ANALYSIS OF AVAILABILITY AND ADEQUACY OF SUPPORT SERVICES FOR STUDENTS WITH VISUAL IMPAIRMENTS IN TANZANIA INSTITUTIONS OF HIGHER LEARNING

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION ADMINISTRATION, PLANNING AND POLICY STUDIES OF THE OPEN UNIVERSITY OF TANZANIA

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CERTIFICATION

The undersigned certify that he has read and hereby recommend for examination by the open University of Tanzania a dissertation titled: “Availability and Adequacy of Support Services to Students With Visual Impairments in Tanzania Institutions of Higher Learning” in Partial fulfillment of the requirements for the degree of Masters of Education (Administration, Planning and Policy Studies) of the Open University of Tanzania.

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Date

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DECLARATION

I, **Alfred Michael Nsimbila**, do hereby declare that this dissertation is my own original work and that it has not been submitted and will not be presented in any other University for a similar or any other degree award.

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Signature

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Date

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ABSTRACT

In recent years, shortage of human and technical resources for learners with disabilities has been a common cry at all levels of educational institutions in Tanzania. The purpose of this study was to analyze the availability and adequacy of support services to students with visual impairment in Tanzania higher learning institutions. Anti-positivist paradigm that supports neutrality of approaches choice between qualitative and quantitative was adapted, warranting the use of survey design procedures to collect data from four Universities accommodating students with visual impairments. The random and purposeful sampling strategies were used for this study. The sample constituted 37 participants where by 4 administrative staff, 30 students were interviewed. The Focused Group Discussion method was used involving a total of 15 students. A checklist method was used to collect data from 3 technical staff.

The findings revealed the extensive scarcity of both human and technical resources in the sampled institutions and inadequate resources were found unevenly distributed across the sampled institutions. The levels of utilization of human and technical resources across the said institutions were found at 50% and 36.4% respectively. Likewise, most of the volunteer human resource respondents were found with minimum education qualifications of advanced level certificate while majority of the rest had a diploma or degree. It was revealed that the service providers were less equipped with appropriate skills required to handle students with visual impairment in different academic settings. The common technical resources used by the sampled students were of low quality and only a few were of high quality. The study suggested too that the support services across the sampled institutions are relatively of low quality. Improvement of existing policies and further studies were recommended.

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CHAPTER ONE

1.0 BACKGROUND AND STATEMENT OF THE PROBLEM

This chapter presents introductory information about the status of support services provided to students with visual impairments in higher learning institutions around the world. The main focus has been the background to the problem of shortage in human and technical resources and the level of utilization of these resources by students with visual impairments in the context of Tanzania higher learning Institutions. The chapter has covered aspects such as; the concept of visual impairment, types and causes of visual impairments, education of people with visual problems in Tanzania and Types and levels of services for students with visual impairments. Other areas covered include; the statement of the problem, purpose and objectives of the study, research tasks and questions and the conceptual framework of the study.

1.1 Background to the Problem

The population of people with vision problems in Tanzania is not negligible. **A**ccording to the World Health Organization (WHO), Tanzania by 2002 had 3,456,900 people with disabilities (PWD'S), out of whom, persons with blindness were 933,363, or 27%. This number is approximately equal to the total population of Zanzibar (984,625). This figure is not insignificant in national development, provided that a person with blindness is educated and well utilized by the society (Maswanya, 2007).

1.1.1 The Concept of Visual Impairment

Visual impairment is a broad term used to describe the complete or partial loss of vision. UNESCO(2009) illustrates visual impairment as follow;

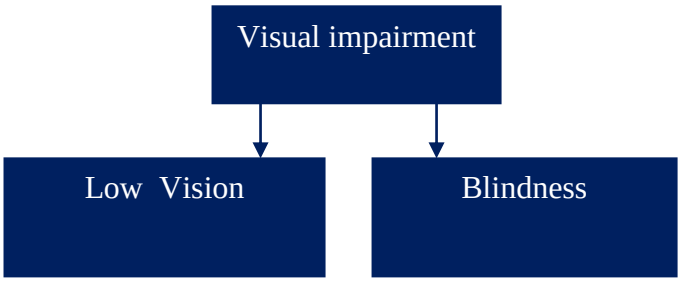

Figure 1: UNESCO Illustration of Visual Impairment

Source: UNESCO, 2009: 42-43

Blindness;A person who is blind has a total or high degree of visionLoss and can not distinguish between light and darkness.

Low Vision;A person with low vision has severely reduced visualAcuity, a significantly obstructed visual field, contrast sensitivity, or all thethree (UNESCO 2009).

The World Health Organization likewise puts visual impairment into the same two main categories, but here, they are further subdivided into five minor categories based on the levels of visual acuity.The low vision category is subdivided into two minor categories 1 and 2 which represent moderate and severe visual impairments respectively. The category of blindness is subdivided into three minor categories 3, 4 and 5. These represent profound visual impairment, near-blindness and blindness respectively. While in the first two minor categories, the individual can have some

sort of light perception, that is, LP, in the blindness category, there is totally no light perception, that is, NLP (Colenbrander 2002: 7).

1.1.2 Visual Acuity And Acuity Notations

The three terms; visual acuity, visual field and contrast senstivity mentioned earlier assume the following meaning;

Visual Acuity is the ability to perceive details presented with good contrast.

Visual Field isthe ability to simultaneously perceive visual information from various parts of the environment.

Contrast Sensitivity is the ability to perceive larger objects of poor contrast(Colenbrander 1999:4).

Unlike for the contrast senstivity, measurement techniques for visual acuity and visual field have been well established and standardized since losses in these functions have well-recognized effects on activities of Daily living of an individual (Colenbrander (1999: 4).

Visual acuity notations. Visual acuity fractions compare the subject's performance to a performance standard. In a Snellen fraction for example, the numerator indicates the testing distance (i.e. the distance at which the subject recognizes the symbol) and the denominator indicates the letter size, expressed as a distance at which the eye recognizes the symbol (Colenbrander, 1999:6). The Snellen chart is an eye chart that eye care professionals use to measure how clearly a person can see. figure 1.2 below displays the common snellen chart used by ophthalmologists

and other medical practitioners.

