

**THE ASSESSMENT OF HEARING AID TO LEARNERS WITH  
HEARING IMPAIRMENT IN MAO PRIMARY SCHOOL  
KISUMU EAST DISTRICT  
KENYA.**

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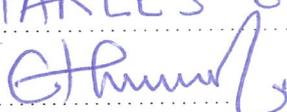
**A RESEARCH REPORT SUBMITTED IN PARTIAL  
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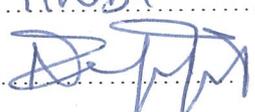
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## DECLARATION

I **CHARLES GONY REG NO: BED/9040/51/DF** hereby declare that this research report is my own original work and not a duplicate similarly published work of any scholar for academic purpose as partial requirement of any university or otherwise. It has never therefore been submitted to any other institution of higher learning for a reward of a certificate, diploma or degree in Special Needs Education. I further declare that all materials cited in this research paper which are not my own have been duly acknowledged

Name **CHARLES GONY** Date **15/8/08**  
Signature 

This research report has been submitted for examination with my approval as the candidate's university supervisor

Supervisor **TINDI SGOOS** Date **15<sup>TH</sup> August 2008**  
Signature 

## DEDICATION

This study paper is dedicated to my dear wife Florence and our daughter Lencer for their patience and love they showed during the time I was writing this paper. Their prayers, understanding and moral support was a great inspiration. Which have enabled me to accomplish this paper successfully.

## ACKNOWLEDGEMENT

My sincere and heartfelt gratitude goes to those who have been instrumental in undertaking this task. I would first and foremost express my gratitude to my supervisor Mr. Tindi Seje, whom despite being very busy in the University duties, had time to go through my work and give me the necessary guidance and advise during the writing of this paper. I would also wish to thank my colleague Mr. Benard Ohola for fruitful discussions and encouragements we had together. Above all I would like to thank the almighty God for according me good health and strength at the time of writing this study.

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## ABSTRACT

The study aims at assessing the hearing aid to learners with hearing impairment in Nairobi Kenya. The researcher applied survey method that involved qualitative and quantitative approaches of collecting raw data. Thirty questionnaires were sent to thirty respondents who completed and returned all of them to the researcher. The respondents were randomly sampled. Frequency tables, bar graph and pie chart were used to assemble and analyze the raw data in percentages.

The data analysis explains hearing aid to learners with hearing impairment, case: provision and barriers to effective use of hearing aids in Nairobi Kenya. The research findings are that the major barriers to effective provision and use of hearing aids are unaffordable, lack of adequate training and maintenance and lack of adequate information of where and how to get fitted with a hearing aid. Therefore, there is need for the government and all the stakeholders to alleviate the issue of hearing aid to learners with hearing impairment in Nairobi Kenya

# CHAPTER: ONE

## INTRODUCTION

### 1.1 Background of the study

The earliest and most natural hearing aids used by man were a cupped hand. This was later followed by an ear trumpet. However these did not render a lot of assistance to person with hearing impairment. A breakthrough in technology has lead to evolution of hearing aids from their archaic forms to ultramodern state of the art devices with very minimal shortcoming. This research is based on provision and use of electro acoustic, digital hearing aids and any other modern devices used to enhance hearing. The researcher also based the study on a strong opinion that any learner who can benefit albeit slightly from the use of a hearing aid should as well be provided with it. This stems from the appreciation of benefit of sense of hearing and its attached but very crucial benefit, which is a question of speech.

Two factors so evoked the enthusiasm to research along this line. First of all there is the introduction into the market of accessible but marvelous hearing devices. Comprehension of speech in due course will ultimately lead to speech production. These two are the basis of communication, which is a prerequisite to learning.

### 1.2 Statement of the problem

Most learners with hearing impairment have not been provided with hearing aids. The lucky ones who have managed to get them are not in a position to use them adequately.

This sad state of affair is prevalent in the researchers target population which comprises learners with hearing impairment in Nairobi Hearing impaired schools.

The problem is what are the barriers that bring about inadequate use and provision of these hearing aids?

### **1.3 Purpose of the study**

The study is aimed at investigating the barriers that negatively contribute to inadequate supply and use of hearing aids to learners with hearing impairment in Nairobi province. Subsequently the researcher wishes to find out how this situation can be reversed for the benefit of the learners.

### **1.4 Objectives of study**

The researcher aims at:

1. Determine categories of learners with hearing impairments in the sample population.
2. Establish factors that hinder adequate supply of the hearing aids to learners with hearing impairment.
3. Finding out reasons that prevent adequate use of hearing aids.
4. Finding out what can be done to make use and provision of hearing aids effective.

### **1.5 Research questions**

- i. What categories of learners with hearing impairment do you have in your school?
- ii. What hinders adequate provision of hearing aids?

- iii. What hinders adequate use of the hearing aids?
- iv. How can the use and provision of aids be made effective?

## **1.6 Significance of the study**

Acquisition and effective use of hearing aids helps comprehension and extension production of speech. In view of this, this study is carried out to solely identify barriers that contribute to the unsatisfactory provision and use of hearing aids to learners with hearing impairment in Nairobi.

Subsequently the findings of this study will be beneficial to the respondent learners other teachers and the deaf fraternity in a number of ways. To begin with the study endeavors to change the teachers and learners attitude towards the use of hearing aids by acknowledging the role of hearing aids in supporting learning, they will support their provision and use. The study also attempts to sensitize the stakeholders of special needs education none governmental organizations and churches on the part they can play in assisting learners with hearing impairment acquire and use the hearing aids appropriately.

## **1.7 Scope of the study**

The study targets the learners with hearing impairment and the suppliers of the same in Nairobi province in Kenya. Contextually the study covered the categories of learners with hearing impairments, Establish factors that hinder adequate supply of the aids to with hearing impairments, Finding out reasons that prevent use of hearing aids, Finding out what can be done to make use and provision of hearing aids effective.

## CHAPTER: TWO

### LITERATURE REVIEW

#### 2.0 Introduction

Technological advancement has communication with hearing aids easier. The explosion in technology can be observed in use of computers, television, telephone and hearing aids to pass information to the deaf. The latter is the most commonly used and the most accessible. In view of this, the researcher concedes with Kaufman and Hallahan's (1991) view that on effective teachers of learners with hearing impairment should learn as much as possible about the functioning of different kinds of hearing aids so as to assist promote their use.

However it should be state right from onset that the researcher does not advocate the use of hearing aids in isolation. Contrary to this, appreciation should go to the benefits exhibited by total communication (T.C.) in teaching, learning and general communication in T.C. there is simultaneous use of speech, lip reading, sign language and amplification. Amplification which involves use of hearing aids can support the other models of total communication in this chapter. The researcher gives a highlight on what others say about.

