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ACCESSIBILITY OF WASHROOMS IN BUS TERMINALS IN WESTERN KENYA TO LEARNERS WITH PHYSICAL DISABILITY

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Abstract: Learners with physical disability in the western part of Kenya frequently make use of bus terminals during in the trip to and from school. Special schools attended by learners with a physical disability are few in number and far removed from the residences of most students thereby necessitating travel. Bus terminals located herein become obligatory points of passage for almost half of learners with physical disability in Kenya since seven out of thirteen special schools are located herein. This study, therefore sought to establish the accessibility of washrooms to learners with a physical disability whenever they made use of bus terminals. A cross-sectional survey design targeting 317 respondents who were sampled from a population of 1,525 was used. Data was collected through the use of questionnaires, technical measurements and observation schedules. It was established that washrooms in the study area enhanced spatial exclusion due to the presence of barriers at doorways and constricted washroom stalls.

Keywords: Universal design, spatial inclusion, physical disability.

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Introduction

Children with disabilities (CwD) have universally suffered discrimination, violence and exclusion (International Save the Children Alliance, 2001). To counteract this discrimination, the rights of children were advocated for through legislations (Munro, 2001). In 2007, when Kenya signed the International Convention on the Rights of Persons with Disabilities, she stated her commitment to protect the rights of persons with disability by promoting access to facilities open to the public (Kiai, Onsando & Mwaura, 2007). Prior to this, the Government of Kenya enacted the Persons with Disabilities Act (PDA) in 2004 (GoK, 2004). The PDA addresses the provision of accessible terminals under the area covering rights of People with Disabilities (PwD) and equalization of opportunities.

The design and layout of washrooms have a direct bearing on the independence of learners with physical disability (LwPD) during instances when they use terminals. The concept of accessibility brings the idea of 'everybody's possibility to access' (Duarte & Cohen, 2007). The basis of Universal Design (UD) principles is the provision of environments which are usable by all people (Lafferty, 2007). In the context of washrooms, the intent of UD is to simplify life for all users by making the facilities usable to all members of the populace, without locking out any segment.

A study by Ochieng, Onyango and Oracha (2010) investigated the accessibility of buildings in Kisumu Central Business District to people with physical disability. This study confirmed that numerous design barriers in and around buildings hampered mobility of people with physical disability. Another study which also investigated the accessibility of the pavements to people with physical disability was conducted by Ochieng, Onyango and Wagah (2014). This study noted that the pavements in the western part of Kenya did not enhance the independence of people with physical disability due to the presence of barriers in the pedestrian environment. Other than the pedestrian environment, the design of washrooms also has a direct bearing on the overall accessibility of a bus terminal. This study, therefore evaluated the design of washrooms in Western Kenya so as to establish the extent to which the spaces enhanced spatial inclusion of LwPD. The focus of the study was on LwPD enrolled in special schools since bus terminals were obligatory points of passage in the trip to school.

Methodology

The study was conducted through a cross-sectional survey design which was ideal since it enabled the researcher to collect data rapidly in the study area on the design of washrooms located in bus terminals at a given point in time (Oso & Onen, 2005). For the purpose of this study, the western part of Kenya was considered to be Kisumu County, Bungoma County, Homa Bay County and Kakamega County. These four counties have the highest prevalence of physical disability when compared with the rest of the Republic (GoK, 2008). The western part of Kenya comprises of the former Nyanza Province and the former Western Province. The study area cut across the major bus terminals in Kisumu County, Kakamega County, Homabay County and Bungoma County. Figure 1 shows the location of the study area.

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Figure 1. Map of Kenya Showing Position of Western Kenya

The population of LwPD who made use of the terminals in the study area (1,525 from which 317 respondents) was sampled. Since the study focused on the major terminals at which respondents terminated their trip, the distribution of the interviewees was such that 14% evaluated the design of Kakamega terminal, 34% evaluated Bungoma terminal, 26% evaluated the design of Kendu Bay terminal, while 26% evaluated the design of Kisumu terminal. The distribution of respondents in the study area has been presented in Table 1.

Table 1. Distribution of Respondents. Field Data, 2016. Source: author.