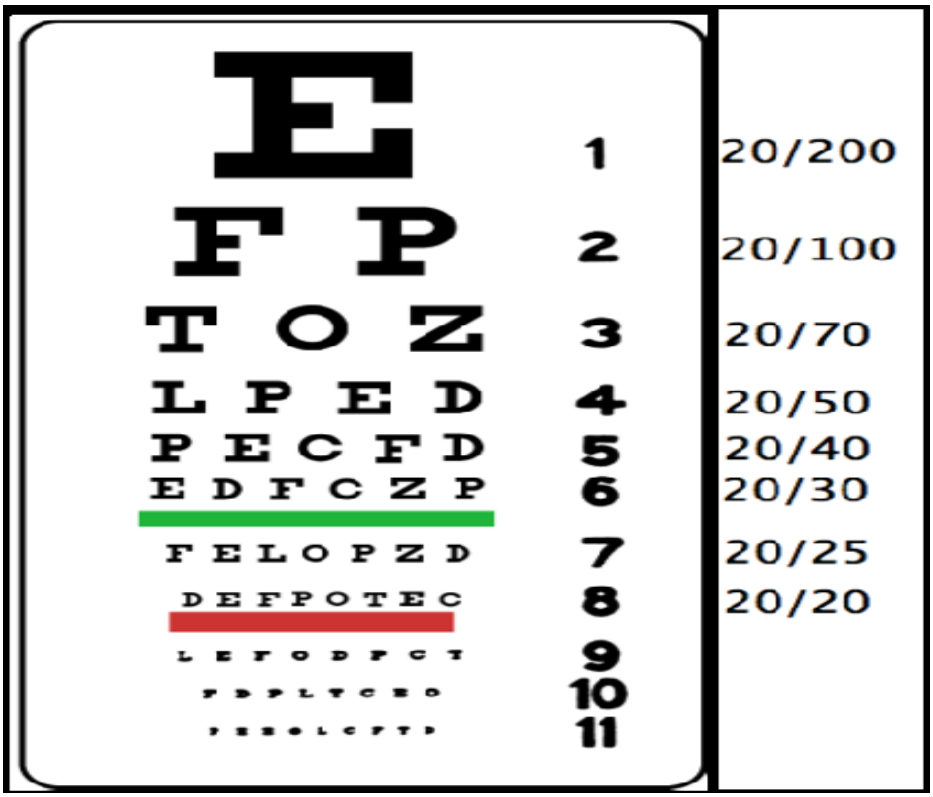

Figure 1.2: A Snellen Chart

Source Eevans, 2006).

From the chart, the fraction 20/20 represents the vision that can be regarded as normal. It is termed as 20/20 visual acuity. If you can read the big E at the top but none of the letters lower than that, your vision is considered 20/200. This means you can read at 20 feet a letter that people with 'normal' vision can read at 200 feet. So, at 20/200, your visual acuity is very poor (Access Media Group – [AMG], (2014).

Visual field loss. After visual acuity loss, visual field loss is the next major cause of visual deficits and it can exist independently from visual acuity loss (Colenbrander,

(1999:12-13). Visual field losses affect the individual's ability to see objects in the peripheral posisitions when he/she focuses his/her eye on a central point. Visual field tests are normally performed in order to detect either causes of vision loss or consenquences. Causes of vision loss may be diseases such as glaucoma, diabetes, high blood pressure and pitutary gland disorders to mention a few. Consequences of visual field loss are most evident in orientation and mobility performance of an individual. Testing of visual field involve one eye after another and the procedure is some how complex that it will not be discussed here for convinience.

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1.1.3 Types and Causes of Visual Impairment

The population of students with visual impairments is very diverse. According to Clayton, (2010), these students:

> First, 'May be totally blind or have varying degrees of low vision'
>
> Second, 'Range from birth to 22 years of age'
>
> Third, 'May be born with a visual impairment or may have acquired a visual impairment at a later time in their life'
>
> Fourth, 'May or may not be learners on the academic level of their sighted age peers'
>
> Fifth, 'May have hearing impairments or what is called deaf blindness'
>
> Six, 'May have any number of other disabilities (mild to severe cognitive impairment, physical disabilities, other sensory losses, emotional or behavioral problems, autism and/or learning disabilities'
>
> Seventh, 'May have a visual impairment in any part of the eye structure or due to neurological causes such as cortical visual impairment'

Eighth, ‘May have additional medical needs and considerations’ (Clayton, 2010).

Despite all these, students with visual impairments have the right for education, and education of people with visual problems in Tanzania has a historical background.

1.1.4 Education for People with Vision Problems (Visual Impairment) in Tanzania

Education for people with visual impairment in Tanzania can be traced back from early 1950s whereby the first school for the blind was built at a village known as Buigiri by the Anglican church (Possi, 1996). Later on, other schools, such as the Irente Primary School in Lushoto, Tanga region, and the Furaha School, located in Tabora Municipality were built.Although education services for children with visual impairments has been offered at various levels ranging from primary through secondary to higher learning institutions (UNESCO, 2006:21), most of them however, have been provided at the primary school level only (Karakoski, & Strom, 2005:13). A special need teacher training college was established in 1993 which offer certificate and diploma in special needs education (UNESCO, 2006:21).

Despite the noted progress, special education provision in Tanzania faces the following problems: lack of specialized equipment and teaching/learning materials; insufficient specialist teachers for special needs education, Limited education opportunities. For example students with visual impairments cannot study mathematics or science at post primary levels (UNESCO, 2006:21). Either, to date only Sebastian Kolowa Memorial University provides a degree course with major

emphasis in Special needs education (Msuya, 2009b). Adding to, there are still problems with policy on special education; the budget for special needs education is inadequately allocated taking an example of school for the blind, they receive the same capitation grants regardless of high price of their equipments used for learning, as such special needs education has not been given its due attention (Msuya, 2009a).

Experiences at one of the Universities under this study have depicted discontentment among students with visual impairments regarding the nature and level of support services program implemented by the University. They assert for example that, the process of procuring the assistive technology and availing it to the learner takes a very long time. The equipment may be purchased a long time after commencement of the academic year (Special Education Unit Management-UDSM, Personal Communication, April, 2012). In addition to that, to date there is no clearly stipulated disability policy document in this university. Provision is more or less an ad-hoc response to the needs raised by the students rather than being a systematic and pro-active in approach (Hadjikakou, and Hartas, 2007). Either, experiences from the special unit indicate that, most of the physical facilitieslike libraries, computer labs and notice boards are not accessible to students with visual impairments.

Despite the fact that a substantial amount of technical, and human resources has been allocated, questionable satisfaction within students with visual impairments has been depicted. Furthermore, since the program was established, in late 1970s, inadequate research had been carried out to see how effective the implemented

program is (Special Education Unit Management-UDSM, 2011). Thus, the questions such as: how much the students are satisfied with the program, whether the availability of technical and human resources as well as utilization of the same are sufficient in parallel to the needs of students with visual impairments, are left unanswered. With all these points in mind, the researcher aimed at finding the answers to these questions, as the whole program needed to be evaluated to find out whether the developed and organized experiences were producing the intended outcomes or not. The Figure1.3 shows the model of analyzing human and technical resources for students with visual impairments.