- Hearing impairment
- Causes of hearing impairment.
- Categories of hearing impairment
- Hearing aids

Since the use and provision of hearing aids is the researcher's area of concern. This is covered more comprehensively in terms of: Definitions of hearing aids, Components of a hearing aid, How a hearing aid works, Qualities of a good hearing aid. and Types of hearing aids Taking care of a hearing aids

## 2.1. Theoretical framework

According to Ndurumo (1993) hearing impairment comprises hearing disabilities ranging in severity from mild to profound. This embraces the hard of hearing and the deaf. Ndurumo further states that the term hard of hearing includes both those with mild hearing loss and moderate. In intensity he categorizes this between 26 - 70 DB loss are individuals exhibiting severe to profound hearing loss ranging between 71 and 91 DB hearing loss. From a study conducted by Ndurumo in 1983 cited in Ndurumo (1993) the major causes of hearing impairment can be discussed in two distinct classifications, Prenatal and Postnatal

**Prenatal Causes.** These are factors that cause hearing loss before birth. Ndurumo observed the following as the most significant.

Heredity, Meyen (1978) ranks highly the Occurrence of deafness in family with deafness history. Pregnancy Complications example of this noted Meyen, (1978) is maternal bleeding especially during the first trimester. Medication during Pregnancy the most notable are those in Mycin or Quinine group Meyen (1978).

Rhesus Incompatibility .This happens especially if the foetus is rhesus negative and mother rhesus positive. Material Rubella, Meyen (1978) ranked this first among viral infections Trauma, This involves physical injury or shock to the foetus. Other unknown causes

### **Post natal Causes**

These are conditions that bring about deafness after birth or are acquired. Ndurumo 1993 identifies the following

Childhood Measles, on this Meyén (1978) says that deafness here is caused by damage to the inner ear resulting from direct infiltration of the internal meatus.

Meningitis, this involves inflammation of meninges (protective covering of the brain), Meyen (1978)

Fever, Unlike Ndürumo (1993) Meyen (1978) had earlier termed this as chronic respiratory infection resulting to otitis media.

Otitis Media. According to Meyen (1978) this can be serous, acute or chronic depending on condition of fluid in middle ear space.

Trauma, Meyen calls this one injuries and he says blows on the side of head, water skiing injuries, diving injuries or sudden change in air pressure may cause eardrum perforation.

Mumps, Other unknown causes

## **Peri-natal Causes**

These are factors that affect the baby during birth. Although Ndurumo has not come out with these causes other writers have written on the same. Meyen (1978) noted the following as significant causes. Labour complications e.g. prolonged Labour. Foetus distress due to maternal shock, premature delivery

Lilly (1979) agrees that deafness is related to a number of facts such as pre-maturity and blood incompatibility; he identifies the following as major ideologies.

**Rubella** This he says attacks the mother during pregnancy affecting the baby especially during the first trimester, because of the attack at that crucial stage hearing, vision and heart problems occur (Lilly 1979).

**Meningitis** This covers adventitious deafness. Bacteria invades the labyrinths and is characterized by high fever (Lilly 1979)

**Hereditary Deafness.** To the above, the researcher wishes to add two major exogenous conditions identified by Meyen (1978): Lilly (1979) observes that this is transmitted either through dominant inheritance, sex link or recessive genes.

**Toxicity** .This is poisoning by drugs and Meyen (1978) classifies this as either as congenital exogenous or acquired exogenous. Congenital exogenous he says is when a pregnant mother takes the drugs whereas acquired exogenous is when the child takes the drugs Meyen (1978) identifies drugs like Neomycin, Gentamycin, Kanamycin, Asprin, Quinine and diuretics.

**Trauma** .This according to Meyen (1978) involves physical injuries or injuries affecting the skull, middle ear (ear drum or ossicular chain) or fracture of cochlea.

## **2.2.0 Review of related literature**

### **2.2.1 Categories of Hearing Impairment**

According to Kauffman and Hallahan (1991) there are three major classification of hearing impairment:, Conductive Hearing Loss, Sensorineural, Hearing Loss and Mixed Hearing Loss

#### **2.2.1.2 Conductive hearing loss**

This according to Kauffman interferes with transfer of sound in the outer and middle ear. These consist of the auricle, external auditory meatus, the tympanic membrane, ossicles

and middle ear cavity. Meyen (1978) says that in such a case the inner ear can function normally, i.e, conduction is impaired but perception is intact.

### **2.2.1.3 Characteristics of Conductive Hearing Loss**

Meyen (1978) identified the following characteristics:- Loss of air conduction , Presence of bone conduction. Conduction can be corrected by surgery or treatment. A person with the condition can benefit from amplification.

### **2.2.1.4 Sensorineural Hearing Loss**

This involves problems in the inner ear (labyrinth). This consists of the vestibular mechanism, cochlea and the auditory nerve Kauffman (1991). Kauffman clarifies that the vestibular mechanism is concerned with sense of balance whereas the cochlea is the sense organ of hearing.

#### **Characteristics of Sensorineural hearing Loss**

Meycn (1978) identified the following. This cannot be corrected surgically or medically. Amplification might not be very effective. . Sounds distorted due to damage in the nerve.

### **2.2.1.5 Mixed Hearing Loss**

Kauffman (1991) calls this a combination of both: conductive and sensorineural hearing losses.

#### **Characteristics of Mixed Hearing Loss**

Meyer, (1978) observes the following characteristics:-

Existence of air/bone gap, Hearing aid can be fitted and give some support, Persons with this loss is good candidates of amplification, Bells Association (<http://www.agbell.org/>)

uses the following terms to classify Hearing impairments, Congenital: Referring to hearing loss present at birth, Adventitious: Hearing loss acquired after birth. Post-lingual: Bell defines this as hearing loss acquire after speech development. Conductive hearing impairment: Bell says this involves complication of outer or middle ear.

### **2.3 Levels of hearing Loss**

To establish the degree of loss or ability to hear, Ysseldyke and Algozzine (1990) talk of intensity and frequency which are measured using an audiometer. Intensity or loudness is expressed in decibels (Hz) whereas frequency or pitch is expressed in hertz (Hz), which means cycles per second. Levels of hearing loss can be put into four major categories according to hearing aid help website ([www.hearingplanet.com](http://www.hearingplanet.com)). These are:

Mild hearing loss. (26– 40 dB). Moderate hearing loss (41 – 70dB), Severe hearing loss (71 – 90dB). Profound hearing loss. (Above 90 dB)

#### **2.3.1 Mild Hearing Loss**

According to the website ([www.hearingplanet.com](http://www.hearingplanet.com)), mild hearing loss is that which causes one to miss between 25 and 40% of speech signals. Ndurumo (1993) classifies this as those having between 26dB and 40dB.

#### **2.3.2 Moderate Hearing Loss**

The hearing aid help website says that when one has moderate hearing loss, 50 to 75% of speech signals are missed. The characteristics quoted are those having problems hearing

normal conversation, hearing consonants and problems when distance or visual cues change. Ndurumo (1993) categorizes this to be between 41dB and 70dB hearing loss.

### **2.3.3 Severe Hearing Loss**

The hearing aid help website cites severe hearing loss difficulties in all situations where speech may only be heard when one is speaking loudly or under most ideal circumstances. Ndurumo notes that this hearing loss can be between 71dB and 90dB.

