Journal of Accessibility and Design for All

Volume 13, Issue 2. (CC) JACCES, 2023. ISSN: 2013-7087

ACCESSIBILITY OF STUDENTS WITH PHYSICAL DISABILITY TO PUBLIC SERVICE VEHICLES IN THE WESTERN PART OF KENYA.

Marilyn Apella Ahonobadha

Adventist Community Development Organisation

Kisumu, Kenya.

ORCID: 0000-0003-2395-7609

ahonobadha79@gmail.com

Received: 2019-05-21 | Accepted: 2023-09-25 | Published: 2023-11-30

***Abstract*:** Bus termini are an essential component of urban transport facilities which define the beginning or end of the line for the transportation system. In the study area, students with physical disability frequently used bus termini to access educational institutions which were far removed from their residences. Various bus termini were linked by fourteen seater vehicles or buses. During such trips, the students encountered numerous design barriers due to the inappropriate layout of the public service vehicles. This study established that the following design barriers existed in public service vehicles: high entry steps, lack of grab bars at the entrance, narrow doors and narrow spaces between seats. While navigating these design barriers, the students encountered the following attitudinal barriers: inferiority, pity, hero worship, spread effect and backlash. This study concluded that students with physical disability experienced hampered mobility due to the design barriers highlighted above. In addition to this, other users of the vehicles compounded the problem by exhibiting attitudinal barriers. Therefore, this study recommends enforcing standards in the design of public service vehicles which enhance access for all. Further, there is a need for the members of the public to embrace people with disabilities and stop the ongoing attitudinal barriers.

Keywords: Public transport, design barriers, attitudinal barriers

Volume 13, Issue 2. (CC) JACCES, 2023. ISSN: 2013-7087

Introduction

In 1994, the United Nations (UN) launched 22 rules for achieving equality for people with disabilities and identified eight areas of participation that should be recognised by governments when legislating to integrate people with disabilities into society. These areas were accessibility, education, employment, income maintenance, family life, culture, recreation and religion (United Nations, 1994). Five years later, the UN recognised that the process of translating the Rules into actual policy and practice was a 'major challenge' and, in response to this, called for empirical research to be carried out into the social, economic and participatory issues affecting the lives of disabled people and their families (United Nations, 1999).

The driving force behind the UN's stand on the importance of empirical research was the need to propose approaches which could be used in translating rights into action (United Nations, 1999). Further to this call for empirical research, the UN Convention called on participating governments to ban discriminatory practices and instead promote equal access to education and healthcare, promoting equal participation in public life and personal mobility (United Nations, 2019). This convention requires state parties to take appropriate measures to ensure that disabled persons have access to the physical environment, transportation and other facilities open to the public since all human rights are universal, indivisible, interdependent and interrelated, (United Nations, 2006). In 2007, Kenya became one of the first states to sign the International Convention on the Rights of Persons with Disabilities (United Nations, 2019). By this act, the Government was stating its commitment to promote and protect the rights of persons with disability. More importantly, the country was stating its willingness to promote access of disabled people to facilities open to the public.

The existence of an enabling legal framework promoting the rights of disabled persons does not necessarily mean that issues of accessibility are translated down to society. Coulson (2003) confirms that people with disabilities living on low incomes often 'fall between the gaps'. This study intends to focus on students with physical disability since they are a marginalised group within disabled people.

Volume 13, Issue 2. (CC) JACCES, 2023. ISSN: 2013-7087

Since 2003 when the Government launched Free Primary Education, gross enrolment rate (GER) had increased to 104 per cent in 2018 (Kenya Institute for Public Analysis, 2020). Enrolment increased across all categories of students, despite physical ability. Consequently, the volume of youths with disability attending school increased in 2003 due to the advent of free primary and secondary education in Kenya (Tooley, Dixon and Stanfield, 2003).

In order to access special schools, learners with Physical disabilities (LwPD) have to make use of termini since special schools are far removed from their residence. Kenya has twelve special schools of which eight are primary schools while four are secondary schools (Handicap International 2010).

High entry steps in vehicles have been identified as a barrier to access (Venter *et al.*, 2003). To mitigate this problem, low-floor buses should be utilised since they reduce the height difference between the kerb and bus floor. Research has also established that although low-floor buses are generally seen as a means of improving accessibility for passengers with disabilities, all passengers benefit from low-floor bus services (Bus Priority Team, 2006).

In Kenya, the Draft Kenya Standard, Road Vehicles Passenger Vehicle Body Construction Specification (2018) specifies that the lowest step for entering into a vehicle shall not exceed a height of 460 mm from the ground.