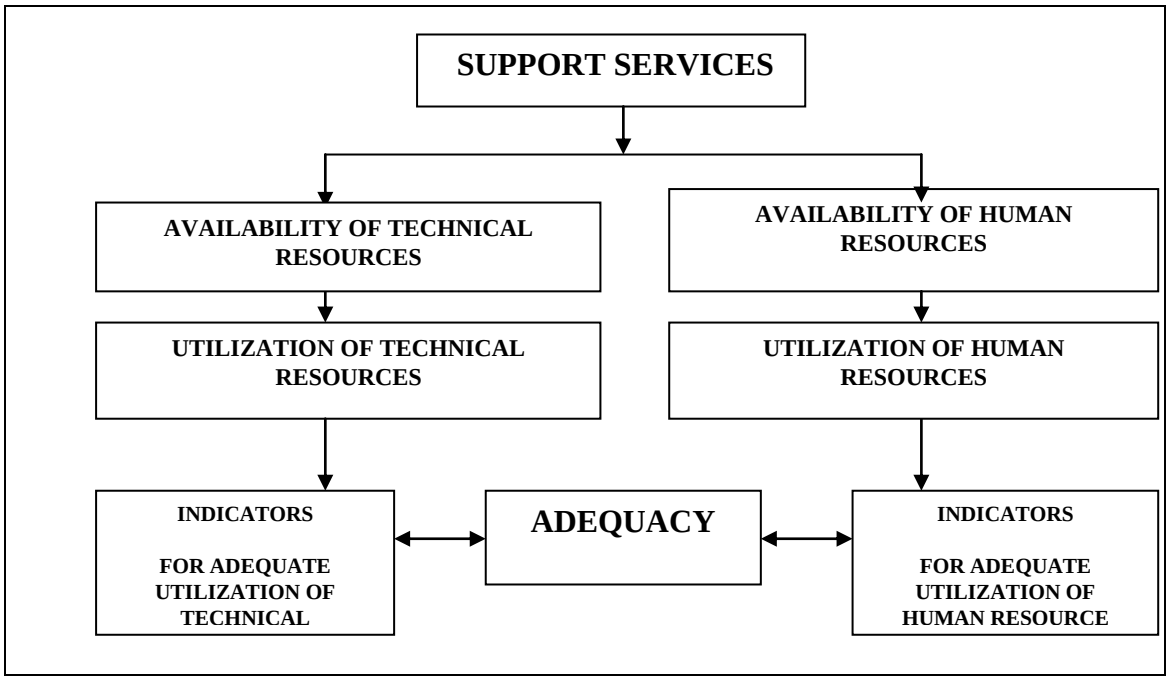

Figure 1.3: Model of Analyzing Human and Technical Resources for Students with Visual Impairments

Source: Reigeluth, 1999 In Maguire & Matejka, (1999:5)

This study was grounded on the modified Conceptual Framework from Reigeluth, (1999) cited by Maguire and Matejka (1999) in their study of '*On-line delivery: A model for successful implementation,* a paper which was presented to AARE-NZARE Conference 1999 Melbourne, Australia.

With reference to the above illustrative model, support services and adequacy were the two main key words in this study. Support service in the first instance refers to an activity or function required for successful completion of a process, program, or project (Webfinance, inc. 2013). On the context of this study, support service referred to availability and utilization of a technical resource and human resource that harmonize day to day academic pursuits of learners with visual impairment at a higher learning institution level. Adequacy on the other hand refers to a quality of being sufficient for requirements barely acceptable(Houghton Mifflin, 2009). In the context of this study, it referred to presence in due time, of appropriate and sufficient resources including technical and human resources and services which were capable of meeting all basic unique learning needs of a University student with visual impairment.

'Support services' was an independent variable focused onto two main dimensions namely: availability of technical resources and availability of human resources. The first dimension accommodated consideration on availability of technical resources which included assistive technologies and architectures. Example of these technical resources were: voice recognition systems, Zoom text screen, personal digital assistant software [PDAs], Braille embossers, voice recorders, electronic note takers, closed circuit televisions [CCTVs], Magnification system, Braille machines and typewriters. Other technical resources falling under this dimension included accessible libraries, computer labs and web pages appropriate for learners with visual impairments.

The second dimension under support services reflected the availability of human resources which comprised Braille transcribers, orientation and mobility specialists, volunteers; (e.g. live readers of the blind), assistive technology specialists, academic advisors (including lecturers) and counselors. Below these two dimensions, consideration was put on utilization of the same respectively.

Utilization of technical resources referred to services provided to students with visual impairments by making technical resources accessible to them. Example of these services included but not limited to: Braille transcription, voice recording, use of low vision aids, use of electronic note takers, use of accessible libraries, labs and web pages. Utilization of human resource on the other hand referred to services provided directly by the human resource to the student or for promoting awareness to the public with regards to issues which pertain learners with visual impairments. These services included but not limited to; live reading for the blind, tutoring on use of assistive technologies, teaching/learning strategies, guidance and counseling and public awareness initiatives.

The second key word in this study was ‘Adequacy’. This was a dependent variable in the sense that, it depended on the level of Support services offered. Indicators for adequacy of support services again felled under two dimensions namely indicators of adequate utilization of technical and indicators of adequate utilization of humanresources.In the first dimension, indicators for adequate utilization of technical resources included but not limited to the following:Percentage and nature of the required technical resources available, percentage of the scheduled volume of

Braille papers used weekly and percentage of the available links accessible to learners with visual impairments.

In the case of the second dimension, indicators for adequate utilization of human resources included but not limited to the following: Staff : student ratio, number of trainee on assistive technology per number of students with visual impairments, the percentage of students with visual impairments able to use assistive technology, number of hours spent on live reading per the total number of official hours and number of cases attended per number of cases supposed to be attended in a week.

A researcher adopted ideas of establishing indicators for the level of service delivery from -WHO, (2008) and from Humplick & paterson, (1994) in their presentations made at different occasions and time. A detailed description of indicators of adequacy for technical and human resources as well as that for services was presented in (Appendix i).

1.1.5 Types and Levels of Services for Students with Visual Impairments

Kouroupetroglou, Pino and Kacorri, (2011) assert that, 'Providing effective academic services for students with disabilities demands among others thorough planning, appropriate organizational scheme, human resources with specific expertise, advanced technological support, considerable implementation effort and functional evaluation'. The perfect model of practices may be difficult to achieve, even worldwide. One of the ideal examples of practices however, may be drawn from a model of accessibility services provision for students with disabilities in

higher education. This model was first successfully applied in the accessibility unit for students with disabilities in the University of Athens in Hellas.

According to this model of accessibility service provision, and with a focus to the present study, services are categorized into three groups namely; services addressed directly to a student (level 1), services indirectly addressed to a student (level 2) and services promoting accessibility (level 3).

1.1.5.1 Level one Services: Service Addressed directly to a Student.

These services directly deal with specific requirements of students with disabilities and they include; Student's needs recording service, Abilities evaluation service, Personal assistive technologies service, accessible educational material service, Psychological counseling service and volunteerism service.

1.1.5.2 Level two Services: Services Indirectly Addressed to a Student.

These services are related to adjustment made on the academic environment that are required to improve accessibility and they include: building accessibility service (e.g. placing handrails, and specific markers for people with vision loss), accessible libraries & labs service, guideline service and staff & volunteer training service.

1.1.5.3 Level Three Services: Services Promoting Accessibility

These services intend to disseminate good practices and reach more people in the community and they include: Web accessibility evaluation service, event service

(e.g. meetings, press conferences and training camps), know how dissemination service (e.g. organizing/participating in workshops and seminars that concern issues of students with disabilities) and research service (Kouroupetroglou, et al. (2011).

1.2 Statement of the Problem

A brief trace made above for the education of people with visual impairments in Tanzania has shown that a significant effort has taken place to boost their education at primary and secondary level but little at higher learning institutions (URT, 2006). Literature and experiences have acknowledged that, lack of specialized equipment and teaching or learning materials; insufficient specialist teachers for special needs education, limited education opportunities are common problems in the provision of education to student with visual impairment in Tanzania. The situation is even worse at higher learning institutions. Availability and adequacy in aspects such as adapted technology, human resource, accessibilities of technical infrastructures like libraries, computer labs, internet web pages and the like needed to be examined at this context.