### **2.3.4 Profound Hearing Loss**

Profound hearing loss occurs when there is no speech reception whether loud. One is forced to rely on visual cues or other modes of communication, for example sign language ([www.hearingpianct.com](http://www.hearingpianct.com)).

## **2.4 Hearing Aids**

A hearing aid is an electronic system that converts acoustic signals into electrical signals, amplifies and manipulates them before reconvertng them to acoustic signals then delivering them to the users ear Wouter (1991). Hearing aids are electronic devices that pick up and amplify sound according to the [Hearingaids101](http://Hearingaids101) website.

### **2.4.1 Components of Hearing Aid**

Basically a hearing aid has three components: a microphone, a receiver and an amplifier Ewens (1991). Other components according to Wouter (1991) are a telecoil and batteries.



### **2.4.2 Qualities of a Good Hearing Aid**

According to Ysseldyke and Agozzine (1990) audiologists are supposed to recommend the type of hearing aid that is suitable to meet the needs of a particular individual.

Ballantyne (1982) came out with six aspects to consider when selecting an appropriate hearing aid for a learner. These are: High amplification, High fidelity, Small size, light weight, Low power consumption, Low cost.

#### **Amplification**

Ballantyne recommends that a good hearing aid should have an acoustic gain of more than 25 dB and to avoid feedback it should be limited to 55 dB. He further says that volume control is essential for the user to meet a wide variety of situations and conditions and that the most appropriate device is one that has automatic volume control (A.V.C) He notes that an A.V.C. increases intelligibility. The sound pressure level (S.P.L.) output should be limited to 120 dB. Overloading will produce harmonic distortion Ballantyne (1982).

### **2.4.3 Types of Hearing Aids**

According to Hearing aid 101 (<http://hearingaid101.com>) there are a variety of hearing aids each having differing advantages depending on design and level of amplification and size. Hearing aid website identifies the following four as the most common.

In The Ear (I.T.E.), Behind the Ear (BTE), Completely in Canal Aids, Body Worn Aids, Speech Training Aid, Radio Hearing Aids, Loop induction Aid, Group Hearing Aids

## **2.5 Care and Maintenance of Hearing Aids**

### **2.5.1 General Care**

Mieier (<http://audcom.org>) recommends the following practices: Keep hearing aid from heat e.g. stoves, direct sunlight or radiators, To avoid batteries losing power avoid excess cold;. Always avoid excess moisture e.g. from saunas, steam baths, showers, rain, excess, sweat or snow; Avoid dropping the hearing aid; If inexperienced avoid opening the hearing aid case to adjust or repair. According to Widex ([www.widex.com](http://www.widex.com)) a hearing aid should not be exposed to knocks or excessive pressure? The aid should not be worn while showering or swimming, during radiation treatment, when using a hair drier, hair spray or other sprays. Below is an example of a maintenance kit from Widex.

### **2.5.2 Supply of Hearing Aids**

According to Kenya Society for the Deaf Children (1988) cited in Abilla (1990) presentation paper, the data on available hearing aids by 1988 in Kenya stood at 1, 420 individual hearing aids, 54 group hearing aids, 32 loop system and 4 radio receivers, These Abilla (1990) notes were found in 33 schools for the deaf to cater for over 3,000 school-going age children with hearing impairment. The researcher feels this is by far inadequate. "All types of hearing aids used by the hearing impaired persons in Kenya are imported from various countries" Abilla (1990). She further notes that non-governmental organizations like Eardrop Foundation and small commercial firms play substantial roles in provision of hearing aids.

On the same, Shipley (1991) says the United Kingdom instituted a national service to provide hearing aids in that country in 1948 when the National Health Service started. He

says it is on this concept that today's provision of hearing aids in the United Kingdom is based on. The researcher feels that is an example 'worth emulating in Kenya.

Lekagul (1991) discloses that Thailand's Thai Rural Ear Foundation planned to provide hearing aids and other equipments at prices that are affordable by local communities, This, he says, was after a realization that imported audiometers and hearing aids were "far too expensive for mass use." Lekagul further says that the strategy of this Rural Ear foundation is "mass production of approved equipment" with an aim of bringing down the cost per unit.

### **2.5.3 Effective use of Hearing Aids**

According to Miles (1991) the following aspects should be considered: Child to know how to take care of the hearing aid; Parents should understand how hearing aids works and their limitations; Teacher should know why pupils wearing a hearing aids, Community should be informed of reasons for wearing a hearing aid .Helfer in, Nober and Seymour, (1998).notes that for effective use of hearing aids, a hearing aid orientation is very important. This involves counseling a hearing aid user on how to care for and use the hearing aid.

## **CHAPTER: THREE**

### **METHODOLOGY**

#### **3.1 Research Design**

The study, with two dependent variables: The provision of hearing aids and the use of the same. The researcher used survey design to establish the provision aspects and case study to determine the effective use aspects of the study. In survey design the researcher got information from the sample suppliers of the hearing aids then generalized the findings on common aspects and frequency of occurrence. In case study, the researcher diagnosed the nature of problems faced by learners using hearing aids from one selected institution. These then were analyzed on common aspects and percentage of occurrence.

#### **3.2 Research Population**

The researcher targets suppliers and users of hearing aids and teachers of the deaf in Nairobi. There are ten registered suppliers of hearing aids and three schools/units for deaf children.

#### **3.3 Sampling Procedures**

Since there are two categories of respondents, the researcher intends to use two sampling procedures. For the hearing aid supplier, the researcher used stratified sampling. The researcher first classified the suppliers in three categories: private firms, hospital based and Deaf Association. From these categories, the researcher randomly picked a maximum of four. To select the respondents, the researcher used alphabetical arrangement. Names starting with "A" were skipped in preference for those starting with "B" and so on.

For the schools of the deaf the researcher used purposive sampling which also doubled as convenience sampling. This is because the study of users is a case study targeting one institution. The subject, selected will be a model unit for the deaf not far from Nairobi city centre.

### **3.3.1 Sample Population**

This is a smaller representative group within the target population. The researcher interviewed three categories of hearing aids providers: private firm based, public hospital based, and Deaf Association providers. A total of five hearing aids suppliers were interviewed or fill in questionnaires. The users were based in a case study of a model school for children with hearing impairments. Six teachers were selected to respond through the questionnaire. A checklist was filled for the 36 learners in the target school, making a total of 57 respondents.

### **3.4 Research Instruments**

These are ways the researcher employed to collect data. The researcher used questionnaires and interviews. The questionnaire will have three sections: general information, objective questions and structured questions for the teachers of schools for the deaf. For the supplier the researcher prepared an open-ended interview guide. In this, the researcher varied the order of questions and their wordings, ask follow-up questions based on responses Papalia, Olds and Fieldman (2001). In cases where the supplier were not be available for interview the open-ended interview guide was transformed to a questionnaire and left to be filled at the supplier's convenient time.