Bus Terminal Evaluated	No. of Special Schools around	Population of LwPD using	No. of Respondents	% of Total
Kakamega	1	209	43	**14%**
Bungoma	3	515	107	**34%**
Kendu Bay	1	400	83	**26%**
Kisumu	2	401	84	**26%**
Total	**7**	**1,525**	**317**	**100%**

Respondents were required to evaluate the design of the major bus terminal at which they terminated the trip to school. The distribution of respondents was such that: 14% evaluated Kakamega bus terminal, 34% evaluated Bungoma bus terminal, 26% evaluated Kendu Bay bus terminal, while an additional 26% evaluated Kisumu bus terminal. Respondents were proportionately distributed.

Data was collected through the use of questionnaires, technical measurements and observation schedules. Respondents were required to evaluate the design of washrooms based on the following parameters: washroom door size, threshold design, washroom stall size, presence of grab bars and whether washroom floors were slippery. The observation schedule was used to verify the following: the dimensions of washrooms, the presence of at least one washroom accessible to a person with a disability, the state of washroom floors- whether they were slippery or they enhanced mobility, and the design of washroom doors.

Results and Discussion

Socio-demographic Profile of Respondents

Gender and Age of Respondents

The target population for the study was 1,525 LwPD from which 317 respondents were sampled. The ages of the respondents varied between 11 years and 17 years. A presentation of the gender and age of respondents has been presented in Table 2.

Table 2. Gender and Age of Respondents.Field Data, 2016. Source: author.

Gender	11-13 Yrs.	14-16 Yrs.	17-19 Yrs.	Total
Female	18.9%	28.4%	3.5%	50.8%
Male	16.7%	25.6%	6.9%	49.2%
Total	**35.6%**	**53.9%**	**10.4%**	**100%**

In the trip to school, all the respondents aged 11-13 years travelled with an escort to school (18.9%), while some of the respondents aged 14-16 years (28.4%) travelled with an escort. None of the interviewees aged 17 -19 years (10.4%) travelled with an escort. Across the ages, it became clear that the percentage of LwPD attending the special schools who were 11-13 years (35.6%) were less than those who were 14-16 years (53.9%). There was, however a drastic drop in the percentage of respondents who were 17-19 years (10.4%).

The disparity of ages across the study area can be attributed to the fact that respondents were drawn from both primary and secondary schools. In the study area, there is a critical drop of respondents aged 17-19 attending formal educational institutions since they only constituted 10.4%, yet respondents aged 14-16 were 53.8%. It seems therefore that as learners get older, they tend to quit formal learning institutions. This finding is in line with an observation made by Mugo, Oranga and Singal (2010) who revealed that youth with disabilities usually "fall through the cracks".

Assistive Devices Used by Respondents

Respondents in the study area used assistive devices to substitute- to some extent- the missing or disabled limb. These devices also helped the learners to be independent since they enhanced movement from one place to another. Table 3 presents the distribution of assistive devices in the study area.

Table 3. Assistive Devices used by Respondents.Field Data, 2016. Source: author.

Assistive Device	Bungoma	Kisumu	Kendu Bay	Kakamega	Total
None	2.2%	15.5%	16.1%	7.6%	**41.3%**
Wheelchair	26.5%	4.7%	1.9%	0.3%	**33.4%**
Walking Stick	0.3%	0.6%	0.6%	0.6%	**2.2%**
Crutches	3.5%	5.4%	5.4%	3.2%	**17.4%**
Special Boots	1.3%	0.0%	2.5%	1.9%	**5.7%**
Total	**33.8%**	**26.2%**	**26.5%**	**13.6%**	**100%**

Across the study area, level of disability differed amongst the respondents who could either be classified as wheelchair users or ambulant disabled. Both the wheelchair users and ambulant disabled made use of the four bus terminals in the study area. These findings further reveal that ambulant disabled were more than wheelchair users. Ambulant disabled include those using special boots, walkers, crutches and walking sticks. The respondents who did not use any assistive device in the study area had neurological disorders which greatly reduced their strength. By extension, the dexterity with which this group manouvered within bus terminals was significantly reduced. This group of respondents was also classified as ambulant disabled.

Barriers at Washroom Entrance

Respondents in the study area were required to evaluate washroom entrances. The parameters used for the evaluation included: the presence of high thresholds, the presence of stairs, and the presence of ramps. Equitable access at washroom entrances was guaranteed when thresholds were no higher than 13 mm and when stairs and ramps were provided next to entrances. These provisions would ensure that entrances were accessible to all. A breakdown on the state of washroom doors has been presented in Table 4.