The question was; are these aspects in consideration available, in what quantity and quality? Either, another question to be asked was, 'How much are the non-technical staffs in universities knowledgeable about special education needs of students with visual impairments?' Further, it was the concern of this study to investigate the availability, the quality and the quantity of appropriate services offered by the live readers, technical and non-technical staffs to students with visual impairments. These services in consideration included but not limited to Braille transcription, live reading, electronically note taking, adapted technology tutoring, font adjustments

and voice recordings. Other considerations were teaching and learning strategies such as; tests/exams' arrangements, use of board, question framings, preparation and use of accessible teaching/learning aids and the like. It was important therefore that, a study be carried out to examine the extent of satisfaction within students with visual impairments through the support services they received from service providers in high education institutions of Tanzania.

1.3 Purpose and Objectives of the Study

1.3.1 Purpose

The purpose of this study was to investigate the availability and adequacy of support services, including assistive technologies to students with visual impairment in Tanzania higher learning institutions.

1.3.2 Specific Objectives of the Study

The specific objectives of the study were to:

1. Assess the availability of human resources for students with visual impairment in institutions of higher learning during the first decade of the 21st century.
2. Find out the types and sufficiency of the available technical resources provided to students with visual impairments in higher learning institutions in Tanzania during the first decade of the 21st century.
3. Examine the level of utilization of the available technical and human resources

4. Assess the quality of human and technical resources as well as support services, for students with visual impairments

1.4 Research Tasks and Questions.

According to Omari, (2011:40), a researchable question should have some sort of information that can be collected to answer it. The following research tasks guided the study;

Task one. Determine the number and the quality of the human resource for students with visual impairments in higher learning institutions during the first decade of the 21st century;

Questions:

i. How many persons are dedicated to providing services for students with visual impairments in this university?
ii. Are there any other members of staff in this university who serve students with visual impairments in their academic endeavors? Briefly explain.

Task two. Finding out if the correct technical support is available and sufficient to students with visual impairments in higher learning institutions in Tanzania;

Questions**:**

i. What type of technical resources is available to students with visual impairments in this University?
ii. How sufficient are the resources in (i) above?

Task three. Examining the level of utilization of the available technical and humanresources for students with visual impairments;

Questions:

i. How fully utilized are the specialized human resources?

ii. How fully utilized are technical resources available?

Task four. Assess the quality of human and technical resources as well as support services, for students with visual impairments;

i. What is the level of education does each of the available human resource has?

ii. What level of training has each of the available human resource has undergone?

iii. How long does it require for a student with visual impairment to prepare the recorded lecture materials in accessible format?

iv. How timely are the support services provided to students with visual impairments?

1.5 Conceptual Framework of the Study

Conceptual framework of this study was grounded on the Context, Input, Process and Product [CIPP] model formerly propounded by Daniel L. Stufflebeam. The CIPP model is a comprehensive framework for guiding formative and summative evaluations of projects, programs, personnel, products, institutions, and systems (Stufflebeam, 2003).

According to this model, Context evaluations assess needs, problems, assets, and opportunities to help decision makers define goals and priorities. Input evaluations assess alternative approaches, competing action plans, staffing plans, and budgets for their feasibility and potential cost-effectiveness to meet targeted needs and achieve goals. Process evaluation assess the implementation of plans to help staff carry out activities and later help the broad group of users judge program performance and interpret outcomes. Product evaluations identify and assess outcomes – intended and unintended, short term and long term both to help a staff keep an enterprise focused on achieving important outcomes (Stufflebeam, 2003).The figure below displays the core components of the CIPP model in reflection to the realities in the current study.

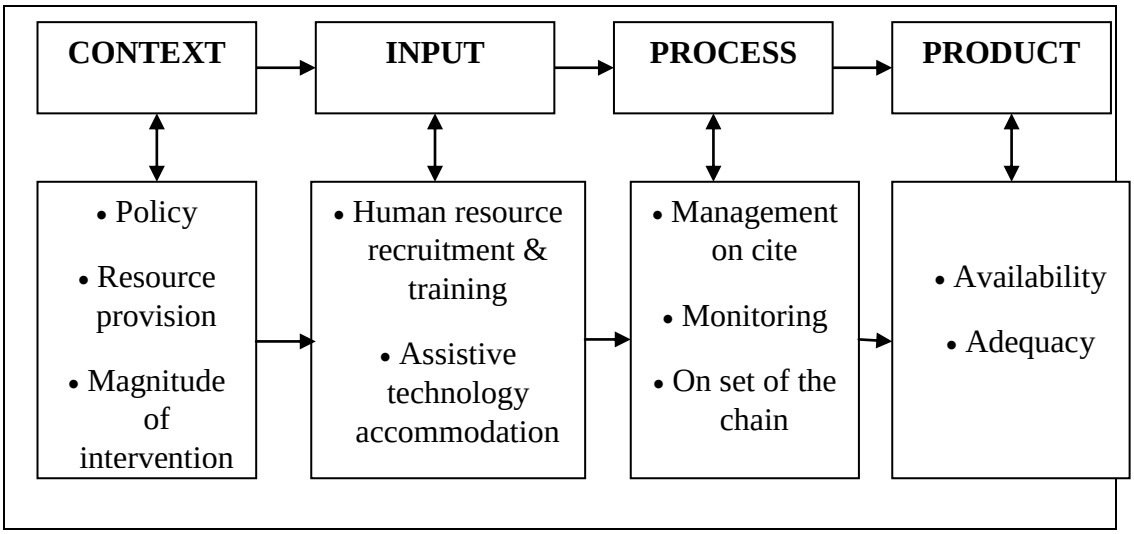

Figure 1.4: The Application of the Cipp Conceptual Frame

Source: Stufflebeam, (2003)

At formative level of the context evaluation component of the CIPP model, this study examined the possible needs, problems and opportunities persisting within

the target institutions in respect to support services provided to students with visual impairments. These possible needs, problems and opportunities to be examined in particular included; policy, resources provision and magnitude of the provisions in favor of students with visual impairments. Decision makers here ought to ask themselves; 'What needs to be done?'

With reference to the Input evaluation component, focus was on assessing whether the target institutions had concrete work plans, whether specific budgets were set, whether human resource recruitment & training as well as accommodation of technical resources in work plans took place in favor of students with visual impairments. Here, the question was; 'How should it be done?'

With reference to process evaluation on the other side, focus was based on assessing the implementation of the set plans as stipulated in input evaluation above. This evaluation addressed the question; 'Is it being done as planned?' which decision makers in target institutions ought to ask themselves. The researcher here was interested in getting information on whether the target institutions had a monitoring system to ensure that the institutional management and technical resource at all levels executed its responsibilities satisfactorily as planned in favor of students with visual impairments. Finally, in respect to product evaluation, the focus based on identifying and assessing the outcomes; the intended outcomes being the availability and adequacy of support services to students with visual impairments. The question here was; 'Is it succeeding?'

At summative level of context, input, process and product evaluation, the researcher required additional appropriate information to address the following retrospective questions; ‘Were important needs addressed?’, ‘Was the effort guided by a defensible plan and budget?’ ‘Was the service design executed competently and modified as needed?’ and ‘Did the effort succeed?’ (Stufflebeam, 2003:2-3).

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter reviews the literature related to the study. In addressing objective one of the study, literature related to availability of human resources was presented. In addressing objective two, literature related to availability and sufficiency of technical resources were presented. Literature to address objective three of this study focused on the level of utilization of human and technical resources. Finally, in addressing objective four of this study, concentration was to examine the literature about the quality of human and technical resources as well as the quality of support services for target students. Finally, synthesis of the knowledge gap wound up the discussion in this chapter.