### **3.5. Research Procedure**

Before going to the field the researcher obtained an introduction letter from office of the Director of institute of open and distance learning. This introduced the researcher as a student attempting to carry out an academic research. The researcher sought permission from the concerned authorities of the study to access information and to be introduced to other offices of the Division. To ensure promptness and accuracy some of the questionnaires were administered by the researcher and others, which were sent to officers, who had to respond at there own time

### **3.6 Data analysis**

Both qualitative and quantitative methods were used to analyze the obtained information. The data were analyzed quantitatively using Explorative methods). Confirmative analysis was also employed to qualitative data sets to show relationship among variables, about the hearing impairments of categories, factors, hearing aids, and effective use. This involved sorting and summarizing the information obtained into a meaningful research data. From the findings conclusions were drawn to verify on the different themes of the study

### **3.7 Limitations of the study**

Lack of fluency in the use of sign language will hamper communication between the researcher and the learner. Exorbitant fares changed between the researcher residence and the research area. The researcher does not know the exact location of some of the supplier of the hearing aids

## CHAPTER: FOUR

### RESEARCH FINDINGS AND PRESENTATION

#### 4.0 Introduction

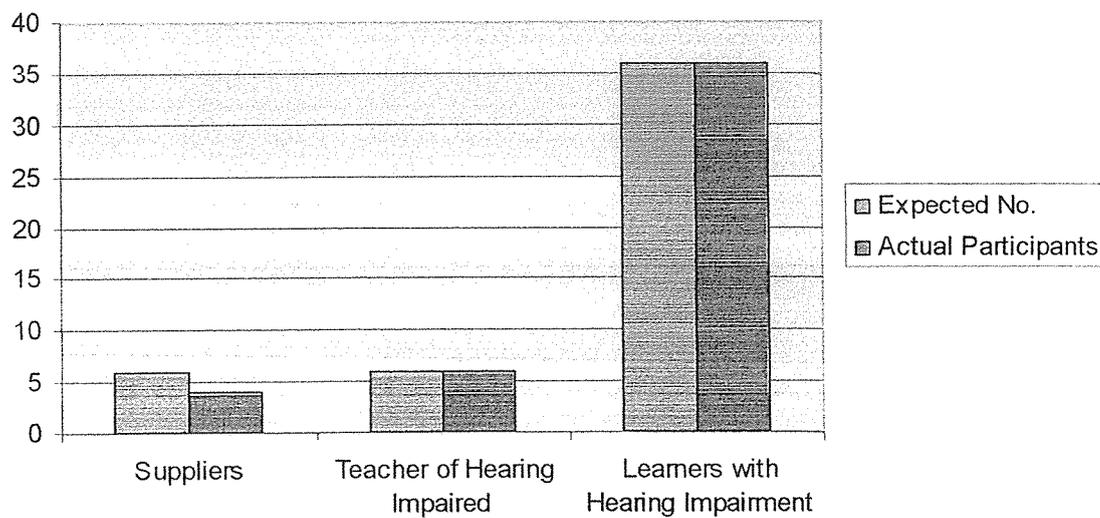
In this chapter the researcher presented and analyzes the data collected. To effectively achieve this, the researcher followed the objectives of the study. The researcher first put raw data in tabular form then put it in either pie chart form or bar graphs to make it easier for data interpretation. Pie charts are deemed appropriate for presentation of categorical data with each sector representing a specific category. Bar graphs were used to present quantitative data.

#### 4.1 Presentations, Observations and Analyses

##### Distribution of Respondents

Table 4.1.1: Distribution of Respondents

Respondent	Expected No.	Actual Participants
Suppliers	6	4
Teacher of Hearing Impaired	6	6
Learners with Hearing Impairment	36	36
<b>TOTAL</b>	<b>48</b>	<b>46</b>



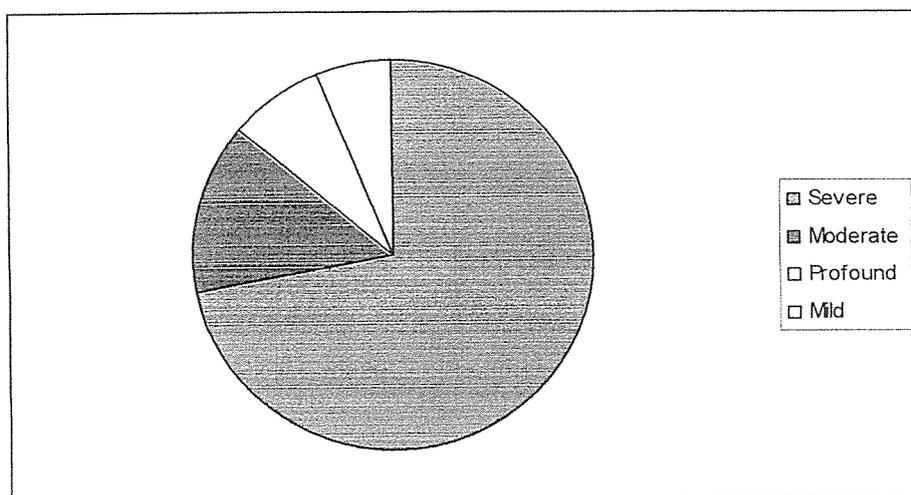
**Fig 4.1.1: Distribution of Respondents**

The disparity between the expected number of participants and the actual respondents was minimal, so the researcher could term the data collected as representative. There were only two participants who could not fit in the schedule set by the researcher because they closed for Christmas holiday.

The researcher presents data collected from the above in 3 sections:

- Section A is data collected from observation of learners with hearing impairments from the case study
- section B is data collected from teachers in form of questionnaires ;
- Section C is information from the suppliers collected by interviews.

## 4.2.0 Categories of learners with hearing impairments



**Fig.4.2.0. Categories of Learners with HI**

### Observation

The above analysis shows in the target population the majority of the learners suffer severe hearing loss with it taking more than half of all the other categories. Mild, moderate and severely impaired person provide the right candidates for hearing aids.

### Analysis

According to the data presented in the graph 3a seventy two percent (72%) of the sample population had severe hearing impairments, fourteen (14%) had moderate, eight percent (8%) were profoundly impaired and only six percent (6%) had mild hearing impairments.

