



**REHABILITEES WITH VISUAL IMPAIRMENTS'  
CANE SKILLS AND THEIR INFLUENCE ON INDEPENDENT  
TRAVEL IN NAIROBI CITY COUNTY, KENYA**

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**Abstract:**

The purpose of this study was to determine the influence of rehabilitees with visual impairment cane skills on their independent travel. The study was based on Bandura's social cognitive learning theory. The researcher used a case study research design. The study was carried out at Kenya Institute for the Blind located in Nairobi County, Kenya. The target population was two orientation and mobility trainers and fifty rehabilitees with visual impairment who lost sight between the years 2011 and 2016 and who underwent rehabilitation at KIB. A purposive sampling technique was used to select KIB for the study. Snowball sampling technique was used to locate thirty-seven rehabilitees with visual impairment. Data was collected using questionnaires. The pilot study was conducted at Machakos Technical Institute for the Blind because of its similar characteristics in the admission of rehabilitees with visual impairment. The researcher ensured the content validity of the research instruments through discussion with supervisors and lecturers in the Department of early childhood and Special Needs Education. Quantitative data was gathered using questionnaires and processed using Statistical Package for Social Sciences (SPSS) program. Data was analysed using

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descriptive statistics and presented using tables. The findings revealed that mobility canes were the main device used at Kenya Institute for the Blind for orientation and mobility. Worldwide, canes were the most used device for orientation and mobility for individuals with visual impairment. In KIB, the device was limited in supply and not readily available. Cane skills were the most popular orientation and mobility techniques among rehabilitees in KIB. The study concluded that rehabilitees were not adequately trained since a substantial period of time has elapsed yet they have not indicated favourable independent travel to their places of work. Orientation and mobility training at KIB led to the acquisition of necessary skills relevant to independent travel of individuals with visual impairment. The study recommended that there is a need for Kenya Government to facilitate the production of cheap locally made long canes suitable for our Kenyan roads.

**Keywords:** orientation, visual impairments, orientation and mobility

## 1. Introduction and Background

Orientation refers to the ability to know where you are and where you want to go while mobility refers to the ability to move safely, efficiently, and effectively from one desired place to another. Orientation and mobility training teaches a person with visual impairment to move independently and confidently in society by utilizing certain skills and fully making use of other senses along with the help of mobility practices and devices (Cuturi *et al.*, 2016). People with visual impairment have used canes, sticks, staffs, and bamboo poles for travel purposes throughout history. References to people with visual impairment using such devices can be found in writings of the ancient Hebrews, Greeks, and Chinese (ACVREP, 2015). Despite this, the cane was not adopted for widespread use until it was introduced in the United States at the end of World War II and has since spread throughout the entire world although unevenly (Wiener *et al.*, 2010). Orientation and mobility instruction was initially developed in the United States and adopted in the United Kingdom, Western Europe, Northern Europe, Canada, and the rest of America. These practices soon spread to Australia, New Zealand, Japan, and South Africa where they were adopted on a large scale.

In the United States, orientation and mobility were first initiated in the 1940s after the start of World War II, following the blinding of soldiers during the war. The soldiers were admitted at Valley Forge Hospital where the long cane idea created by Richard Hoover was utilized. It was at this point that orientation and mobility were realized (Tataka, 2018). However, it wasn't until the 1960s that institutions of higher learning started training programs for orientation and mobility specialists. Boston College was the first institution to offer University training to orientation and mobility specialists followed by Michigan University in 1961 (Welsh & Blasch, 2010). In the United Kingdom, the practices used in teaching mobility in Great Britain and United States were first compared. The system that was being used at Hines Veterans Administration (VA)

Hospital was viewed favorably and a recommendation was made to have a blind individual from England sent to Hines and Western Michigan University for training with the sole purpose of subjecting the individual to the “American training methods” for further evaluation of the procedures (Blasch, 2010).