2.1 Categories and availability of Human Resource

Human resource according to the current study can be categorized into two broad groups namely; technical staff and non-technical staff. Literally technical staff, sometimes called specialist refers to a group of people who are reliable to build and maintain any type of equipment anywhere, any time and who are valuable enough to be employed on a full time paid work basis (Answers Corporation, 2012). On the context of this study, it referred to specialist teachers in the field of visual impairments (that is; Transcribers, Orientation and Mobility professionals) and assistive technology professionals. Non-technical staff refers to a member of staff that is not skilled in applied arts and sciences or on technical aspects of a job (Princeton University, 2003-2012b). In the context of this study, it referred to all

University lecturers at all levels, administrative staff linked directly to academic matters and live readers of students with visual impairments. A live reader is a person such as a peer, parent or teaching assistant who reads to a blind student (ME, 2008).In this study, it referred to a person who conducts live reading of sighted print for the blind student. This person might also do other additional tasks like searching learning materials from the internet for the blind student and guiding him/her to less familiar premises around the university campus.

2.1.1 Availability of Human Resource

Availability of human resource to provide support services to students with visual impairment is still a big challenge around the world. The United States for example, produces only about 250 new educational personnel in visual disabilities every year, although the annual demand by 2010 was estimated at 10,000new teachers and an equal number of orientation and mobility specialists (Ferrel, 2007:6). 'When so few new teachers are produced, teacher's quality becomes less of an issue than teacher quantity' (Ferrel, 2007). At the University of Western cape, South Africa, One specialist, (the Manager) one administrative assistant and 12 undergraduate student assistants serve a total of 20 students with visual impairments (Department of Education, 2009). In addition, Corn, & Spungin, (2003:11) contends that, some of the 36 programs preparing TVIs do not have a single full time equivalent employee (FTE). Some do not have a faculty member with expertise in visual impairments and blindness; instead, a faculty member coordinates the program.

Insufficient specialist teachers for special needs education in Tanzania are listed as one of the problems that special education provision faces (URT, 2006:22). Teacher training in Tanzania to deal with disabled children is minimal and most teachers in rural areas have no training at all in this area (UNDP, 2000:7). One of the findings by the study of the United Nations Children Fund(UNICEF) on state of the disabled in Tanzania in 1998, as stated in UNDP, (2000) was that, the student-teacher ratios are three times higher than the WHO standard for disabled children.

Moreover, in the Tanzania human development report: The state of progress in human resource development 1999, issued by UNDP (2000) for example, recommended that; 'the Ministry of Education should raise the profile of disabled children by including statistics on them in their various publications' (pp.7-8). Even in its strategic objective 2 (improved equitable access and coordination of student admission), the Tanzania Commission for Universities (TCU): Rolling strategic plan 2009/10-2013/14 remains silent on students with disabilities (TCU, 2009:25). To a lesser extent however, literature on support services to students with disabilities (visual impairment in particular), is found in the study of Mnyanyi, Bakari, and Mbwete, (n.d:5,7); in which they established that, there is a big challenge in both acquisition and skill training on use of equipment to students with visual impairment. Yet still, Correspondent, (2011:3); Mnyanyi, et al (n.d) noted that, currently there have been some developments on skills training through involvement of TEA and DAAT. On ground of this experience, the present study was justifiable.

2.1.2 Training and Recruitment Strategies of Human Resource

The American Foundation for the Blind, (2000), contends that, While seven (20%) of the states indicated that there was no training occurring in their states, the following were major strategies used for recruitment of transcribers: Teacher/aide recruitment by school district, Word of mouth, Newspaper ads, Feature article in newspaper and Recruited by other Braillists. Mason et al., (2000), cited byCorn, & Spungin, (2003:17), asserts that, '1,300 O&M specialists are practicing in the U.S., and university programs have produced on average 93 newly certified O&M specialists annually'. Although the national disability policy of Tanzania directs that, 'the government shall take measures to ensure that personnel involved in service delivery to people with disabilities receive professional training', URT, 2007), literature further contends that, strategies to improve human development for the disabled could be furthered if their needs were given more prominence and better data were available on which development planning could be based (UNDP, 2000:8). This signifies that, there is limited data in Tanzania on human resource development for providing services to students with visual impairments. In the succeeding few paragraphs,the availability of technical resources in higher learning institutions for students with visual impairments will be the subject of concern.

2.2 Categories and Availability of Technical Resources

With reference to the model of accessibility services discussed earlier (section 1.1.5), Categories of technical resources reflect the assistive technologies and other technical infrastructures of the immediate environment of the learner with visual impairments.

The American Foundation for the Blind's Assistive Technology webpage presents the following types of assistive technology for learners with visual impairments:

> "First, software that runs on off-the-shelf computers that can speak or magnify text in word processing programs, web browsers, e-mail programs, or other applications. One example is the Zoom Text Screen Magnification System. It is a software program that magnifies images on the computer screen. Second, personal digital assistants and electronic book players that is designed specifically for the blind or visually impaired. For example, Bookworm is a portable Braille reading device that is about the size of a Walkman. It can be used to read books and periodicals. Third, optical character recognition systems that scan printed material and speak the text. For example, the Cicero Text Reader scans printed text and turns it into speech or Braille. Fourth, Braille embossers that turn text files into hard-copy Braille. An example is the Index basic D Embosser. Fifth, Braille displays which provide access to information on a computer screen in Braille. For example, the Braille Wave is a Braille reader that plugs into a laptop computer. Notes stored on the Braille Wave can be stored in Word and transferred to a personal computer". (Cheifetz, C. & Hayenga, T., n. d. para 4).

Other technical infrastructures in consideration include but not limited to; accessible webpages, talking lifts, railed stairs, pavement, and specific markers around the university campus. Harrison, (2009:137) in his article entitled 'Evaluation of Provision and Support for disabled students in higher education, areport to HEFCE

and HEFCW by the Centre for disability studies and school of sociology and social policy at the University of Leeds' argues that, one way of improving higher education institutions sites for students, staff and visitors might be to add more electronically controlled aids and enhancements. He describes one such technical infrastructure, called 'react' as the system which deploys voice messages when activated/triggered by a device carried by the student. 'Speaking equipment is located at selected key locations, to provide information about the main campus site, and can assist students with visual impairments in particular'.

2.2.1 Availability of Technical Resources

The study carried out by Booker, Obert, & Arthur, (n.d:29), in Zimbabwe higher learning institutions revealed that, the majority of the lecturers (80%) were of the idea that provision of learning materials was not enough for student with disabilities. Jameel (2008) argues that; 'One of the three components of the Higher Education for Persons with Special Needs (Persons with disability) (HEPSN) 1999-2000 was to; improve the accessibility of these institutions by making their infrastructure and architecture more disabled-friendly'.Interestingly, several studies on attrition, particularly in Web-based courses, have found that a major obstacle for distance learners is the difficulty in accessing online materials (Hricko, 2000). There are several crucial barriers however which limit the link between student and technology: these include; financial burdens and limited availability of assistive technology, abandonment of the assistive technology following purchase and training needs (Shipp, (2008 p. 46). These barriers need to be addressed as soon as the appropriate assistive technology is identified for the learner.