#### 4.2.1 Acquisition of hearing aids

Table 4.2.1 hearing Aids provision

Response	Frequency	Percentage
Donated	16	44
None	14	39
Bought	6	17
<b>Total</b>	<b>36</b>	<b>100</b>

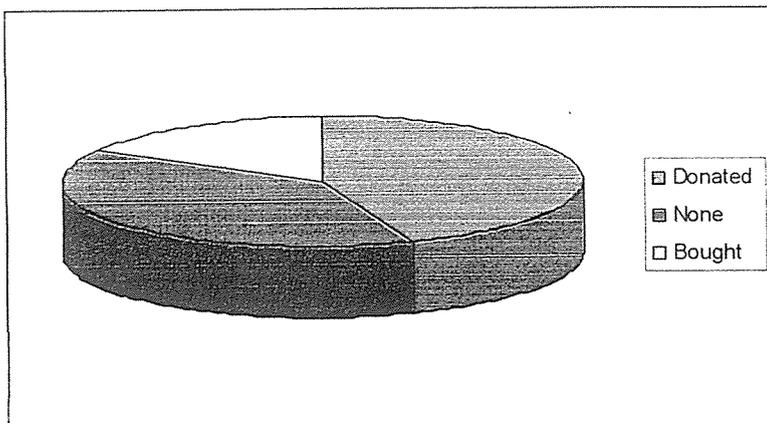


Fig.4.2.1. Hearing Aids Provision

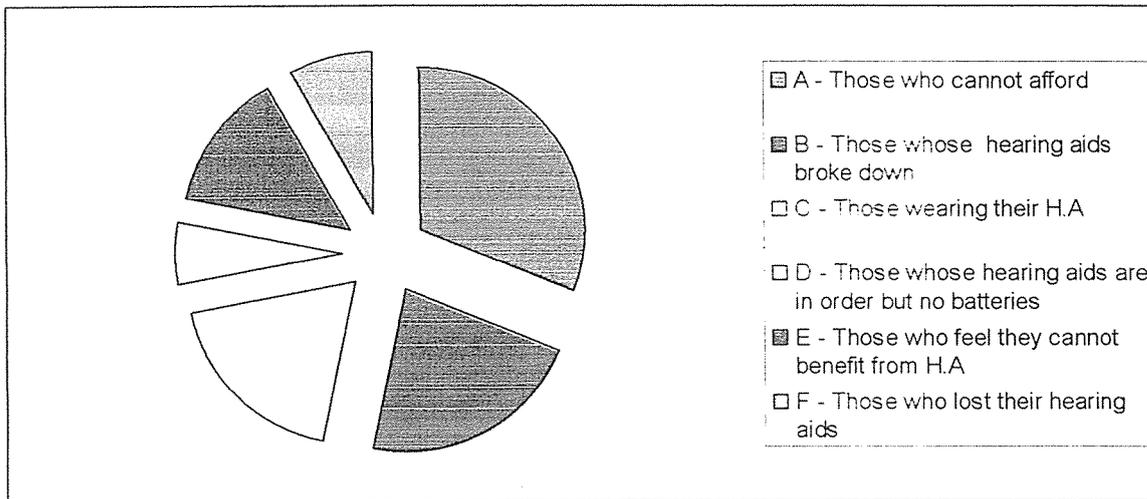
#### Observation

In other words according to data above in the whole sample population, 61% had at one time owned a hearing aid while 39% had had none. This can be termed as a plus to the supplies or donors as more than half of the learners have benefited from hearing aids.

#### Analysis

The data presented in fig 4a show that 44% of the respondents had acquired their hearing aid from donations; 39% had none, where as 17% bought their own.

## 4.2.2 The effective use of hearing aids



**Fig 4.2.2 Effective Use**

### Observation

According to the data above the 31% of the respondents who have never owned a hearing aid would wish to use them but their parents can not afford them. Of the remaining total of 61% who had at one time owned an aid, the majority unfortunately said their aids were out of order, 14% kept their aids in their lockers , 8% had no batteries and 6% had lost attitudes , while 2 (33.2%) suggested ignorance and the same number suggested lack of theirs. This left 19% only wearing their aids. This suggested the presence of another problem on top of lack of aids – the negative attitudes or self – consciousness towards wearing the aids.

### Analysis

Majority of respondents, 31%, would wish to use hearing aids but their parents can not afford to buy for them. Surprisingly this is followed by 22% whose hearing aids are put

of order as a result of mishandling or careless storage and have not been repaired. 19% were observed to have been wearing their hearing aids while 14% had their hearing aids at school but though in order and having batteries they were not wearing them but kept them in their lockers, 8% had aids without batteries and 6% had lost theirs through theft or leaving them in buses.

#### 4.3.0 Teachers in the institution of the hearing impaired

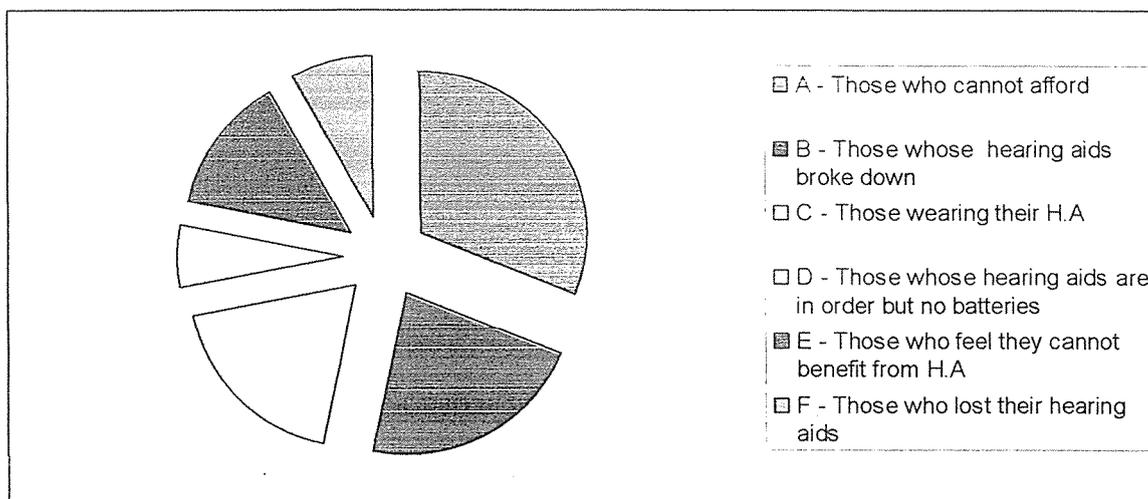


Figure4.3.0 Teachers in the institution of the hearing impaired

### 4.3.1 Factors affecting adequate provision of hearing aids

Table 4.3.1 provision of hearing aids

RESPONSES	FREQUENCY	PERCENTAGE %
A-Cost of H aids	6	100%
B-Negative attitudes	3	50%
C-Lack of maintenance services	2	33%
D-Ignorance	2	33%
E-Availability	1	17%
F-Theft	1	17%
G-Lack of training personnel	1	17%

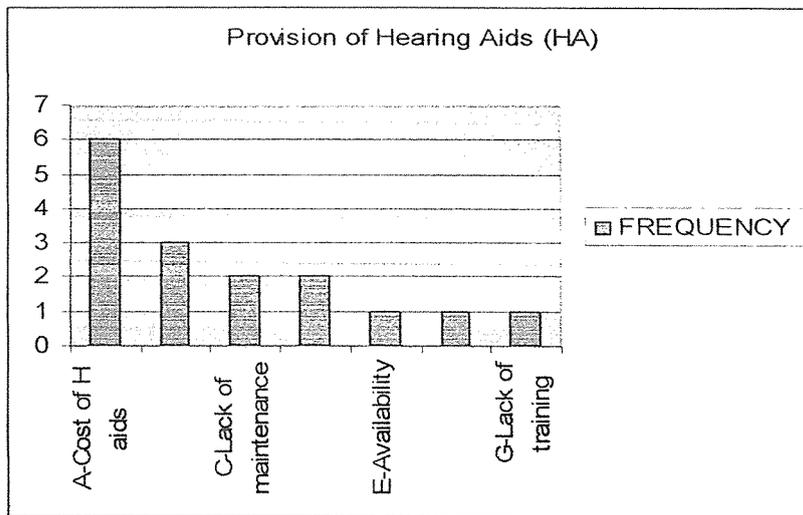


Figure 4.3.1 provision of hearing aids

## Observation

The above findings on affordability coincide with what was cited in the previous findings. Negative attitudes can explain why other learners, despite having aids that were functional, were not wearing them.