Table 4. Barriers Present at Washroom Entrance.Field Data, 2016. Source: author.

Bus Terminal	No Barrier	High Thresholds	Ramped access with no stairs	Total
Bungoma	2.2%	31.5%	0.0%	**33.8%**
Kisumu	5.7%	20.5%	0.0%	**26.2%**
Kendu Bay	25.6%	0.0%	0.0%	**25.6%**
Kakamega	1.6%	0.0%	12.9%	**14.5%**
Total	**35.0%**	**52.1%**	**12.9%**	**100%**

Across the study area, the barriers respondents came across were either high thresholds or ramped access with no stairs. More specifically, half of the respondents encountered high thresholds at washroom entrances (52.1%), while 12.9% encountered ramped access with no stairs. A third of respondents in the study area, however, experienced no barrier at the washroom entrance (35%). The most common barrier in the study area was high thresholds as highlighted by more than half of the respondents (52.1%). These results show that more than three-quarters of respondents experienced difficulty while making use of the entrances in the study area. Table 5 outlines further whether difficulty experienced was dependent upon assistive device used.

Table 5. Obstacles at Washroom Entrance. Field Data, 2016. Source: author.

Assistive Device	No Barrier	High Thresholds	Ramped access with no stairs	Total
None **(Neurological disorders)**	24.0%	9.8%	7.6%	**41.3%**
Wheelchair	1.9%	31.2%	0.3%	**33.4%**
Walking Stick	0.9%	0.9%	0.3%	**2.2%**
Crutches	5.7%	8.8%	2.8%	**17.4%**
Special Boots	2.5%	1.3%	1.9%	**5.7%**
Total	**35.0%**	**52.1%**	**12.9%**	**100%**

Respondents who did not use assistive devices were 41.3% of which more than half (24%) experienced no barrier at the entrances, less than a quarter (9.8%) highlighted the presence of thresholds as a barrier, while 7.6% confirmed that ramped access with no stairs was a barrier. The greatest barrier experienced by respondents who had neurological disorders was the presence of high thresholds (9.8%). Wheelchair users were 33.4% of which almost all experienced barriers due to high thresholds (31.2%), while a significant portion experienced barriers at the ramps (0.3%). This highlights the fact that the slope of the ramp was too steep for 0.3% of the respondents. High thresholds presented a barrier to slightly less than half of the walking stick users (0.9%), half of crutch users (8.8%) and slightly less than half of special boot users (2.5%).

The distribution of responses amongst respondents who experienced difficult due to the presence of ramped access with no provision of stairs along aide was such that respondents with neurological disorders reported the highest occurrence (7.9%), when compared to crutch users (2.8%), special boot users (1.9%), wheelchair users (0.3%) and walking stick users (0.3%)

The variation in responses can be attributed to the fact that entrances of washrooms in the study area were designed differently- with some washroom doors having thresholds while others had ramps. Some respondents pointed out that one barrier arose due to the provision of ramps at washroom entrances, while an entrance having steps was lacking. This phenomenon was present in Kakamega terminal as is evidenced in Figure 2.

Figure 2. Ramped Access with no stairs (Kakamega Terminal). Field Data, 2016. Source: author.

The main barrier in Kakamega bus terminal was that a ramped access had been provided at the main entrance of washrooms. Such a provision would benefit those on wheelchair while other disabled persons would experience difficulty traversing over the ramped surface. The researcher noted that thresholds were absent in entrances to washrooms in Kakamega. Other than ramped access with no stairs, respondents also pointed out that the presence of high thresholds was a barrier as has been highlighted in Table 6.

Table 6. Threshold Heights at Washroom Entrances.Field Data, 2016. Source: author.

Bus Terminal	Threshold Height in mm
Bungoma	160
Kisumu	150
Kendu Bay	155
Kakamega	0
Mean Height	**116.3**

Threshold heights varied between 150 mm and 160 mm as has been illustrated in Table 4.26. In Bungoma, respondents making use of washrooms encountered thresholds of 160 mm, in Kisumu the thresholds were 150 mm, in Kendu Bay the thresholds were 155 mm, while in Kakamega there were no thresholds at washroom entrances. The mean threshold height in the study area was therefore 116.3 mm. In order to establish if there was a significant difference between threshold height in the study area and the recommended threshold height, the study employed a t test. The study adopted a 95% confidence level, an α of 0.05 and a test value of 13 mm.