Within the study area, the two main modes of transportation are the bus and minivan. The main modes have been illustrated in the plates below:

Volume 13, Issue 2. (CC) JACCES, 2023. ISSN: 2013-7087

Figure 1. Image of a Bus used for public transportation

Figure 1 shows an image of an example of a Bus used in the western part of Kenya Kwoba and Mettke (2020) explain further that the public transport system is dominated by privately-owned public service vehicles which include buses and minibuses (known as matatus). Bus capacities range from 32 to 57 seaters.

Figure 2. Image of minivan (Matatu)

Volume 13, Issue 2. (CC) JACCES, 2023. ISSN: 2013-7087

Minivans are a common mode of public transport used in Western Kenya. Kwoba and Mettke (2020) explain further that matatu capacities range from 14 to 25 seaters.

This study, therefore, examined the design of the common modes of public service vehicles and the extent to which students with physical disabilities interacted with them in a typical trip to school. Accessible entrances are beneficial to a wide number of the populace, including children, the elderly, and persons with physical disability. Therefore, this study sought to evaluate the entrances of public service vehicles which used bus termini in the western part of Kenya.

In a typical trip to school, LwPD have to use termini since these termini define the beginning or end of the trip to school. A bus terminus can be a minor or major stop. A minor terminus is a simple bus stop, while a major terminus acts as a transfer station from one vehicle to another. It becomes clear, therefore, that to access special schools which are few and also far removed from the residences of the learners have to use bus termini and public service vehicles. Depending on the residence of a given student, a school trip may entail using more than one terminus and more than one type of vehicle. This study evaluated the design of buses, fourteen seater, and seven seater vehicles- so as to ascertain the design barriers in these vehicles. The study also sought to determine whether the learners experienced attitudinal barriers as they navigated over the design barriers.

Other examples of attitudinal barriers are spread effect, when other people assume that an individual's disability negatively affects other senses, abilities or personality traits; while stereotypes are formed when non-disabled members of the society form positive or negative generalisations about people with disabilities. Lastly, backlash is manifested when people believe individuals with disabilities are given unfair advantage; while fear occurs when non-disabled people are afraid that they will "do or say the wrong thing" around someone with a disability (World Bank, 2007).

Volume 13, Issue 2. (CC) JACCES, 2023. ISSN: 2013-7087

Methodology of Work

The study area was located in the western part of Kenya. Bus termini under consideration included: Bungoma, Kisumu, Kakamega and Kendu Bay. Bungoma terminus is situated next to the Bungoma Municipal market. This terminus acted as an intersection point for students learning at Nalondo Primary, Joy Valley Kamatuni and Nalondo Secondary School. It also acted as the origin point for LwPD, who learn in special schools located in other Counties, yet resided in Bungoma. Kisumu bus terminus is located in Kisumu which is a port city in the western part of Kenya. It is the third largest city in Kenya, the principal city of western Kenya and the headquarters of Kisumu County. This terminus acted either as an endpoint for students learning at Joyland primary and Secondary schools or as an origin for students who learnt either in Kendu Bay, Kakamega or Bungoma.

Kakamega terminus is located in western Kenya and 52 km from Kisumu terminus. This terminus acted either as an end point for students who studied at Daisy school or as an intersection point for students on their way to special schools in Bungoma or Kisumu. Lastly, Kendu Bay terminus is located on the shore of Lake Victoria along Katito Homa-Bay road. This terminus is located in Kendu Bay, a bay and a town in Kenya. Kisumu terminus is located 40 kilometres north of Kendu Bay. This terminus served either as an endpoint for students learning at Nyaburi or as an origin for students who learnt at Bungoma, Kisumu or Kakamega. These bus termini served up to 1,525 LwPD at the beginning and end of every school term. 315 respondents took part in this study.

The students had to evaluate the vehicle they used before terminating their school trip at a major bus terminus. The major bus termini in the study area were: Kisumu, Kakamega, Kendu Bay, or Bungoma. The vehicle types used in these bus termini included: seven seaters, fourteen seaters or buses. Respondents were required to document the specific design barriers experienced in the vehicle before terminating the school trip. Further, the respondents pointed out specific attitudinal barriers exhibited by commuters who did not have a disability.

Volume 13, Issue 2. (CC) JACCES, 2023. ISSN: 2013-7087

Discussion of Findings

Socio demographic Profile

Assistive Devices Used by Respondents.

A total of 315 respondents took part in the study, of which 34% made use of Bungoma terminus, while 25.4% of the respondents made use of the Kisumu terminus. Respondents who utilised Kendu Bay terminus were 27%; while 13.7% used Kakamega terminus. Respondents in the study area used assistive devices to substitute- to some extent- the missing or disabled limb. These devices also helped the students to be independent since they enhanced movement from one place to another. The assistive devices used within the study area have been presented in Table 1.