## Analysis

All the 6 respondents, translating to 100%, conceded that cost is a factor that negatively affects acquisition of hearing aids, 3 respondents (50%) suggested negative maintenance services. However, 1 felt that availability was a factor, I felt and more thought, lack of trained personnel had a negative effect.

### 4.3.2 Factors that hinder effective use of hearing aids.

Table 4.3.2 Factors that hinder the Effective use

RESPONSE	NUMBER
A-Lack of maintenance services	2
B-Lack of batteries	4
C-Negative attitudes of user	3
D-Lack of awareness	3
E-Carelessness	2

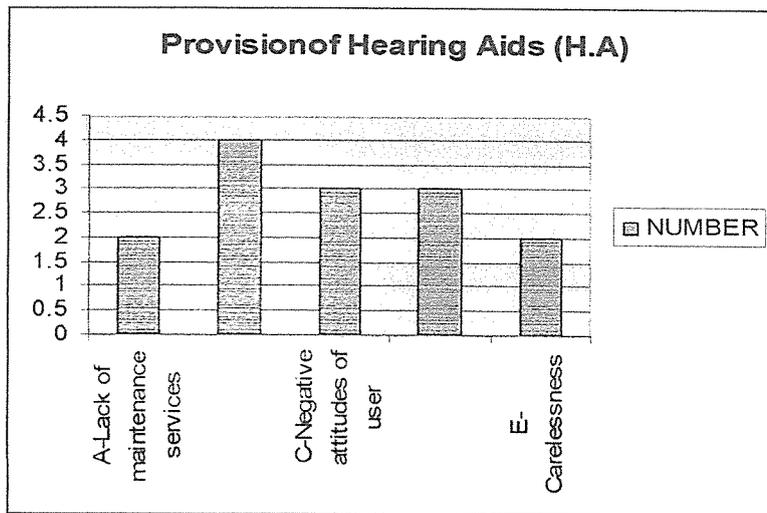


Fig4.3.2 Factors that hinder the Effective use of hearing aids

### Analysis

According to graph 3b, three had a negative attitude towards using hearing aids. For four respondents the lack of batteries was a factor affecting effective use. Three had a lack of awareness; two lack of maintenance services was a factor while two others was a factor affecting effective use.

### 4.3.3 Problems that the users face during the use of hearing aids

Table 4.3.3 users' problems

Responses	Number	Percentage
A-Cost of hearing aids	3	75%
B-Lack of adequate trained personnel	3	75%
C-Negative attitudes	2	50%
D-Preference of sign language	2	50%
E-Background noise	1	25%
F- Insurance company do not cover hearing aids	1	25%
G-H. Aids feels foreign to the ear	1	25%
H-Replacement of ear moulds	1	25%
I-Lack of proper guidance and counseling	1	25%

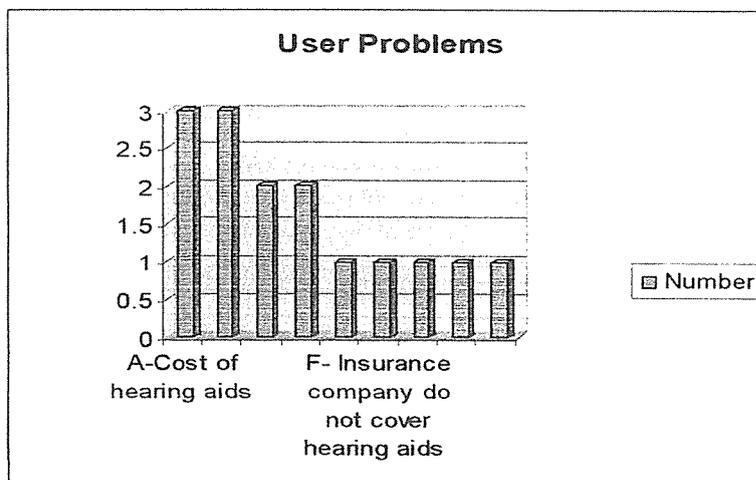


Fig 4.3.3 user's problems

## **Observation**

The most acclaimed solution to the aforementioned problems was awareness campaigns.

## **Analysis**

According to the table the most popular response on factors affecting the user were cost of hearing aids and lack of adequate trained personnel's. These were followed by negative attitudes and the deaf people's preference for sign language to speech. One respondent each noted one among the following as contributory factors: presence of background noise, lack of insurance.

Provision of maintenance services, donations of hearing aids and government organizing to supply hearing aids can solve the problem of supply where as the lowest number of respondents (1 out of 6) went for training on care and maintenance, Provision of samples of existing makes, provision of after sales services, provision of high quality makes and encouragement of users are a remedy.

### **4.4.0 Survey**

In this section the researcher presented data collected from the suppliers. The suppliers interviewed had masters or above degrees in Audiology (therefore they had wealth of knowledge) and had been interacting with hearing aids users for over 4 years.

Below is a table on major manufacturers and private firms acting as their outlets in Kenya.

#### 4.4.1 Hearing aid suppliers in Kenya

Table 4.4.1 Hearing aids suppliers

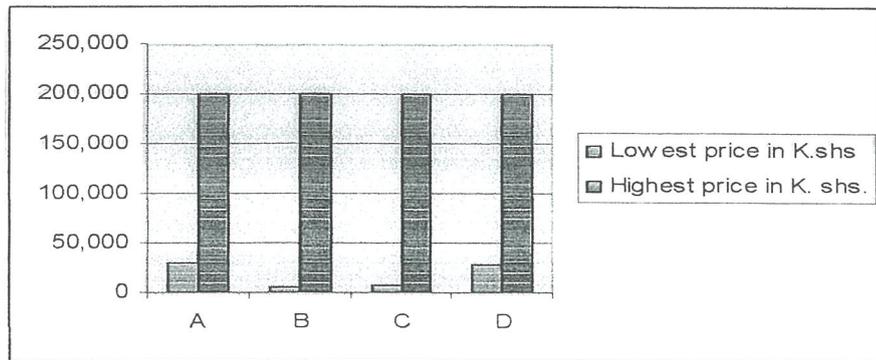
Manufacturer	Outlet
Widest	Beam Hearing Center
Siemens	House of Hearing
Phonak	Hass
Starkey	Nairobi Audiology Center
Oticon	Giant Hearing Center
Danorox	Giants Hearing Center