$$\overline{X_1} = 116.3\ mm$$

$$\mathrm{X} = 13\ \mathrm{mm}$$

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$$t_{0.05} = 2.641$$

$$t_{e0.05} = 1.96$$

The presence of a computed t value which was significantly larger than 1.96, confirmed that there was a significant difference between threshold heights in the study area and the recommended threshold height. Threshold heights in the study area were much higher than the recommended height, given that in the study area the mean height of thresholds was 116.3mm, while the recommended height is 13 mm. The mobility of the learners was hampered during instances when they made use of the washroom entrances due to the presence of thresholds higher than 13mm.

On the presence of thresholds, Solidere (2004) confirms that high thresholds present a barrier to potential users. Joines (2009) explains further that most environments are designed for the average individual, a myth which only exists in anthropometric tables and ergonomics classrooms. Application of such ergonomic principles was seen clearly in the assumption that all members of society could be able to use thresholds which ranged in heights of between 150 mm to 160 mm. The presence of high thresholds confirmed further that the assumption of the designers of the bus terminals is that the “average” individual would use these thresholds.

To ensure equitable access over thresholds, Diversity Management and Community Engagement (2004) confirm that thresholds should not exceed 13 mm in height. Solidere (2004) clarifies further that thresholds higher than 6 mm should be bevelled or have sloped edges to facilitate the passage of a wheelchair. In order to ensure safe access over thresholds in the study area, there is a need for provision of bevelled thresholds no higher than 13 mm in the study area.

To cater for people who have non-ambulatory disabilities, Solidere (2004) proposes that ramps should be provided alongside any flight of steps. The design of these ramps should incorporate handrails having a smooth continuous surface from the top to bottom of the ramp, without breaking the handhold (Diversity Management and Community Engagement, 2004). Within the study area, it is commendable that a ramp had been provided at the entrance of washrooms in Kakamega bus terminal. The only point of departure is that there were no stairs next to the ramp. Such a scenario locked out ambulant disabled. This category encompassed those using special boots, crutches, walking sticks and those having neurological disorders.

Provision of ramps next to staircases would help ensure that the ambulant, ambulant – disabled and wheelchair users were able to use the same spaces. In this way, spatial inclusion would be enhanced. Provision of ramps next to stairways would also be in line with the UD principle which advocates for flexibility in use. This principle provides for adaptability to users pace, while providing choice in methods of use. Within the study area, provision of ramps next to stair cases would ensure that the washroom entrances are accessible to all, regardless of physical status.

Lid (2013) explains further that UD is not planning and designing for people with disabilities but acknowledging diversity in abilities among citizens. UD involves values, knowledge and practice. The values are dignity, equality and equal possibilities. Due to the condition of plurality, designers should plan for diversity physically, socially and spatially. Design of public places and institutions can be a manifest expression of respect for all individuals as equal citizens. Within the study area, provision of accessible doorways adhering to UD standards would help ensure that doorways were accessible.

Narrow Doorways

Another barrier highlighted by respondents was the presence of narrow washroom doors which impeded access. The researcher verified the washroom door sizes in the study area. Table 7 presents a breakdown of washroom door sizes in the study area.

Table 7. Washroom Door Widths. Field Data, 2016. Source: author.

Bus Terminal	Door Size in mm
Bungoma	790
Kisumu	790
Kendu Bay	700
Kakamega	670
Total	**737.5**

Door widths ranged between 670 mm, 700 mm and 790 mm. Washroom doors in Bungoma and Kisumu were 790 mm, doors in Kendu Bay terminal were 700 mm, while doors in Kakamega were 670 mm. The mean doorway width in the study area was 737.5 mm. In order to establish if there is a significant difference between washroom door size in the study area and the recommended washroom door size, the study employed a t test. The study adopted a 95% confidence level, an α of 0.05 and a test value of 900 mm.

$$\overline{X_1} = 737.5 \ mm$$

$$\mathrm{X} \ = 900 \ \mathrm{mm}$$

$$t_{0.05} = \ -5.255$$

$$t_{e0.05} = 1.96$$

The presence of a t value which is significantly less than 1.96, confirms that there is a significant difference between washroom door size in the study area and the recommended washroom door size. Washroom door sizes in the study area were narrower than the recommended door size, given that in the study area the mean height of washroom doors was 737.5 mm, while the recommended washroom door size 900 mm.