Table 1. Type of Assistive Device Used in Study Area

	Bungoma	Kisumu	Kendu Bay	Kakamega	Total
None	2.2%	14.3%	16.5%	7.9%	**41.0%**
Wheelchair	27.3%	4.4%	1.6%	0.6%	**34.0%**
Walking Stick	0.0%	1.0%	0.6%	0.0%	**1.6%**
Walker	0.3%	0.0%	0.0%	0.0%	**0.3%**
Crutches	2.9%	5.4%	5.4%	3.2%	**16.8%**
Tricycle	0.0%	0.3%	0.0%	0.0%	**0.3%**
Special Boots	1.3%	0.0%	2.9%	1.9%	**6.0%**
Total	**34.0%**	**25.4%**	**27.0%**	**13.7%**	**100%**

Volume 13, Issue 2. (CC) JACCES, 2023. ISSN: 2013-7087

A presentation of the assistive devices used across the study area reveals that the level of disability among respondents varied- such that the highest percentage of respondents did not use any assistive device (41%). These respondents had neurological disorders, which significantly reduced their dexterity and stamina. From these results, it can be deduced that the schools based in Kisumu had the highest percentage (14.3%) of students with neurological disorders, while Bungoma accounted for the least number of students with neurological disorders (2.2%).

Respondents who used wheelchairs in the study area accounted for 34% of the total respondents. These results establish that the highest percentage of students with the most significant degree of disability were based in Bungoma; while Kakamega had the least number of these students (0.6%). Respondents who used walking sticks had a slight disability on the lower limbs. Respondents who used walking sticks terminated their trip at Kisumu or Kendu Bay. None of the respondents who terminated their trip in Bungoma or Kakamega used walking sticks.

The results show that the highest percentage of crutch users were based in Kisumu and Kendu Bay (5.4%, respectively); while the lowest percentage of crutch users were based in Bungoma. Respondents who used special boots had slight lower limb disability when compared to crutch users. These respondents accounted for 6.0% of the total percentage of respondents. In Bungoma, special boot users accounted for 1.3%, while in Kendu Bay, they were 2.9%. Amongst respondents who terminated their trip in Kisumu terminus, none used special boots; while the highest percentage of special boot users terminated their trip in Kendu Bay.

Age of Respondents

Respondents in the study area were between the ages of 11 years to 19 years as has been illustrated in Table 2.

Volume 13, Issue 2. (CC) JACCES, 2023. ISSN: 2013-7087

Table 2. Age of Respondents per Town Cross tabulation.

	Bungoma	Kisumu	Kendu Bay	Kakamega	Total
11 years	3.8%	0.0%	1.0%	1.6%	**6.3%**
12 years	6.7%	1.0%	2.2%	1.6%	**11.4%**
13 years	2.5%	2.9%	10.8%	6.3%	**22.5%**
14 years	6.0%	6.3%	5.1%	3.5%	**21.0%**
15 years	7.3%	6.0%	3.2%	0.6%	**17.1%**
16 years	4.4%	3.2%	3.2%	0.0%	**10.8%**
17 years	1.3%	4.1%	1.0%	0.0%	**6.3%**
18 years	0.6%	2.2%	00.0%	0.0%	**2.9%**
19 years	1.3%	0.3%	0.0%	0.0%	**1.6%**
Total	**34.0%**	**26.0%**	**26.3%**	**13.7%**	**100%**

Within the study area, the bulk of respondents were aged 13 years (22.5%, followed by the fourteen year olds (21%). The lowest percentage of respondents were 19 years and they accounted for 1.6% of the respondents. 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 primary section, respondents were drawn from class six to eight, while in secondary, respondents were drawn from form one to four.

Barriers in Vehicles

High Entry Steps in Vehicle

Table 3 presents a breakdown on the occurrence of high entry steps in vehicles.

Table 3. High Entry Steps per Type of Assistive Device Used Cross tabulation

	None	Wheelchair	Walking Stick	Walker	Crutches	Tricycle	Special Boots	Total
No Barrier	6.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	**7.6%**
Minivan	6.3%	5.1%	0.6%	0.0%	0.9%	0.0%	0.0%	**13.0%**
Bus	28.6%	27.3%	1.0%	0.3%	15.9%	0.3%	6.0%	**79.4%**
Total	**41.0%**	**34.0%**	**1.6%**	**0.3%**	**16.8%**	**0.3%**	**6.0%**	**100%**

Amongst the vehicles, the bus seemed to be a more popular means of transport when compared to the seven seater and fourteen seater. However, the entry steps in buses proved to be a barrier to most of the respondents since it accounted for slightly more than three-quarters of the responses (79.4%). High occurrence of this barrier were reported by respondents who did not use any assistive device (28.6%), wheelchair users (27.3%), crutch users (16.8%), and special boot users (6%). These results reveal that the respondents in the study area experienced much difficulty in boarding vehicles plying the routes in the study area due to the presence of high entry steps. Respondents noted that during some instances, the crew of the vehicles would assist them in alighting and boarding the vehicles.