Four of the above have been sampled and their proprietor interviewed or filled a questionnaire. The sampled respondents will here in be referred to as A, B, C, and D for anonymity and confidentiality. A factor that featured as hindering acquisition of hearing aids was their cost. The suppliers responded thus:

#### 4.4.2 The lowest and highest price for the hearing aids supplied

Table 4.4.2 Cost of hearing aids

Firm	Lowest price in K.shs	Highest price in K. shs.
A	30,000	200,000
B	5,000	200,000
C	8,000	200,000
D	28,000	200,000



**Fig 4.4.2 Cost of hearing aids**

### Analysis

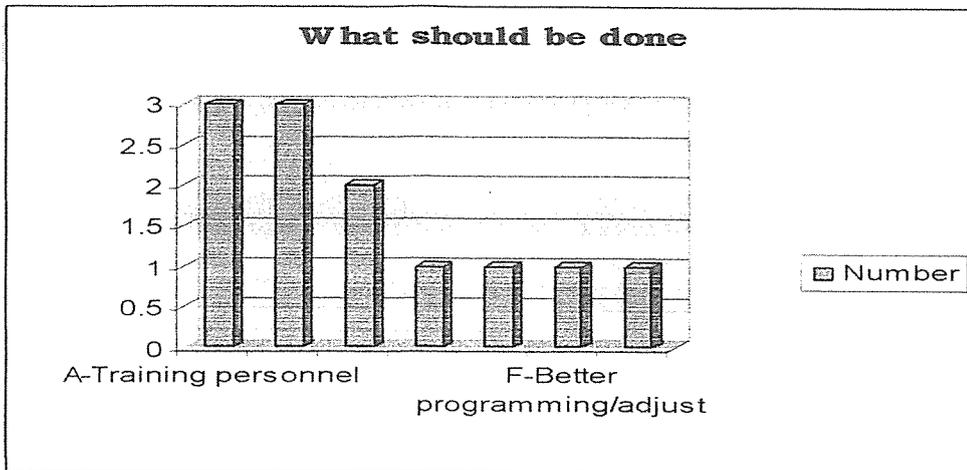
According to the above table the highest price of a hearing aid in the firm that respond to the questionnaire or participated in the interview is pegged at K. shs . 200,000/= the least price charged was K. shs 5,000/= followed by K. shs . 8000/= the remaining two firms charged K. shs . 28,000/= and K. shs . 30,000/=

### 4.4.3 Solutions to the problem

**Table.4.4.3. Solutions to the hearing impairments.**

Response	Number
A-Training personnel	3
B-public awareness campaign	3
C-Use of modern H aids	2
D-N.H.I.F to cover costs	1
E-Insurance to cover costs	1
F-Better programming/adjust	1
G-Regular replacement of ear mould	1





**Fig 4.4.3 Proposed solution**

### **Analysis**

According to data presented in the graph above three of the respondents felt public awareness campaigns and training personnel can solve the problem two respondents felt the use of modern hearing aids is a solution where as one each opted for regular replacement of ear mould, better programming or adjustment insurance companies to cover costs and that National hospital insurance fund should be involved in procurement of aids.

### **4.5 Discussion**

As a preface to the researcher feels that it is necessary to define what the concepts effective provision and effective use of hearing aids are supposed to mean in an ideal situation.

Effective provision according to the researcher is a situation where all persons with hearing impairments willing to use hearing aids could be provided with suitable gadgets supported by necessary information on the particular aids capabilities and limitations. On the other hand effective use is where those provided with hearing aids are seen to use them at all situations of their wakeful hours so long as they do not jeopardize their health or the safety of the gargets.

On carrying out the study and subsequently analyzing the data, the most glaring factor that most respondents pointed out as negatively affecting provision (fig 6a, table 1b table 2c & fig 2c) in the cost of hearing aids. Lekagul (1991 ) cited in this paper review of related literature is quoted saying imported audiometer and hearing aids as being far too expensive for mass use According to table 1c all the major suppliers in Kenya only act as outlets to foreign companies. The researcher also feels a price quotation is staggering considering who the potential customers are supposed to be. Other major factors that affected provision are negative attitude ignorance and lack of maintenance services.

On effective use, the respondents still felt the exorbitant price lack of batteries negative attitudes and carelessness are key factors that prevented the attainment of the ideal picture defined at the beginning of this chapter. According to jump and pearl (1991), previously cited in this paper's literature review three of the objectives of a hearing aids are: minimal cost low power consumption date and suitability to the users' needs. Abilla (1990) (see literature review ) says that the hearing aids used in Kenya are imported from

various other countries The researcher feels it would take an act of clairvoyance for a gadget manufactured miles and miles away to perfectly suit the local users.

Other factors found to affect use include: preference of sign language preference of background noise and lack of proper guidance and counseling. according to Kauffman (1991) social and personality development is dependent on communication and deficiency in this leads to isolation of the hearing impaired hence use of sign language should not act as an excuse on not using hearing aid to get information passed through speech according to Phonak website quoted in the literature an analogue programmable aid new circuitry can be used to sieve out most of the background noise making most speech sounds accessible to a person with hearing impairments .

On looking at the study as a whole the researcher feel combining both aspects of provision and use made the task of making the study exhaustive totally unattainable. Given another opportunity to carry out a similar study the researcher could take either NOT both. The discovery that the researcher found most incredible was a hearing aid the size of a human thumb could cost more than K.shs 200,000 in the local market. The researcher could only term such a price as obscene.

## CHAPTER: FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Summary

The study was based on a strong conviction that every hearing impaired person should be given a chance to use hearing aids. This is from a realization that un remedied hearing loss can have far –reaching and not easily reversible consequences. The researcher felt that hearing aids were not adequately used despite the above.

In view of the above the researcher set out to investigate barriers to effective use and provision of hearing aids to learners with hearing impairments in Nairobi province. On getting representatives findings the researcher intended to give recommendation that could help reverse the trend. The above acted as the frame work on which the study was to be done.

In chapter 2 the researcher took time to read, select and compile literature that could give insights on the researcher's area of study. This was gotten from textbooks, papers presented in conference, brochures, and journals Effective use of the hearing aids is dependant on nature and severity of a given hearing loss. So the researcher gave this chapter as a prelude of hearing loss, categories and characteristics a base for the specific areas of concern i.e. the hearing aids.

In chapter three the researcher graphically outlined following the standard criterion how he planned and executed the actual data collection. The researcher used checklists,

interview guides and questionnaires to achieve this. The area of study was Nairobi. The target population comprised hearing aid suppliers, teachers of learners with hearing impairments. The researcher used stratified random sampling where he first grouped the respondents into three categories before picking the samples at random. The sample population was made up of 6 major hearing aid suppliers, 6 teachers of hearing impaired and 36 learners with hearing impairments for the case study. Interviews were to be conducted with the suppliers; the questionnaires were to be filled by the teachers where as the check list was to be filled by the researcher from observation.

The researcher chose interviews on the suppliers because they could be conducted during December recess when there was adequate time. The questionnaires were deemed appropriate for lecturers as they could be left for filling and collected later. The researcher used a check list for the learners as interviews with the rest of the 36 respondents could have been virtually inconvenient, time consuming and un acceptable by institutions' administrations as they could have collided with their programmes .