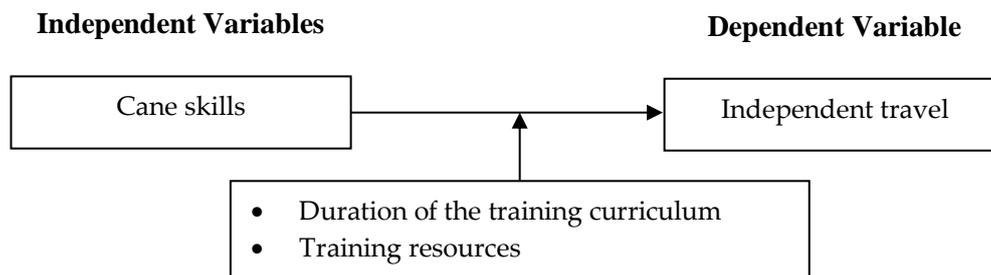
In Africa, advanced countries like South Africa already have orientation and mobility training at institutions of higher learning while other African states like Kenya are now slowly buying into the idea that university education may be a necessary part of instructor preparation just as in other professions (Mukanziza, 2019). South Africa was the first country to adopt orientation and mobility training on a large scale. In Kenya, Orientation and mobility can be traced back to the year 1974 when Christoffel Blinden Mission (CBM) started a program in conjunction with the Ministry of Education to train teachers in schools for the visually impaired. This was aimed at the trained teachers to teach orientation and mobility in their respective schools or institutions. This effort was not successful since it was met with challenges like a lack of an orientation and mobility curriculum, and a lack of appropriate follow-up programs among others (Mukanziza, 2019).

In 1986, the Kenya Institute for Special Education was mandated to train orientation and mobility specialists to provide personnel to conduct the instruction of orientation and mobility aptitudes (Tataka, 2018). The Kenya Constitution 2010 and the Persons with Disabilities Act, 2003 in comprehensively cover rights, rehabilitation, and equal opportunities for people with disabilities. This in turn gave rise to organizations and institutions offering rehabilitation services to persons with disabilities. Despite this, Kenya still lacks a proper professional governing body to certify professionals in this area of work. Loss of sight hinders a person from performing routine tasks in his/her day-to-day life. One such problem is the inability to move smoothly and independently from one place to another (Malik, *et al.*, 2018). For example, during travel majority of environmental information is received through the visual system. Hence, if there is a loss of vision, participation in social and physical activities is hampered and negatively influences a person’s mobility and quality of life (Balleman *et al.*, 2010).

### **1.1 Purpose of the Study**

The purpose of this study was to determine the influence of rehabilitees with visual impairments’ cane skills on their independent travel.

## 2. Conceptual Framework



**Figure 1:** Conceptual Framework

## 2. Literature Review

This section discusses the theoretical framework and the literature related to the study topic.

### 2.1 Theoretical Framework

This study was based on Social Cognitive Learning Theory by Albert Bandura (1986) which explains that the learning process is the result of one's observation of the surrounding behavior. The three elements are interrelated in the development of social skills and individual behavior. The theory emphasizes on the process of learning behavior through observation. Without visual ability, persons with visual impairment were at a disadvantage for they could not learn through observation. They therefore could learn through cognition as proposed by Bandura (1986). Cognitive learning requires cognition activity as an individual with visual impairment cannot depend on observation to gather information from the environment. The theory's view that personal behavioral and environmental factors mutually influence one another is evident in orientation and mobility training. The social cognitive learning theory is therefore important in the study since it acknowledges that effective acquisition of orientation and mobility skills can depend on cognitive visualization of the environment. The theory helps us view orientation and mobility as training beyond the use of the white cane and further on a continuous rationalization by the traveler with visual impairment who puts into use other senses as well as the knowhow of interacting with other people in the course of their movement (Salleh & Zainal, 2018).

### 2.2 Influence of Cane Skills on Independent Travel

The long cane/white cane is the most frequently used device for people with visual impairment who travel by themselves. Bozeman and McCulley (2010) identified different types of long canes. It may be one piece or collapsed into a small section or several. The collapsible white canes were more advantageous than the one piece because they could be folded and therefore, they are easy to transport. The length of the canes is determined by the individual's height. The canes are usually white or metallic in colour with a red

tip. The amount of red showing on a cane or the colour of the handle has nothing to do with the skill nor have anything to do with the amount of vision of its user (Attia & Asamoah, 2020). Mobility training with the help of a cane is still believed to be a great companion for a visually impaired person. It can help a person with blindness find surfaces of different textures and thus he can use certain clues and landmarks while using a cane for his independent travel (Bhagotra *et al.*, 2008). When used with proper training, the long/white cane can be an effective and efficient device that facilitates safe and independent travel by people with visual impairment. The long cane is reliable, long-lasting, and highly maneuverable and allows investigation of the environment without being in actual contact with it (Wiener *et al.*, 2010). However, the long cane does not provide 100 percent protection from all obstacles on the path travelled. It provides very little information within a limited distance yet it is highly visible advertising the user's disability (Jin *et al.*, 2010).