The height of the minivan steps was 300 mm across the study area, while that of the steps of the buses were 460 mm of the ground. None of the buses had a retractable first step. Although the specified dimensions are within the proposed standards by the Kenya Bureau of Standards (2018). The researcher

noted that the step entrances in the study area do not promote ease of use of vehicle entrances.

In areas where it is not feasible to have low-floor buses, a retractable first step at a bus entrance (or a movable stool) should be provided to assist semi-ambulatory passengers, while an accessible footboard of 230mm should be provided to facilitate boarding of vehicles by non-ambulatory passengers. To prevent tripping hazards, non-skid materials should be used for step and floor surfaces (Singh, Nagdavane and Srivastva 2007).

Bhise, Bhise and Dhanuka (2022) advocate for providing low heights of first step in vehicles to enhance ease of access by people with disabilities.

Lack of Grab Bars at Entrances

Another hindrance posed by the design of vehicles was the lack of sufficient grab bars at entrances, as has been illustrated in Table 4.

Table 4. Lack of Sufficient Grab Bars at Entrances per Type of Assistive Device Used Cross tabulation

	None	Wheelchair	Walking Stick	Walker	Crutches	Tricycle	Special Boots	Total
No Barrier	4.4%	6.7%	0.6%	0.3%	1.0%	0.0%	0.0%	**12.1%**
Minivan	13.3%	22.8%	0.6%	0.0%	8.2%	0.3%	2.3%	**48.6%**
Bus	23.2%	4.4%	0.3%	0.0%	7.6%	0.0%	3.8%	**39.4%**
Total	**41.0%**	**34.0%**	**1.6%**	**0.3%**	**16.8%**	**0.3%**	**6.0%**	**100%**

Lack of sufficient grab bars was highlighted by almost half of the respondents who used the minivan, while slightly more than a third of bus users (39.4%) highlighted this problem. Wheelchair users in the minivan category reported the highest percentage compared to other assistive devices (22.2%). In the bus

category, respondents with neurological disorders reported the highest occurrence of lack of grab rails at vehicle entrance (23.2%).

Respondents revealed further that when they were allocated the front seat in the minivan, embarking the vehicle entailed a delicate balance of making use of the seat and the grab bar positioned in the dashboard next to the co-driver. During other instances, when allocated a seat behind the driver, the respondents would use the seat as a means of support to hoist themselves up. However, the bus did not have this feature, which explains why it reported the highest percentage on this barrier. Wheelchair and tricycle users also pointed out further that due to the absence of grab bars at the entrance of buses, they had to bear the indignity of being carried into the bus when they had to board. Further, these results reveal that grab bars benefit all the LwPD regardless of the assistive device used.

Bhise, Bhise and Dhanuka (2022) advocate for the provision of railing near the steps of buses to enable pwD to board easily.

Narrow Doors

Another barrier to access was presented by narrow door openings, as has been illustrated in Table 5.

Table 5. Narrow Door Opening per Type of Assistive Device Used Cross tabulation

	None	Wheelchair	Walking Stick	Walker	Crutches	Tricycle	Special Boots	Total
No Barrier	2.2%	3.8%	0.0%	0.0%	0.3%	0.0%	0.0%	**6.3%**
Minivan	18.1%	21.9%	0.6%	0.3%	7.3%	0.3%	1.2%	**49.9%**
Bus	20.6%	8.3%	1.0%	0.0%	9.2%	0.0%	4.8%	**43.8%**
Total	**41.0%**	**34.0%**	**1.6%**	**0.3%**	**16.8%**	**0.3%**	**6.0%**	**100.0%**

Amongst users of the minivan, respondents who used the wheelchair experienced the most significant difficulty (21.9%), followed by respondents with neurological disorders (18.1%). In the bus category, respondents who had neurological disorders reported the highest percentage (20.6%), followed by crutch users (9.2%), wheelchair users (8.3%) and special boot users (4.8%).

The width of the doorways of buses ranged between 650 mm and 700 mm, while that for the 14 seater minivan was 600 mm. The doorway of buses was clear of any obstacles, while that of the minivan had seat fixed within the doorway space. Getting into the minivan thereby required contortion of the body in order to squeeze between the little space left. The responses from the study area show that a significant percentage of respondents experienced difficulty manoeuvring over the doorways. Given the fact that some assistive devices are bulky and require a significant amount of space. In addition to this, LwPD need additional space to manoeuvre through the doorways of vehicles adequately.