2.2.2 Strategies to Address Limitations Associated with Technical Resources

Strategies to address the limitations may take different forms including; increasing budgets to meet costs, introduction of training programs to users of thesetechnical devices and amending or improving policies that govern service provisions. In England and Wales for example, there is a scheme known as Disabled student allowance (DSA's). 'DSA's are grants to help toward meeting the additional studying costs or expenses that students face as a direct result of a disability or specific learning difficulty' (Tahir, (2010). In India, policy amendment was made in such a way that, the tenth Plan advocated the introduction of a 'Component Plan for the Disabled' in the budget of various Ministries/ Departments. 'Among other things, this component required these ministries to set budgets which could serve the purpose of acquiringSpecial Equipment and scholarships to increase Educational Services for Students with disabilities' (Jameel, 2008:11).

Additional strategic example is provided by Shipp, (2008:46) who contends that, 'Once assistive technology needs have been identified, it is imperative that the student be properly trained in the use of the device(s)'.Cheifetz,& Hayenga, (n. d.) on their side advocate that, assistive technology that is worn out or outgrown should be replaced. If the equipment is not meeting the student's needs, it should be modified, replaced, or abandoned, either temporarily or permanently (para 8).A thoroughly implementation of these strategies may render better provision of support services to be discussed shortly, for the target students.

2.3 Categories and Availability of Support Services

Support services for students with visual impairments can be categorized according to Kouroupetroglou, et al.(2011:2-5) into three groups namely; accessibility services addressed directly to the student, accessibly services applied to the student's environment and accessibility promoting services. Moreover, Naidoo (2005) contends that 'Some of the programmes and services rendered to the students with a visual impainnent (sic) include the following: taping service, brailing service, reading assistance, note taking, computer training and access, faculty and library liaison, mobility training, volunteer training, pre-admission campus visits, bursary liaison, priority residence accommodation and specialized orientation to campus'.

2.3.1 Availability of Support Services.

Support services to students with visual impairments in higher education institutions have been provided in many higher learning institutions but at a varying degree of efficiency and comprehensiveness. Research has shown that, these services around the world are still a big challenge. In most cases, these services have been provided at a learner's dissatisfaction level. Using the words of Senge and Dote-Kwan (1995) cited by Perkins, (2001) for example, they 'surveyed 18 public universities in California and found that a majority of the universities took from 2-6 days to provide basic instructional materials in Braille, electronic text or audiotapes'. They still contend that, 'five of the institutions required more than seven days and 11 reported that electronic texts were not available. This leaves a gap between what legislation requires and what is being provided to students with disabilities' (Senge,

& Dote-Kwan, (1998) cited by Perkins, 2001)

‘At the International Conference on Disability in Higher Education, 50 delegates from 15 countries compared the services that were being provided, and how they were delivered, at their respective colleges and universities’ (Aune, 1993 cited by Perkins, 2001). He still asserts that, many countries offer some sort of accommodation to students, including extended time for exams, oral exams and the use of a scribe .

Provision of assistive technology to students for example, was accomplished in different ways. ‘At the University of Central Lancashire in the United Kingdom, equipment was loaned to students. At Lincoln University in New Zealand and the University of Innsbruck, Austria, the institutions were responsible for providing equipment’ (Perkins, 2001). Volunteers are also used extensively at some universities. The University of Alberta, Canada for example, uses 300 volunteers to help 200 students with disabilities. York University in Canada has a similar volunteer program (Aune, 1993 as cited by Perkins, 2001). The University of Southern California's web site specifies who qualifies for services, lists the services they provide, and the available technical and academic accommodations to be provided. Other colleges and universities have similar web sites (USC, 1999 as cited by Perkins, 2001).

2.3.2 Strategies to Address Limitations Associated with Support Services

The key limitations in support services provisions include; unfavorable policies, running costs of support services programs and limited public awareness on issues of learners with visual impairments. Clear strategies are thus needed to address these limitations. In addressing the limitation of unfavorable policies and limited public awareness, United States requires all institutions that received federal funding (virtually all colleges and universities) make their programs accessible to all people with disabilities to continue receiving that funding (Senge & Dote-Kwan, 1998 as cited by Perkins, 2001). In Uganda, the government university admission policies enable students with visual impairment to access higher education facilities and compete favorably with the other citizens (students) by according an applicant with disability additional 4 points and for a female applicant is accorded furthermore 1.5 points free. (Rukundo, 2010). Moreover, Scadden, (1997) cited byPerkins, 2001) as contending that, “Realization that blind users were not able to access a great deal of available information has prompted the principles of "universal design". Universal design means that the initial product is already accessible to all individuals, i.e., it does not need adaptations for individuals with disabilities (Perkins, 2001). The cited policies above indirectly address the limitation of running costs of the programs.

2.3.3 Indicators of Adequacy of Human Resources

Availability of a resource, whether human or technical, is one thing, but adequacy is another thing altogether. Indicators of adequacy may take a different form depending on the nature of the study objectives and content. The study by WHO,

(2008:9), on Toolkit on monitoring health systems strengthening service delivery cites numerous service delivery indicators. Indicator for service capacity in terms of human resource is termed as 'number of qualified staff according national guidelines per total number of staffing'. Either, a similar indicator is cited as; 'the proportional of health workers present on the day of assessment' (WHO, 2008). The study by the Department of Social Development, Department of Women, Children and People with Disabilities &UNICEF (2012:45), on Children with Disabilities in South Africa: A Situation Analysis Republic of South Africa, tabulated indicators on inclusive education for special schools, full service schools and ordinary schools by providing relative available numbers of teaching and support staff in the respective schools.

2.3.4 Indicators of Adequacy of Technical Resources

Zabala., (2004:9,45) in her study on the development and evaluation of quality indicators for assistive technology services cites one quality indicator as; 'The education agency has clearly defined and broadly disseminated policies and proceduresfor providing effective assistive technology devices and services'. Either, the indicator for service capacity: general, is cited as; 'the number of facilities with basic service capacity standards per the total number of facilities. The study by the Department of Social Development, Department of Women, Children and People with Disabilities &UNICEF (2012:45), on Children with Disabilities in South Africa: A Situation Analysis Republic of South Africa, tabulated indicators on inclusive education for special schools, full service schools and ordinary schools by providing relative available numbers of facilities in the respective schools.

DSD, DWCPD & UNICEF (2012)

2.4 Level of Utilization of Resources

Adequacy of utilization of resources is measured through services which are provided. There may thus be adequacy of services that are provided through human resource and adequacy of services that are provided through technical resources.

2.5.1services Provided through Human Resource

In the context of this study and in connection with the model of accessibility services provision for students with disabilities in higher education of which this study refers to, the services provided through human resource include; Students needs recording service (SNRS), Abilities evaluation services (AES), accessibility educational material service (AEMS), guideline service (GS), staff volunteer training service (SVTS), event service (ES), know how dissemination service (KHDS) and research service (RS) (Kouroupetroglou, et al. (2011:2). These services require human interventions for their accomplishment. Adequacy of a service can clearly be examined though appropriate indicators.