In the provision of accessible doorways, Douglas (2002) notes that a clear minimum width of 900 mm should be provided so that potential users can manoeuvre within the doorway without any difficulty. Presence of narrow doorways, in essence locks out potential users of washrooms who use assistive devices which require additional space. Since the normate template keeps a walking and fleshy body at the centre of thinking about design, buildings often fail to consider space requirements for bodies that use technologies to navigate space. In order to sustain itself, the normate template relies upon the impression that normates are normal, average, and majority bodies (Hamraie, 2013). A normate template is one held to operate between the 5th and 95th percentiles in ergonomics and anthropometrics. Within the study area, both wheelchair users and ambulant disabled experienced difficulty manoeuvring through narrow doorways.

A universally designed space can reduce dependence, ease burdens on strained relationships and empower multiple members of the social sphere. Individuals need not struggle to enter through entrances (Joines, 2009). The existence of narrow doorways in the study area confirmed that these doorways excluded some people from making use of the washrooms. The presence of narrow doorways passed out non-verbal cues to the wheelchair users and ambulant disabled that these doorways were designed solely for those who could “fit” in the given doorways. In this way, spatial exclusion was enhanced.

Narrow Wash Room Stall

Respondents in the study area pointed out that washroom stalls were narrow and this posed a barrier. The size of washroom stalls in the study area was defined by the washroom lengths and widths. The trend of responses has been presented in Table 8.

Table 8. Narrow Washroom Stall.Field Data, 2016. Source: author.

Bus Terminal	Washroom Stall Not Narrow	Washroom Stall Narrow	Total
Bungoma	6.9%	26.8%	**33.8%**
Kisumu	13.2%	12.9%	**26.2%**
Kendu Bay	6.9%	19.6%	**25.6%**
Kakamega	7.3%	6.3%	**14.5%**
Total	**34.4%**	**65.6%**	**100%**

The highest percentage of respondents who highlighted the presence of narrow doors used Bungoma bus terminal (26.8%). This percentage represented slightly more than a quarter of the respondents who made use of the study area. A further distribution of responses is such that a fifth of the respondents from Kendu Bay (19.6%), while slightly less than a fifth made use of Kisumu bus terminus (12.9%). Within Bungoma terminal, about three-quarters of the (26.8%) indicated that washroom stalls were narrow, while responses from Kisumu terminal was such that slightly less than half stated that washroom stalls were narrow (12.9%).

The trend of responses in Kendu Bay was such that almost two-thirds of the respondents (19.6%) indicated that washroom stalls were narrow while in Kakamega, slightly less than half indicated that washroom stalls were narrow (6.3%). Table 9 presents results for narrow washroom stalls based on assistive devices of respondents.

Table 9. Washroom Size.Field Data, 2016. Source: author.

Assistive Device	Stall Size Adequate	Narrow Washroom Stall	Total
None (Neurological Disorders)	18.9%	22.4%	41.3%
Wheelchair	1.9%	31.5%	33.4%
Walking Stick	0.3%	1.9%	2.2%
Crutches	10.1%	7.3%	17.4%
Special Boots	3.2%	2.5%	5.7%
Total	**34.1%**	**65.9%**	**100%**

Respondents who did not use assistive devices were 41.3% of which slightly more than half (22.4%) indicated that washroom stalls were narrow. Almost all the wheelchair users (31.5%) indicated that washroom stalls were narrow. Amongst walking stick users, more than three-quarters (1.9%) stated that washroom stalls were narrow. Crutch users were 17.4% of which slightly less than half (7.3%) confirmed that washroom stalls were narrow. Slightly less than half of special boot users (2.5%) stated that washroom stalls were narrow. The trend of responses reveals that more than three-quarters of the respondents experienced spatial exclusion due to narrow washroom stalls in the study area. The specific parameters used to evaluate the contributing variables to narrow washroom stalls were: washroom width, washroom length and washroom door opens into the cubicle.

Washroom Widths in the Study Area

Across the study area, washroom stalls had various widths as has been outlined in Table 10.

Table 10. Washroom Widths.Field Data, 2016. Source: author.