Proper use of the long/white cane is another issue. The majority of people in developing countries like Kenya rely on sighted guides and is very common to see a sighted individual holding one end of a stick and a person with visual impairment holding the other end as they move about. This is largely due to the social structure of the extended family which guarantees that there are many relatives ready to act as sighted guides even without proper training on how sighted guides are supposed to guide people with visual impairment (Mukanziza, 2019). Other than a stick being used instead of a long/white cane, it is very common to see wooden rods and bamboo sticks being used. Further, some individuals with visual impairment have learned to use their feet to feel their way around the environment. This often results in falling, brushing the sheen of their legs which in turn impinges on an individual's confidence and desire to go on independent travel (Mukanziza, 2019).

### **3. Methodology**

#### **3.1 Research Design and Target Population**

This study adopted a case study research design to investigate the influence of orientation and mobility training on independent travel of rehabilitees with visual impairment from Kenya Institute for the Blind. This is because in most cases, a case study research design selects a small geographical area of a very limited number of individuals as the subject of the study (Musango, 2019). All the thirty-seven rehabilitees with visual impairment rehabilitated at Kenya Institute for the Blind were given a questionnaire each (on level of mobility difficulty which was used to gauge the difficulty they encountered in employing cane skills and sighted guide skills learned).

#### **3.3 Sampling Techniques and Sample Size**

Kenya Institute for the Blind was purposively sampled mainly because of its location. The two orientation and mobility trainers were purposively selected because there were only two orientation and mobility trainers. Snowball sampling was used to select thirty-

seven rehabilitees from the target population of fifty rehabilitees. The thirty-seven rehabilitees with visual impairment were the only adults who were employed when they lost their sight and the researcher wanted to find out how they adjusted back to their places of work after rehabilitation. The sample size for the study comprised two orientation and mobility trainers (one male and one female) and thirty-seven rehabilitees (twenty-one male and sixteen female) with visual impairment making a total of thirty-nine respondents.

### **3.2 Research Instruments and Data Collection**

The research instruments for the study were questionnaires. The first questionnaire was used to collect information on the skill level of orientation and mobility trainers at Kenya Institute for the Blind. The second questionnaire was that of rehabilitees with visual impairment which was adapted from Difficulty with Mobility Questionnaire (DMQ-23) developed by LaGrow *et al.* (2011). The researcher first sought demographic data of the rehabilitees who had completed the training between the years 2011 to 2016 from Kenya Institute for the Blind. The researcher then administered the first questionnaires to the orientation and mobility trainers and with the help of a trained research assistant administered the second questionnaires to rehabilitees with visual impairments. Data from the instruments was picked on the same day they were administered.

### **3.3 Pilot Study**

Before carrying out the study, the researcher conducted a pilot study or a pre-test at Machakos Technical Institute for the Blind (MTIB). A pilot study was carried out in MTIB because of its similar characteristics to KIB in admitting rehabilitees with visual impairment. To ensure the content validity of the research instruments, the researcher discussed the content of the research instruments with her supervisors and lecturers in the Department of Early Childhood and Special Needs Education of Kenyatta University and peers versed in the area under study. The reliability of the research instruments was established using test-retest method. Pearson's Product Moment Correlation was used to correlate results from the two sets of research instruments. The correlation between the first and the second administrations of the trainers' questionnaires were calculated. Likewise, the first and the second administrations of the rehabilitees' questionnaires were calculated.

