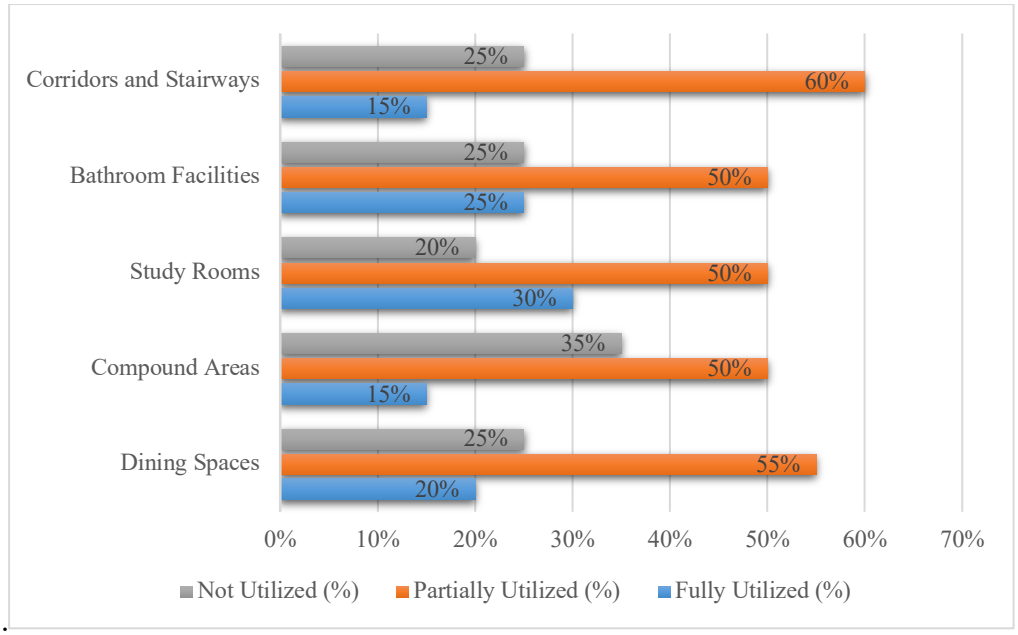

Figure 2: A Graph Showing Utilisation of Common Areas in Halls of Residence
Source: Field Data (2024)

The experiences of PWD users regarding certain critical portions of common areas varied. For instance, regarding dining spaces, a respondent at Africa Hall explained:

> "The dining spaces are slippery, crowded and not accessible for me because there are no ramps to reach them. I have to depend on someone to bring me food and avoid going altogether." (CA 7)

Concerning a further experience with compound area accessibility, a respondent from Livingstone Hall stated:

> "I love spending time outside, but the compound areas are surrounded by barbed wire hidden in the live fences, uneven terrain, and stairs. Moving around is exhausting and unsafe. Since the time I fell into the fences and got bruises, I stopped using them." (CA 8)

Additionally, with common study rooms, a respondent residing at Africa Hall noted:

> "The study rooms are easier to access compared to other areas, but they still have narrow doorways, which can be a problem for my wheelchair." (CA 7)

The narrations highlight the critical importance of common areas in student accommodation, as accessibility compromises the intended maximal utilisation of the accommodation halls by PWD users. Such an assertion aligns with Amole (2009), who indicated that poorly designed common areas hinder the independent use by PWDs, thereby limiting their engagement with communal activities, which would be instrumental in boosting their relaxation and socialisation. Steinfeld and Maisel (2012) also argue that common areas, such as dining halls, study rooms, and compounds, should prioritise universal design features, such as ramps, wide pathways, and grab bars, to promote inclusivity and safety. Moreover, Naami (2019) emphasises that the absence of essential features, such as non-slip flooring and wide doorways, restricts accessibility and contributes to underutilisation and under-enjoyment of the accommodation facilities. In such a case, if the accessibility of common areas is not prioritised, then achieving the highest and best use of students' accommodation facilities remains a fallacy.

4. Conclusion and Recommendations

This study delved into understanding the experiences, challenges, and perceptions encountered by PWD users regarding their manoeuvrability and utilisation of access facilities in the residential spaces of Makerere University. The analysis of this subject matter has been presented through five thematic areas: PWD gender-specific experiences with non-inclusive facilities, mobility within accommodation facilities, selective positioning of facilities, ground-floor accessibility limitations, and manoeuvrability in common areas. Overall, the findings underscore the vital role of inclusively designed university accommodation facilities in enabling PWDs to utilise residential spaces at Makerere University optimally. While some efforts have been made to incorporate accessibility features such as ramps, elevators, and accessible bathrooms, persistent design flaws and maintenance gaps have evidently hindered effective space utilisation and compromised their safety. For instance, several ramps are steeper than recommended guidelines, and accessible bathrooms are poorly maintained or lack essential features, such as grab bars and adequate turning space for wheelchair users. This has considerably compromised the safety of PWDs and their optimal enjoyment of the accommodation facilities.

Given the findings, it is clear that PWDs experience significant challenges navigating their residential spaces, often relying on helpers or adopting inconvenient, undignified means to move around. Ultimately, while the presence of inclusive access facilities reflects a commitment to accessibility, their inadequacies highlight the need for improvements in design, maintenance, and policy enforcement to ensure that PWDs can fully utilise their living spaces with ease, dignity, and independence.

This study has established that the design and condition of access facilities significantly influenced the extent to which PWD users utilise accommodation spaces. Even with well-designed ramps, spacious hallways, and functional elevators, there is still a gap in the more inclusive and efficient utilisation of the spaces. Despite such difficulties, some PWDs adapted by crawling, receiving assistance from peers to move around, or covering long distances to lecture rooms, university buildings, playgrounds, and revision areas, thereby improving accessibility rather than relying on inaccessible spaces within their halls of residence. To foster a more inclusive and equitable living environment, Makerere University and other public campuses should take proactive steps to customise access facility designs, enforce universal accessibility standards, and implement regular maintenance programs. Additionally, establishing emergency evacuation protocols tailored explicitly for PWDs is essential in ensuring their safety. By addressing these deficiencies, public universities would enhance accessibility, promote autonomy, and create a supportive environment where PWDs can fully participate in academic and social activities without unnecessary barriers.

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