Presence of narrow door openings in vehicles is a design barrier which hinders access by people with disability. (Venter, Savill, Rickert et al., 2002; Bhise, Bhise and Dhanuka, 2022). It is important to note at this juncture that accessible vehicle entrances benefit a wide category of people including people with young children, people with pushchairs, ambulant disabled people, people with impaired vision, wheelchair users, passengers with shopping or luggage and elderly people (Bus Priority Team, 2006).

Narrow Seat Spacing

The issue of seat spacing in vehicles is presented in Table 6.

Table 6. Narrow Space between Seats per Type of Assistive Device Used Cross tabulation

	None	Wheelchair	Walking Stick	Walker	Crutches	Tricycle	Special Boots	Total
No Barrier	2.9%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	**5.7%**

	None	Wheelchair	Walking Stick	Walker	Crutches	Tricycle	Special Boots	Total
Minivan	34.2%	38.3%	1.6%	0.0%	16.5%	0.3%	0.6 %	**88.9%**
Bus	2.9%	2.9%	0.0%	0.3%	0.3%	0.0%	0.0%	**6.3%**
Total	**41%**	**34.0%**	**1.6%**	**.3%**	**16.8%**	**.3%**	**6.0%**	**100%**

Narrow seat spaces in minivans presented a problem to the following categories of LwPD: 34.2% of respondents who did not use any assistive device, 38.3% of wheelchair users, 1.6% of walking stick users, 16.5% of crutch users and 0.6% of special boot users. Respondents who had a problem with the seat spacing in buses was such that 2.9% did not use any assistive device, 2.9% used wheel chairs, 0.3% used walkers, while 0.3% used crutches.

Narrow space between seats was evident in the gangway and also in the knee clearance between seats. The gangway measurement for the bus was 450 mm, while that of the minivan varied between 300 mm and 350 mm. Within the study area, the knee clearance for the minivan ranged between

Due to the inappropriate design of the built environment, the participation of PwD is limited. They also spend more money on private means of transportation –(Bhise, Bhise and Dhanuka, 2022).

Sources of Attitudinal Barriers

While navigating over the design barriers highlighted above, respondents noted that they were recipients of attitudinal barriers from commuters, hawkers, drivers and conductors as is evidenced in Table 7.

Volume 13, Issue 2. (CC) JACCES, 2023. ISSN: 2013-7087

Table 7. Sources of Inferiority

Terminus	Conductor No	Conductor Yes	Hawkers No	Hawkers Yes	Driver No	Driver Yes	Travellers No	Travellers Yes
Bungoma	0.9%	18.3%	16.4%	2.8%	15.1%	4.1%	0.3%	18.9%
Kisumu	0.9%	14.5%	12.6%	2.8%	11.7%	3.8%	0.3%	15.1%
Kendu Bay	5.0%	15.1%	20.2%	0.0%	5.4%	14.8%	0.9%	19.2%
Kakamega	2.2%	7.3%	9.5%	0.0%	2.2%	7.3%	0.3%	9.1%
Total	**9%**	**55.2%**	**58.7%**	**5.6%**	**34.4%**	**30%**	**1.8%**	**62.3%**

Across the study area, respondents pointed out that travellers reported the highest percentage of inferiority (62.3%) when compared to conductors (55.2%), hawkers (5.6%) or drivers (30%). Within the study area, 55.2% of the respondents confirmed that inferiority emanated from conductors, of which 18.3% were from Bungoma, 14.5% were from Kisumu, 15.1% were from Kendu Bay, while 7.3% were from Kakamega. Bungoma reported the highest percentage of inferiority from conductors (18.3%).

Inferiority occurs when non-disabled members of society believe that the presence of impairments renders disabled persons ineffective (World Bank, 2007). As highlighted, evidence of this insensitivity and rudeness was present in the study area. When making verbal their thought, the researcher got a view of their view of disability. Within the study area, some non-disabled users interpreted the presence of disability as a sign of disfavour from the gods, referring to the parents of these learners as having done something wrong to warrant having a disabled child. Sources of pity have been presented in Table 8.