2.4.2 Indicators of Adequacy of Services Provided through Human Resource

Indicators of adequacy of services provided through human resource can be in different forms. The case load can be one good indicator for services provided through human resource. The study by Corn& Spungin (2003:17) on free and appropriate public education and the personnel crisis for students with visual impairments and blindness for example, states that, with regard to teacher

recommendations, the National Plan for Training Personnel to serve children with blindness and low vision (NPTP) stakeholders concurred that ‘an 8-to-1 ratio of students-to-teacher is a reasonable (although not necessarily ideal) average recommendation’. Another example of such indicators is; the ‘number of visits to health facilities for ambulant care per the total population for the same geographical area to compare the density’ (WHO, 2008:13). Time is a vital component in service provision. Adequacy of service provision thus includes how timely the service is provided. One of the sample indicators that WHO, (2008:14) cites includes; the % of emergency department visits who left without being seen (record review)’.

2.4.3 Services Provided through Technical Resources

Kouroupetroglou, et al. (201:2,3) cites personal assistive technologies service and web accessibility evaluation service (WAES) as part of other services. Although all services have a component of human resource involvement, these two, PATS and WAES are oriented to direct student involvement. Once the human resource offers the infrastructure and the appropriate tools needed for testing and assessing a wide variety of assistive technologies to the student and other necessary interventions are done for example, the student is left alone to make use of the assistive technology or facility for the rest of time.

2.4.4 Indicators of Adequacy of Services Provided through Technical Resource

The study by WHO, (2008:7,8), cited an indicator of service availability as; ‘the number of health facilities per the total populations for the same geographical area’. The indicator for distribution of in-patient beds per 10,000 populations is termed as;

‘the number of in-patients beds per the total population for the same geographical area’. The common feature of these two examples is that the indicator show the relationship or proportionality of assistive device or facility to the number of user of that facility. There are times when indicator of adequacy may rely on perceptions of the service user. One university student with visual impairments under the survey, which was conducted to gain the students’ perspective on services provided, was asked among numerous questions the following and the replies thereof;

‘1. Were these services adequate?

No. I’ve had to come up with many of my own solutions to read textbooks, handle course requirements, etc. Handling things on your own is a good thing to some extent, but other disabled students who may not have my technical skills will have considerable problems (Perkins, 2001).

2. Were these services provided in a timely manner?

No. I have had to constantly annoy people and complain to countless others in order to get many things accomplished’ (Perkins, 2001).

The percentages of similar responses of that kind from respondents may be an indicator of adequacy of the service in question.

2.5 Quality of Resources and Services

Quality is a degree of excellence (Merriam-Webster Incorporated [MWI], 2014). On the context of this study, this definition can apply well on considering the quality of human resources. Alternatively, MWI, (2014) defines quality as the superiority of the kind. Contextually, this definition can apply well when

considering technical resources and support services for students with visual impairments.

2.5.1 Quality of Human Resources for Students with Visual Impairments

Quality is a degree of excellence (Merriam-Webster Incorporated [MWI], 2014). In the context of this study, quality of a human resource is the level of proficiency or advancement of knowledge or skills in a given field of study drawn from training and experience. Every country has got its own priorities in production of specialist personnel. In Cyprus, very few trained staff were employed despite the Cypriot special education law stressing the need for staff training and qualification (Hadjikakou, & Hartas, 2007:7). Either, they contend that, there were not any criteria for assessment/identification agreed upon, with the majority of staff having limited training and expertise on disability issues. (p. 26).A recent national survey conducted by Blankenship, (2004:15) found that 'most states (n = 16) responded that *highly qualified* teachers and effective instruction had not been identified for students with visual impairments'.

Every country has got its own standards for getting qualified personnel. Thirteen (35.1%) of the respondents indicated their state has standards for transcribers including exams, course completion, and/or certification (AFB, 2000). 'The Academy for Certification of Vision Rehabilitation and Educational Professionals (ACVREP) offers national certification to Orientation and Mobility specialists (O&Ms) who have taken courses at approved university preparation programs and submitted their transcripts (Corn & Spungin, 2003:14),'. Association of Education

and Rehabilitation (AER) approves programs in orientation and mobility as well as programs in Teachers of students with Visual Impairments (TVI). In a survey carried on by the AFB, (2000) on the training and availability of braille Transcribers in United State, it was noted that, there was a distribution of Certified and uncertified Transcribers per state as shown in Table 2.1 below.

Table 2.1: Number of Employed and Volunteer, Certified and Uncertified Braille Transcribers in United States.

Category of Transcriber	**Average Certified Transcribers Per State**	**Average Uncertified Transcribers Per State**
Employed, full time	5.9	8.1
Employed, part time	1.6	4.5
Volunteer, full time	8.4	5.2
Volunteer, part time	7.5	1.5
Contract, by the project (employed)	5.6	0.8
Contract by the project (volunteer)	8.8	0.4

Source. AFB, (2000 p. 9)

The national disability policy document of Tanzania simply acknowledges the importance of having quality teachers of students with visual impairments by prescribing training of professionals in the fields of persons with disabilities (URT 2006:22). The challenge of quality does not end to human resource, but also to

technical resources provided to students with visual impairments to be discussed shortly.

2.5.2 Quality of Technical Resources for Students with Visual Impairments

An alternative definition of quality by MWI, (2014) is superiority in kind. Quality of assistive technologies for the students with visual impairments has developed over years. In the past, low quality assistive technologies were involved in teaching and learning strategies of a student with visual impairments. Historically for example, talking books which were in form of tapes, played on recorders, were used to let a learner access hardcopies of learning materials.Talking books in that form, rendered limitations to the learner with vision loss by consuming him/her so much time in preparing summary notes in braille format. It was difficult to trace a specific point within the recorded materials and hard copies had to be prepared manually the task which was time consuming. ‘As advances in technology improved, these developed into electronic books (e-books) and digital talking textbooks’ (Coard, 2002; Philips, 2007 cited by Hussin, (2013:17). With these new technologies, a user could use specific buttons on the device to access specific sections, pages and even words within a document. In so doing wastage of time was minimized very significantly.

In the past, it was a challenge for students with visual impairments to access ordinary print even if the learner was in the category of low vision. Low quality devices such as slates, stylus A4 frames and manual braille machines, as well as magnifying lenses were used to access print materials in braille format. Today,

students with visual challenges can utilize enlarged print or screen reading software on the computer. ‘Machines are available to enlarge any printed materials, to convert printed material to Braille, or to convert printed materials into a synthesized voice’ (Teaching strategies (n.d.:4). If the system like an institution of higher learning has quality human resources and quality technical resources for students with visual impairments, quality support services to be discussed shortly are likely to manifest in that system.

2.5.3 Quality of Support Services for Students with Visual Impairments

Qualities of support services require existence of agreed standards. Every country may adopt a specific set of guidelines or standards for support services provision which suit her students with visual impairments. Some common features however may exist which can be considered appropriate across nations. One example of a set of such guidelines is provided by Waterfield, & West, (2005:1) in their article entitled ‘Meeting the specific requirements of Blind and Partially Sighted Students studying in Higher Education in the UK’.In this article, they summarize guidelines to support academic staff to help meet the anticipatory and positive duties under the Discrimination disability act, - DDA, 2005 of UK. These guidelines in short include; Understanding of the learning needs of a student with visualimpairments, a coordinated approach, provision of Accessible teaching and learning materials, arrangements for assessments, and support provision: that is, technical support, student enablers, buddies or mentors, and the disabled student’ allowance.