In chapter four the researcher presented, analyzed and made observation on the data collected. The presentation was done in two forms: pie charts and bar graphs. These were used for presentation of categorical and quantitative data respectively.

## **5.2 Conclusion**

It is evident from the findings that the major barriers to effective provision and use of hearing aids are unaffordable, lack of adequate training and maintenance and lack of adequate information of where and how to get fitted with a hearing aid. To reverse this, the respondents suggested that awareness campaign be held, prices of the hearing aids be reduced, maintenance services be provided and more organizations should come and donate the hearing aids.

## **5.3 Recommendations**

The most glaring barrier to effective provision and use of hearing aids is their exorbitant prices. In view of this the researcher recommends investigations should be conducted into the possibility of the invention of hearing aids suited for local users the literature cites two other governments (United Kingdom and Thailand) that have made initiatives to endeavor to come out with aids suitable for their people The question that is yet to be answered is why not our government? The researcher also recommends that churches non governmental organization should step in and supplement the efforts of the government to provide hearing aids. This should be done as soon as possible in liaison with administrations of special schools where the hearing aids users abound.

## REFERENCE

Abilla, C. M. (1990), *Hearing Aids for 3<sup>rd</sup> World*, Paper presented in a conference in London held between July 25 —29 copy in KISE Library.

Bells Association (Sep 2004) <http://www.agbeii.org>.

Bov'e, G. J. (1999), Care and Maintenance of Hearing Aids and Earmoulds: The Audiology Awareness Campaign, <http://www/Audcom.org>.

Evans, D, (1991), Radio Aids, Group Aids and Auditory Training Units. The Hearing Their Production Delivery System and Effective Use, London, R.N.I.D. pg 6164.

Ewens, S. C. (1991), The Rearing Aid: Their Production Delivery System and Effective Use, London, R.N.LD. (Royal National Institute for the Deaf) pg 13-16.

Hearing Aids, Hearingaid 101 (Sep 2004), <http://www.Hearingaid101.com>.

Hearing Aids, Starkey (Jan 2005) <http://www.starkey.com>.

Jump, D. S. and Peart, M. A. (1991), Development of a Low-Cost Hearing Aid, The Hearing Aid: Their Production Delivery System and Effective Use, London: R.N.T.D. pg 41-47.

Lilly S. M. (1979), Children with Exceptional Needs, New York: Holt, Rinehart and Winston.

Meyen E. L. (1978), Exceptional Children and Youth: An Introduction, Zenver: Love Publishing Company.

Miles (1991), The Hearing Aid: Their Production delivery System and effective Use. London R.N.I.D.

N.I.D.C.D. Hearing Aids (Sep 2004), <http://www/nidcd.nih.gov/hearingaid.asp>, N.I.D.C.D.: National Institute on Deafness and Other Communication Disorders.

Ndurumo, M. M. (1993), Exceptional Children, Nairobi: Longman Kenya Ltd.

Papalia, D. E. Olds, S. W. Feldman, R. B. (2001), Human Development 8th Edition, Boston: iv McGraw Hill,

Phonak Hearing Systems (Dec 2004), <http://www.phonak.co> or <http://www.hear-it.org>.

Seymour C.M and Nober ER. (1998). Introduction to Communication Disorders; A Multicultural Approach. Boston Butterworth.

Shirpley, A. D. C. (1991), The Provision of Rearing Aids on a National Basis; The Hearing Aid: Their Production Delivery System and Effective Use, London: R.N.I.D.

Siemens Audiology (Dec 2004), [http//www.hearing-siemens.com](http://www.hearing-siemens.com).

Smith J. (1991) The Rearing Aid: Their Production Delivery System and Effective Use. London, R.N.I.D.

## APPENDIX 1: RESEARCH QUESTIONNAIRE

Dear Respondent

I am a student pursuing a degree in primary education at Kampala international university. Following the requirements for finalizing my study, am required to conduct a research study. I thus have to conduct a research study with the title. So as to come up with this study, I need your support by helping to complete this questionnaire. The information that you will provide will be treated with high degree of confidentiality. Thank you in advance.

**NOTE. Please tick where appropriate.**

### Background information

Please tick the appropriate box

1. Gender  Male  Female
  
2. Age 20-29yrs  30-35yrs  36-44yrs  above 45yrs
  
3. Have you ever undergone specialized training handling learners with hearing impairments?  
Yes  NO
  
4. Do you have learners in your class who use hearing aids?  
Yes  NO
  
5. If yes, how many?.....
  
6. Who fits the hearing aids? .....

7. Who supplies the hearing aids?.....

8. Do you have any knowledge of fitting hearing aids?

Yes  No

9. Do you have any knowledge of the care and maintenance of hearing aids?

Yes  No

10. Once fitted with hearing aids do you think the learners benefit from using them?

Yes  No

**Note please .write your response in the space provided**

1. What categories of learners with hearing impairment do you have in your class?

1.....2.....3.....

2. What types of hearing aids are available and: accessible to the learners with hearing impairment?

.....

3. How are the hearing aids cared for and maintained?

.....

.....

4. In your opinion what hinders adequate supply of hearing aids?

.....

.....

5. Are the hearing aids used effectively? If no, give reasons for the ineffective use.

.....  
.....

6. How can the use and provision of hearing aids to learners with hearing impairment be improved?

**APPENDIX: 2      A STRUCTURED INTERVIEW GUIDE TO HEARING AIDS  
SUPPLIER**

1. Could you tell me your occupation?
2. For how long have you been involved in this occupation?
3. Did you receive any specialized training before starting your career?
  
4. Where and for how long?
  
5. What does your occupation entail?
  
6. From where and: how do you get the hearing aids that you sell?
  
7. Who are your customers?
  
8. Do you offer after sale maintenance services to your customer?
  
9. If yes, what services do you offer?
  
10. If no, why don't you: offer these services?
  
11. What are the most common types of hearing aids that you supply?
  
12. What problems do you think your customers face when using the aids?
  
13. How do you think these problems could be solved?

**APPENDIX: 3      CHECK LIST**

**To be filled by the researcher**

1. Distribution of learners in the classes

CLASS	TALLY	NUMBER
A		
B		
C		
D		
E		
F		
TOTAL		

2. Categories of learners with hearing impairment.

CLASS	TALLY	NUMBER
Mild		
Moderate		
Severe		
Profound		
TOTAL		

Tel. 2722861

Route 103, 111, 135, 126.

11. Hass Hearing Centre

Posta Sacco Plaza, floor

University Way

Tel. (254-20)251177; (254-20) 311554

0722-517611; 0733-603972.

12. Nairobi Giants Centre

Nairobi Hospital

Hurlingham Road

Route 46, 46C.

13. Kenya Society for the Deaf Children

P.O. BOX 42306 — 00100 NAIROBI

Bible Hse 2<sup>nd</sup> flr Langata Rd

Tel. 600731

607751