Volume 13, Issue 2. (CC) JACCES, 2023. ISSN: 2013-7087

Table 8. Sources of Pity

Terminus	Conductor No	Conductor Yes	Hawkers No	Hawkers Yes	Driver No	Driver Yes	Travellers No	Travellers Yes
Bungoma	2.5%	21.5%	22.4%	1.6%	15.1%	4.1%	0.3%	18.9%
Kisumu	1.9%	17.0%	17.4%	1.6%	11.7%	3.8%	0.3%	15.1%
Kendu Bay	8.2%	17.7%	24.9%	0.9%	5.4%	14.8%	0.9%	19.2%
Kakamega	4.4%	8.5%	12.6%	0.3%	2.2%	7.3%	0.3%	9.1%
Total	**17.0%**	**64.7%**	**77.3%**	**4.4%**	**34.4%**	**30%**	**1.8%**	**62.3%**

Across the study area, respondents pointed out that conductors reported the highest percentage of pity (64.7%) when compared to hawkers (4.4%), drivers (30%) or travellers (62.3%). Within the study area, 64.7% of the respondents confirmed that pity emanated from conductors, of which 21.5% were from Bungoma, 17% were from Kisumu, 17.7% were from Kendu Bay, while 8.5% were from Kakamega. Kendu Bay reported the highest percentage of pity from conductors (17.7%).

Table 9 presents the sources of hero worship.

Table 9. Sources of Hero Worship

Terminus	Conductor No	Conductor Yes	Hawkers No	Hawkers Yes	Driver No	Driver Yes	Travellers No	Travellers Yes
Bungoma	0.9%	22.1%	21.5%	1.6%	17.7%	5.4%	0.3%	22.7%
Kisumu	0.3%	18.0%	16.4%	1.9%	12.9%	5.4%	0.3%	18.0%

Terminus	Conductor No	Conductor Yes	Hawkers No	Hawkers Yes	Driver No	Driver Yes	Travellers No	Travellers Yes
Kendu Bay	7.3%	13.9%	21.1%	0.0%	6.3%	14.8%	0.0%	21.1%
Kakamega	4.1%	5.7%	9.8%	0.0%	1.9%	7.9%	0.6%	9.1%
Total	**12.6%**	**59.7%**	**68.8%**	**3.5%**	**38.8%**	**33.5%**	**1.2%**	**70.9%**

Across the study area, respondents pointed out that travellers reported the highest percentage of hero worship (70.9%) when compared to hawkers (3.5%), drivers (33.5%) or conductors (59.7%). Within the study area, 59.7% of the respondents confirmed that hero worship emanated from conductors, of which 22.1% were from Bungoma, 18% were from Kisumu, 13.9% were from Kendu Bay, while 5.7% were from Kakamega. Bungoma reported the highest percentage of hero worship from conductors (22.1%). Respondents who noted that hero worship emanated from hawkers were 3.5%, of which 1.6% were from Bungoma, while 1.9% were from Kisumu. Kisumu reported the highest percentage of hero worship from hawkers (1.9%).

Hero worship occurs when non-disabled members of society consider someone with a disability who lives independently to be brave or "special" for overcoming a disability (Advancing Workforce Diversity, n.d.).

Another barrier experienced in the study area was spread effect. Results on this barrier have been presented in the sections following (Table 10).

Table 10. Sources of Spread Effect

Terminus	Conductor No	Conductor Yes	Hawkers No	Hawkers Yes	Driver No	Driver Yes	Travellers No	Travellers Yes
Bungoma	0.9%	11.4%	12%	0.3%	0.3%	12%	8.8%	3.5%
Kisumu	0.9%	8.5%	9.1%	0.3%	0.3%	9.1%	6.3%	3.2%

Terminus	Conductor No	Conductor Yes	Hawkers No	Hawkers Yes	Driver No	Driver Yes	Travellers No	Travellers Yes
Kendu Bay	7.6%	16.1%	23.3%	0.3%	0.6%	23%	7.9%	15.8%
Kakamega	4.4%	8.5%	12.6%	0.3%	0.6%	12.3%	2.2%	10.7%
Total	**13.8%**	**44.5%**	**57%**	**1.2%**	**1.8%**	**56.4%**	**25.2%**	**33.2%**

Across the study area, respondents pointed out that drivers reported the highest percentage of spread effect (56.4%) when compared to conductors (44.5%), hawkers (1.2%), or travellers (33.2%). Within the study area, 44.5% of the respondents confirmed that spread effect emanated from conductors, of which 11.4% were from Bungoma, 8.5% were from Kisumu, 16.1% were from Kendu Bay, while 8.5% were from Kakamega. Kendu Bay reported the highest percentage of spread effect from conductors (16.1%).

Spread effect as an attitudinal barrier occurs during instances when other people assume that an individual's disability negatively affects other senses, abilities or personality traits (Advancing Workforce Diversity, n.d.). Table 11 presents the sources of backlash in the study area.