Terminal	Washroom Width (mm)
Bungoma	830
Kisumu	850
Kendu Bay	820
Kakamega	820
Total	830

Within the study area, the mean washroom stall widths was 830 mm. In Bungoma terminal, the washrooms had a width of 830 mm, in Kisumu the width was 850 mm, Kendu Bay 820 mm and Kakamega 820 mm. In order to establish if there was a significant difference between washroom widths in the study area and the recommended washroom width, the study employed a t test. The study adopted a 95% confidence level, an α of 0.05 and a test value of 1675 mm.

$$\overline{X_1} = 830\ mm$$

$$\mathrm{X}\ = 1675\ \mathrm{mm}$$

$$t_{0.05} = \ -119.5$$

$$t_{e0.05} = 1.96$$

The presence of a t value which was significantly less than 1.96, confirmed that there was a significant difference between washroom widths in the study area and the recommended washroom width. Washroom widths in the study area were significantly narrower than the recommended width, given that in the study area the mean washroom width was 830 mm, while the recommended washroom width was 1675 mm.

Washroom Lengths

Presented in Table 11 is a breakdown of washroom lengths in the study area.

Table 11. Washroom Length.Field Data, 2016. Source: author.

Bus Terminal	Washroom Length in mm
Bungoma	1580
Kisumu	1600
Kendu Bay	1480
Kakamega	1590
Total	**1562.5**

Within the study area, washroom lengths varied between 1480 mm and 1560 mm. Washroom length in Bungoma bus terminal was 1560mm, in Kisumu the length was 1540 mm, in Kendu Bay washroom length was 1480 mm, while in Kakamega bus terminal the washroom length was 1520 mm. The recommended washroom length as per UD standards is 1500 mm minimum by a recommended width of 1675 mm for use by persons with mobility aids or others requiring personal assistance (Diversity Management and Community Engagement, 2004). Within the study area, washroom lengths fell within the required lengths in Bungoma bus terminal, Kisumu and Kakamega. Washrooms in Kendu Bay fell short of this requirement by 20 mm.

The presence of narrow washroom stalls in the study area was a barrier to LwPD, especially the ones who used assistive devices. McLaren, Philpott and

Hlophe (1996) suggest that assistive devices enable people with disabilities to be independent so that they can function as active members of society. While these devices do not cure or eliminate challenges, they take advantage of the strengths of the disabled person; and then circumvent areas of difficulty (Mcguire, 2011). Once this compensation has been done then people with disability are able to achieve their individual lifestyle goals and ambitions (McLaren, Philpott and Hlophe, 1996).

Solidere (2004) identifies insufficient space in washrooms as a barrier to access. Lacey (2004) suggests that suitable and easily identifiable sanitary accommodation should be provided for all building users. This will involve combinations of general provision of accommodation for ambulant people with disabilities, those who need more space and wheelchair users. Sanitary facilities should be designed to meet the needs of all building users regardless of age, size, ability or disability. Adopting a UD approach will ensure that facilities can be accessed and used by a diverse population with an equitable level of convenience, understanding, choice, safety and comfort (Center for Universal Design, n.d.).

The presence of washroom widths which were significantly narrower than the recommended in enhanced spatial exclusion of individuals who could not operate within the widths set forth across the study area. Learners who had assistive device experienced spatial exclusion since these devices required additional space. The presence of narrow washroom in the study area therefore, meant that some LwPD were completely locked out of washrooms.

Doors Open into Washroom Cubicle

Another barrier highlighted by all the respondents was that usable space in the WC was compromised since doors opened into the toilet stalls. This phenomenon also contributed to constricted washroom lengths. Lacey (2004) suggests that doors to WC cubicles and wheelchair-accessible unisex compartments should open outwards. It is important however to ensure that the WC door does not open onto a circulation path to ensure the privacy of users (Pagel and Harris, 2002). During instances when they open into the cubicle, they should not encroach unduly on usable space. Where doors swing outward, an additional pull handle should be mounted horizontally close to the hinge side of the door (Diversity Management and Community Engagement, 2004). Where cubicle doors are outward opening, particular care should be taken in planning the layout of the toilet to minimize the risk of a person colliding with the door. Wherever possible, outward opening doors should open against an adjacent wall (Center for Excellence in Universal Design n.d.).