### **3.4 Data Analysis**

Data collected was analysed using both quantitative and qualitative methods. Quantitative data was gathered through close-ended questions while qualitative data was gathered using open-ended questions. Quantitative data gathered using a questionnaire was first coded manually. The codes were then keyed into the computer and processed using Statistical Package for Social Sciences (SPSS) 2020 version program. This resulted in descriptive statistics which was presented through frequency tables, graphs, charts, and percentages. This mode of presentation was chosen because it easily

communicated the findings to the majority of the readers (Gay, 1976). From the frequency tables, graphs, charts and percentages major findings from the study were discussed. The researcher then gave suggestions and recommendations based on the findings.

## 4. Results and Discussions

### 4.1 Demographic Information

In this section, the researcher presents demographic data collected from thirty-seven rehabilitees with visual impairment (twenty-one of whom were male and sixteen were female) and two orientation and mobility trainers (one female and one male).

**Table 1:** Demographic Data of Rehabilitees with Visual Impairment

Gender		Type of Impairment		Level of Education			Type of Work		Year of Graduation				
M	F	LV	Blind	Cert	Dip	Degree	Office	Field	2012	2013	2014	2015	2016
21	16	-	37	6	20	11	30	7	3	9	5	6	14
37		37		37			37		37				

Table 1 above revealed that there were thirty-seven respondents of which twenty-one were male and sixteen were female. All the thirty-seven respondents were blind. In their academic achievement, twenty respondents were diploma holders, eleven were degree holders and six respondents had a certificate. Thirty respondents were office workers while seven were field workers. By office workers, the researcher means their work did not involve moving from one location to another but could be accomplished in one location while fieldwork involved moving from one location to another to accomplish tasks given. Majority, (14) of the respondents had been rehabilitated in the year 2016, (9) in the year 2013, (6) in the year 2015, (5) in the year 2014, and (3) in the year 2012. The trend in numbers indicated that the institution was gaining popularity in orientation and mobility.

**Table 2:** Demographic Data of Orientation and Mobility Trainers

Reference	Age	Gender	Professional Qualification	Training Experience
01	30 – 45 years	Female	Certificate in braille competence and learning support skills which incorporates orientation and mobility	10 – 15 years
02	56 – 60 years	Male	Degree in Special Needs Education and a diploma in special education where a unit was taught in orientation and mobility	Above 20 years

Table 2 above shows two respondents one male and the other female. The female respondent is between the ages of 30 – 45 years while the male respondent is between the years of 56 – 60 years. The female respondent has a professional qualification of a certificate holder in braille competence and learning support skills which incorporates

orientation and mobility while the male respondent has a professional qualification of a degree in special needs education and also had a diploma in special education whereby a unit of orientation and mobility was taught. The female respondent had training experience of 10 – 15 years while the male respondent had training experience of above 20 years.

#### 4.2 Influence of Cane Skills by Rehabilitates with Visual Impairment on their Independent Travel

To achieve this objective, the respondents indicated the level of mobility difficulty they encountered in their effort to perform the given tasks on a five-point Likert's scale items (1 – none at all, 2 – a little, 3 – a moderate amount, 4 – a great deal and 5 – an extreme amount).

**Table 3:** Influence of Cane Skills by Rehabilitates with Visual Impairment on their Independent Travel

How much difficulty would you have to complete the following tasks?	None at all	A little	A moderate amount	A great deal	An extreme amount
	%	%	%	%	%
Avoiding obstacles in your path of travel using a cane.	0	19	68	13	0
Walking along streets with a cane.	3	11	70	16	0
Crossing quiet streets with a cane.	0	8	32	60	0
Crossing busy streets with a cane.	0	3	24	65	8
Identifying drop-offs (curbs/steps) using a cane.	0	3	30	62	5
Negotiating curbs using a cane.	0	11	35	49	5
Negotiating stairs using a cane.	24	35	33	8	0
Getting around in your home and garden using a cane.	3	43	49	5	0
Getting around immediate neighbourhood using a cane.	3	38	51	8	0
Getting around office buildings/schools/hospitals using a cane.	0	41	51	8	0