Table 11. Sources of Backlash

Terminus	Conductor No	Conductor Yes	Hawkers No	Hawkers Yes	Driver No	Driver Yes	Travellers No	Travellers Yes
Bungoma	0.3%	14.2%	12.9%	1.6%	11.4%	3.2%	0.3%	14.2%
Kisumu	0.6%	12.0%	11.0%	1.6%	9.8%	2.8%	0.3%	12.3%
Kendu Bay	8.2%	13.6%	21.8%	0.0%	6.0%	15.8%	0.9%	20.8%
Kakamega	4.4%	5.7%	10.1%	0.0%	1.6%	8.5%	0.3%	9.8%

Terminus	Conductor No	Conductor Yes	Hawkers No	Hawkers Yes	Driver No	Driver Yes	Travellers No	Travellers Yes
Total	**13.5%**	**45.5%**	**55.8%**	**3.2%**	**28.8%**	**30.3%**	**1.8%**	**57.1%**

Across the study area, respondents pointed out that travellers reported the highest percentage of backlash (57.1%) when compared to conductors (45.5%), hawkers (3.2%) or drivers (30.3%). Within the study area, 45.5% of the respondents confirmed that backlash emanated from conductors, of which 14.2% were from Bungoma, 12% were from Kisumu, 13.6% were from Kendu Bay, while 5.7% were from Kakamega. Kisumu reported the highest percentage of backlash from conductors (11.7%). Respondents who noted that backlash emanated from hawkers were 3.2% of which 1.6% were from Bungoma, while 1.6% were from Kisumu.

Respondents who noted that backlash emanated from drivers were 30.3% of which 3.2% were from Bungoma, 2.8% were from Kisumu, 15.8% were from Kendu Bay, while 8.5% were from Kakamega. Kendu Bay reported the highest percentage of backlash from drivers (15.8%). Respondents who confirmed that backlash emanated from travellers were 57.1% of which 14.2% were from Bungoma, 12.3% were from Kisumu, 20.8% were from Kendu Bay, while 9.8% were from Kakamega. Kendu Bay reported the highest percentage of backlash from travellers (20.8%). Backlash exists when people believe individuals with disabilities are given an unfair advantage (Advancing Workforce Diversity, n.d.).

Across the study area, various attitudinal barriers existed. Freer (2021) brings to fore the fact that Students' with disabilities continue to face attitudinal barriers. Ambati (2017) suggests that there is a need for changes to be made, not only in the physical environment but also in the attitudes of people interacting with people with disabilities. This particular research was done in an educational set up, but the recommendations are valid as far as the design of public spaces is concerned. Goodall, Mjoen, Witso et al. (2022) have confirmed that many students with disabilities have experienced some form of stigma. The researchers also advocate for more awareness and understanding towards disability.

Conclusion

The presence of design and attitudinal barriers continues to perpetuate ongoing discrimination against PwD. Reversing the ongoing discrimination will stem from needed redesign of public service vehicles so as to ensure that they enhance access. In addition to this, there is the need to educate the public so as to help deal with the attitudinal barriers present in the study area.

Acknowledgments

Special thanks to Mistra Urban Futures and Kisumu Local Interaction Platform for the partial funding which financed part of the research work.

References

[1] Advancing Workforce Diversity (n.d.) Attitudinal Awareness. Employer Assistance and Resource Network on Disability Inclusion https://askearn.org/page/attitudinal-awareness

[2] Ambati, N. (2017). Attitudinal Barriers Encountered by Students with Disabilities in Higher Education Institutions. The International Journal of Indian Psychology Volume 04, Issue 4, July-September, 2017. https://doi.org/10.25215/0404.050

[3] Bhise, Swati & Bhise, Avinash & Dhanuka, Harsha. (2022). "the Environmental and Architectural Barrier for Semi Ambulatory Disabled Person". Indian Journal of Scientific Research. 6. 109-113.

[4] Bus Priority Team technical advice note BP1/06 (2006). Accessible bus stop design guidance: Author. Retrieved from https://nacto.org/wp-content/uploads/2016/02/TfL-accessibile-bus-stop-design-guidance.pdf on 5th April, 2012.

[5] Copestake, P., Sheikh, S., Johnston, S. & Bollen, A. 2014. Removing barriers, raising disabled people's living standards. IPSOS. Retrieved from https://silo.tips/queue/removing-barriers-raising-disabled-people-s-living-standards on 26th March, 2014.

[6] Coulson, J. (2003). Enabled environments reducing barriers for low-income people with disabilities in South Africa. The Global Urban Research Unit

(GURU) 1 DFID Research Project No. R7653: Department for International Development (DFID): UK.