From the perspective of disability, UD is not planning and designing for people with disabilities but acknowledging diversity in abilities among citizens. UD involves values, knowledge and practice. The values are dignity, equality and equal possibilities. Due to the condition of plurality, there is need to plan for diversity physically, socially and spatially. Design of public places and institutions can be a manifest expression of respect for all individuals as equal citizens. Further, experiencing access contributes to giving individuals a social basis for self-respect as equal citizens. Usability is a subjective term. If design is to be usable by all people to the greatest extent possible, there is a need for knowledge from a vast number of different individual perspectives (Lid, 2013).

Conclusion

Inappropriate design of washrooms located in bus terminals of Western Kenya enhanced spatial exclusion of LwPD. This study also revealed that there were instances when respondents with neurological disorders experienced difficulty just as much as wheelchair users, crutch users, walking stick users and special boot users. A possible point of intervention in the provision of accessible washrooms would be the involvement of persons with disabilities in the design process. This segment of society can be able to guide designers on the components of accessible built environments. This scenario arises since they possess the experiential knowledge of spatial exclusion and can thereby suggest solutions for circumventing the design barriers.

Further, there is a disconnect between what the Country (Kenya) pledges to do as far as UD is concerned and what actually exists on the ground. On one hand, the government has enacted legislations, while ratifying international conventions which uphold UD. On the other hand, the washroom designs in the western part of Kenya confirm that designers of these public spaces did not consider UD requirements despite the existence of these legislations. Incorporation of UD parameters in the built environment, therefore requires more than just legislations.

In addition to this, the study revealed that UD is more than codes and dimensions since there were instances when the lengths of washrooms were within the recommended dimensions, yet some members of the populace stated that they experienced difficulty using the designed spaces. During this particular instance, washroom doors opened into the cubicle thereby constricting the space available in the toilet. This reveals that UD also encompasses intricate details of washroom design such as layout and door swing.

In conclusion, Universal Design places an onus on designers of the built environment to factor in cause-effect relationships of their design actions on the final consumers of living spaces.

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Appendices

APPENDIX I.STUDENT QUESTIONNAIRE

Dear Respondent,

This study intends to establish the design barriers in bus terminals which deter safety, independence and free mobility of students with physical disability in the trip to and from school. Please note that participation in responding to questions contained herein is voluntary. The information you provide will be kept confidential within the limits of the law. Your name will not appear in any report or publication of the research. The contents of this questionnaire will be safely stored in a place that is locked and will be destroyed at the end of the study.

Please answer the questions contained herein truthfully.

SECTION ONE: DEMOGRAPHIC QUESTIONS

Given below are questions on your demographic profile. Please answer them truthfully.

What is your age? _________

What is your sex?

Male

Female

Specify the town in which you live. ___________________

Type of assistive device used

__Wheel Chair __Crutches __Special Boots __Walking Stick __None (Neurological Disorders) Other (Specify)____________________

Name of School attended ____

Do you travel alone to school ____

Are there times you require assistance in using terminals? Please explain

List the major terminals you use in the trip to school

SECTION II: EVALUATION OF WASHROOM

Is your independence in washrooms hampered due to its design while maneuvering through the doorway due to its width?

__Yes __No

Tick the statements which describe the characteristics of the washrooms

Washroom doors are narrow and difficulty is experienced going through the doors.	Washroom doors are wide and difficulty is not experienced going through the doors
The threshold is high and difficulty is experienced using it.	The threshold is low and difficulty is not experienced maneuvering over it.
The wash room stall is narrow and difficulty is experienced turning inside the washroom.	The wash room stall is wide and difficulty is not experienced turning inside
Grab bars are absent	At least two grab bars have been provided around the sinks and WC
The washroom floor is slippery	The washroom floor is not slippery.

Please outline any other barriers that you encounter in using washrooms

APPENDIX II OBSERVATION SCHEDULE FOR BUS TERMINALS.

Name of Terminal____

1. County

   ____

2. **COMPARTMENTS**
   a. Is at least one compartment for each sex accessible to a physically disabled person?
   b. Is the accessible washrooms marked with the international symbol of accessibility?
   c. What are the dimensions of the washrooms?
3. **Washroom Floor**
   a. Describe the state of the washroom floor (Is it wet or dry)

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b. Is the wash room floor on skid or does it present a slipping hazard.

4. REST ROOM DOOR

a. Do the doors open outward unless sufficient space is provided within the toilet stall?

b. Are the doors lockable from the inside and releasable from outside under emergency situations?

c. Has a handle been placed on the door from the inside to facilitate closing?

d. Has another handle been provided on the outside

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