**Source:** Researcher, 2021.

Table 3 above shows that in avoiding obstacles in your path of travel using a cane, 68% of the rehabilitates had a moderate amount of difficulty, 19% of the rehabilitates had a little difficulty accomplishing the task and 13% of the rehabilitates had a great deal of difficulty. In walking along streets with a cane, 70% of the rehabilitates had a moderate amount of

difficulty, 16% had a great deal of difficulty while only 11% had a little difficulty and 3% of the rehabilitees had no difficulty at all. In crossing quiet streets with a cane, 60% of the rehabilitees had a great deal of difficulty, 32% had a moderate amount of difficulty and only 8% had a little difficulty. In crossing busy streets with a cane, 65% of the rehabilitees had a great deal of difficulty, 24% of the rehabilitees had a moderate amount of difficulty, 8% had an extreme amount of difficulty and 3% of the rehabilitee had little difficulty.

In identifying drop-offs (curb/steps), 62% of the rehabilitees had a great deal of difficulty, 30% had a moderate amount of difficulty, 5% had an extreme amount of difficulty and 3% of rehabilitee had a little difficulty. In negotiating curbs using a cane, 49% of the rehabilitees had a little difficulty, 35% had a moderate amount of difficulty, 11% had no difficulty at all, and 5% of the rehabilitees had a great deal of difficulty. In negotiating stairs using a cane, 35% of the rehabilitees had a little difficulty, 33% had moderate difficulty, 24% had no difficulty and 8% had a great deal of difficulty. In getting around home and garden, 49% of the rehabilitees had a moderate amount of difficulty 43% had a little difficulty, 5% had a great deal of difficulty and 3% rehabilitee had no difficulty at all. According to Welsh & Blasch (2010), despite being the most common mobility device used by persons with visual impairment, it has limitations especially when it comes to ensuring protection of the upper part of the body.

In getting around the immediate neighborhood using a cane, 51% of the rehabilitees had a moderate amount of difficulty, 38% had a little difficulty, 8% had a great deal of difficulty and 3% had no difficulty at all. Lastly in getting around office buildings, schools, hospitals, 51% of the rehabilitees had a moderate amount of difficulty 41% had a little difficulty, and 8% of the rehabilitees had a great deal of difficulty. In addition, the cane was the only orientation and mobility device used in KIB. The cane was imported and was not made with specification for the individual using it. Since the canes are imported they are not readily available hence if an individual needs replacement because he/she lost the one he/she had or the cane he/she had had become old he/she had to wait for at least one month. Another issue raised by the respondents was that the cane was too expensive and they had to really sacrifice to purchase one.

The findings implied that when used with proper training, the long/white cane can be an effective and efficient device that facilitates safe and independent travel by people with visual impairment. This finding is supported by those of Wiener *et al.* (2010) who revealed that a long cane is reliable, long-lasting, and highly manoeuvrable and allows investigation of the environment without being in actual contact with it. However, the long cane does not provide 100 percent protection from all obstacles on the path travelled. According to Jin *et al.* (2010), a cane provides very little information within a limited distance yet it is highly visible advertising the user's disability.

## 5. Conclusions

This study concluded that cane skills were the most popular orientation and mobility techniques among rehabilitees in KIB. The cane not only served as a technique for

traveling but it was also an identity for rehabilitees with visual impairment. Some rehabilitees confessed that it had become part and parcel of their life and they felt naked without it. Other rehabilitees expressed their concern that it depicted them in the wrong light as it advertised their blindness and they therefore did not feel comfortable carrying it everywhere they went. The fact that it was not readily available and could take months for one to be purchased for use also raised concern. The rehabilitees were not adequately trained since a substantial period of time has elapsed yet they have not indicated favourable independent travel to their places of work. Orientation and mobility training at KIB led to the acquisition of necessary skills relevant to independent travel of individuals with visual impairment.

## **6. Recommendations**

The study recommended that there is a need for Kenya Government to facilitate the production of cheap locally made long canes suitable for our Kenyan roads. There should be a professional body like ACVREP to certify professionally trained orientation and mobility specialists or trainers in Kenya to increase professionalism in this sector. Homes too should be constructed with people with difficulty in mobility in mind example those in wheelchairs and those who rely on canes to travel this will easy indoor mobility. Factors hindering effective use of cane skills by adults with adventitious visual impairment after rehabilitation in Kenya.

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## **Conflict of Interest Statement**

The authors declare no conflicts of interest.

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