[7] Freer, J. R. R. (2021). The Tripartite Intervention: Breaking Down Attitudinal Barriers in Education. Journal of Disability Studies in Education, 2(1), 50-76. https://doi.org/10.1163/25888803-bja10006

[8] Goodall, G., Mjoen, O., Witso, A., Horghagen, S. and Kvam, L. (2022). Barriers and Facilitators in the Transition From Higher Education to Employment for Students With Disabilities: A Rapid Systematic Review. Front. Educ. 7:882066. https://doi.org/10.3389/feduc.2022.882066

[9] Handicap International (2010). Kenya Disability Directory. Handicap International. Retrieved on 22nd April, 2016 from http://www.afri-can.org/directory/Kenya%20Disability%20Directory%20-%202010.pdf

[10] Kenya Bureau of Standard (2018). Public REview Standards. Retrieved from https://www.kebs.org/images/standards/public_review_standards/DKS-372_2018_PUBLIC-REVIEW-DRAFT.pdf on 21st October, 2022

[11] Kenya Institute for Public Analysis (2020). Achieving 100 per cent Transition from Primary to Secondary School: Status, Challenges and Opportunities for Sustainability. Retrieved from https://kippra.or.ke/achieving-100-per-cent-transition-from-primary-to-secondary-school-status-challenges-and-opportunities-for-sustainability/ on 17th October, 2022

[12] Kwoba, H. and Mettke, C. (2020). Digitalisation in Kenya's Road transport sector: Ride hailing and influences of other digital applications in Kenya's mobility https://www.changing-transport.org/wp-content/uploads/2020_Digitalisation_Kenya_Road_transport_sector.pdf

[13] Mugo, J., Oranga, J. & Singal, N. (2010). Testing youth transitions in Kenya. Are young people with disabilities falling through the cracks? Department for International Development. Research Consortium on Educational Outcomes and Poverty. Working Paper Number 34.

[14] Singh, M., Nagdavane, N., & Srivastva, N. (2007). Public transportation for elderly and disabled. Paper delivered at the TRANSED Conference. Montreal: Canada. Retrieved from https://trid.trb.org/view/890451on 6th February, 2012.

[15] Tooley, J., Dixon, P., & Stanfield, J. (2008). Impact of Free Primary Education in Kenya: A Case Study of Private Schools in Kibera. Educational Management Administration & Leadership, 36(4), 449-469. https://doi.org/10.1177/1741143208095788

[16] United Nations(2019) UN Committee to review Kenya's record on Children's rights. United Nations. https://www.ohchr.org/en/press-releases/2016/01/un-committee-review-kenyas-record-childrens-rights

[17] United Nations (1999). Towards a society for all: Long-term strategy to implement the world programme of action concerning disabled persons to the year 2000 and beyond. New York: United Nations.

[18] United Nations. (1994). The standard rules on the equalization of opportunities for persons with disabilities. New York: United Nations.

[19] United Nations. (2006). Convention on the Rights of Persons with Disabilities. New York: United Nations. Retrieved 20th October, 2012 from https://social.desa.un.org/issues/disability/crpd/convention-on-the-rights-of-persons-with-disabilities-crpd

[20] Venter, C., Rickert, T., & Maunder, D. (2003).From Basic Rights to full access: Elements of Current Accessibility Prctices in Developing Countries. Department for International Development. Disability, Poverty and Development. UK: London

[21] Venter, C., Savill, T., Rickert, T., Bogopane, H., Venkatesh, A. Camba, J., Mulikita, J., Khaula, C., Stone, J. & Maunder, D. (2002). Enhanced accessibility for people with disabilities living in urban areas. PR/INT/248/02. Engineering Knowledge and Research: Project R8016. London: Retrieved from https://ecommons.cornell.edu/items/80f3b176-7dc4-4491-af37-b1b710d50213 on 31st January, 2012

[22] World Bank (2007). People with disabilities in India: from commitments to outcomes. World Bank, Human Development Unit, South Asia Region. https://hpod.law.harvard.edu/pdf/PeoplewithDisinIndia.pdf

Volume 13, Issue 2. (CC) JACCES, 2023. ISSN: 2013-7087

How to cite this article:

Ahonobadha, M. A.(2023). Accessibility of students with physical disability to public service vehicles in the western part of Kenya. Journal of Accessibility and Design for All, 13(2), 140-161.
https://doi.org/10.17411/jacces.v13i2.229

The Journal of Accessibility and Design for All, ISSN 2013-7087, is published by the Universitat Politècnica de Catalunya, Barcelona Tech, with the sponsoring of Fundación ONCE. This issue is free of charge and is available in electronic format.

JACCES is committed to providing accessible publication to all, regardless of technology or ability. The present document grants strong accessibility since it applies to WCAG 2.0 and accessible PDF recommendations. The evaluation tool used has been Adobe Acrobat® Accessibility Checker. If you encounter problems accessing the content of this document, you can contact us at jacces@catac.upc.edu.