Another example of a set of guidelines for support services provision is provided by the Texas Education Agency, (2014) in the article entitled ‘educating students with visual impairments in Texas: Guideline and Standards. This article identifies the following guidelines:

First, ‘Eligibility is determined by an individualized family service plan’

Second, ‘Vision professionals provide expertise specific to visual impairments prior to and during the full and individual evaluation’

Third, ‘Evaluations of all areas of the expanded core curriculum are used to determine individual student programs’

Fourth, appropriate instructional time, accommodations, and modifications are provided to meet all identified areas in individual student programs’

Fifth, ‘Certified teachers of students with visual impairments perform required evaluations and instruction’

Sixth, ‘Certified orientation and mobility specialists perform required evaluations and instruction in orientation and mobility’

Seventh, written job descriptions identify comprehensive roles of paraeducators

Eighth, ‘Families are active members of the educational team’

Ninth, ‘Vision professionals are members of the instructional team’

Tenth, ‘A continuum of services and placement options are available based on individual student needs’

Eleventh, ‘Times for specialized instruction by certified teachers of students with visual impairments and by certified orientation and mobility specialists are supported by appropriate evaluation in all areas of the expanded core

curriculum for each student'

Twelfth, 'Written caseload guidelines are used to evaluate caseloads of vision professionals' (Texas Education Agency, 2014).

Both examples above have common features which include; a requirement to identify the learner with special needs, to know the special needs of a learner, to provide appropriate support services and a coordinated approach, the point which is more elaborate in the second example.

With the above cited guiding ideas in mind, practical examples of relatively quality support services can be noted from several countries worldwide. In some of western countries for example, much has been done in connection to support services provisions for students with visual impairments in higher learning institutions. Koganuramath & Choukimath, (2009:620) in their study on learning resource centre for the visually impaired students in the universities to foster inclusive education, contend that, 'Developed countries like USA, Canada, UK and many European nations have started their initiatives to facilitate the persons with disabilities (PWD) much before'. Either, Hadjikakou, & Hartas, (2007:4,5), in their survey on higher Education provision for students with disabilities in Cyprus evidences this assertion when they contend that, 'Numerous governmental initiatives in many western counties have implemented non-discriminatory practices through changes in educational policy and practice by making adjustments and widening access to higher education'. They still stress that, 'students with disabilities and their tutors generally negotiate teaching modifications and concessions with assignments and

exams including extra time for test/assignments, extended due dates, scribes and readers…'. The University of Athens in Greece of which the current study refers to, provides support services to students with visual impairments which are relatively in a quality level. The accessibility unit is well coordinated, well equipped with necessary technical facilities and the organization structure is participatory (Kouroupetroglou et al, 2011).

The above citations suffice to provide a picture that, despite many challenges associated with education of students with visual impairments, there is some sort of developments worldwide to rectify the situation. Harrison, et al, (2009:vii), argues that 'There is some form of dedicated support service provided for disabled students across institutions in general, although there is a mixture of approaches'. With all issues discussed in this chapter in mind, it is worthwhile here to synthesize the literature review and grasp the knowledge gap thereof.

2.6 Synthesis And Knowledge Gap

Literature review has strongly supported that the problem of inadequate support services to students with disabilities in higher education is very big throughout the world (Kouroupetroglou, et al. 2011). The problem cuts across all education systems like traditional higher education and open and distance education systems. Most of these studies however, have concentrated and directed their focus on a wider spectrum of disabilities rather than focusing on a specific one category of disability, say visual impairment for the current study [Hadjikakou, and Hartas, 2007], [UNESCO, 1995] and [Kouroupetroglou, et al. 2011]. Results from these

studies might depict a general picture of affairs but might omit some of the basic features of experiences since every category of disabilities differs significantly in some areas of their impacts to the individual's learning.

Ndume, et al. (2008), have concentrated their study on acceptance of eLearning, analysing the challenges of eLearning and designing an assistive tool for people with disability at higher learning institutions in Tanzania. Their study not only focused on a wider spectrum of disability, but also addressed a specific provision (accessibility to eLearning) rather than different provisions to a learner.

Perkins, (2001), in his study had attempted to find an efficient way to deliver services to students with visual disabilities and to help pre-service and in-service teachers to incorporate assistive technology into their teaching and curricula. This study was carried out at the University of Charleston in United States. The results of the study were based mostly on experiences from developed countries and might have been influenced by the level of development, technology, culture and other factors in those countries. In addition to that, while Perkins, (2001) studied on the efficient way to deliver services, the current study focuses onto the level, degree or adequacy of support services offered to students with visual impairments in Tanzania higher learning institutions. It is worthwhile therefore, to conduct the current study as no other researchers in Tanzania or elsewhere have done it.

CHAPTER THREE

3.0 METHODOLOGY OF THE STUDY

This chapter describes the research methods which were employed in the study. It comprises research paradigm, research design, geographical area of the study, population of the study, in which sample, sample size and sampling procedures are discussed. Also data collection methods which comprise; check list, interview schemes and focused group discussion will be addressed. Ethical issues consideration will wind up chapter three.

3.1 Research Paradigm

There are mainly two research approaches, quantitative and qualitative paradigms (Opie, 2007). This study employed research attributes from both quantitative and qualitative paradigms.It was considered that, it was necessary to expand the scope of the study so as to capture method-linked dimensions like quantity, quality, sufficiency, perceptions and different diversities associated to the current study (Sandelowski, (20002:247). Omary, (2011:54) contends that, 'careful search will show a great room for the manner and modality of collaboration of the approaches so as to get better picture of any phenomenon under microscope'. Parallel to this, Borg and Gall (1989) cited by Lusekelo, (2009:36) comment that, in many cases the combination of the two approaches is superior to either one. However, for the purpose of this study the qualitative approach dominated more than the quantitative one. The qualitative approach dominated because, the researcher wanted to collect in depth subjective information on individuals' opinions, views and feelings on the

persisting system of provision of support services, adequacy of these provisions to students with visual impairments in higher education institutions.

3.2 Research Design

Trompo & Kombo, (2006) cited by Lusekelo, (2009) define Research design as a strategy for data collection that seeks to describe a unit in detail by using few examples of the phenomena. For the purpose of this study, the researcher employed a survey design. According to Scheuren, (2004), a survey design is a method of gathering information from a sample of individuals. The current study fitted to this design because sampled Universities that accommodate students with visual impairments in Tanzania were the target group from whom relevant information would be fetched.

This research design was used for data collection and analysis from four universities that accommodate students with visual impairments in Tanzania. The design enabled the researcher to describe the 'adequacy' status of support services to students with visual impairments in detail by using only a small selected sample size from the context of the geographical setting of the study area (Lusekelo, 2009). The main concentration was to collect data for making future plans or decisions (Omary, 2011:97).

3.3 Geographical Area of the Study

The study was carried out in the regions of Dar es Salaam, Tanga and Dodoma with specific concern on the Kinondoni, Lushoto and Dodoma municipal and districts

respectively. The reason why this area was chosen is the fact that, these are the regions and districts in particular whereby the sampled Universities are located.

The Universities in consideration were chosen due to the fact that they were the ones which accommodate most of the students with visual impairments. Moreover, it was assumed that most of the information related to the current study would be available within these Universities. University of Dar es salaam -UDSMfor example, it is the oldest of all Universities in Tanzania and has been enrolling students with VI from late 1970s. Univesity of Sebastian Kolowa Memorial university -SEKOMU was the only institution in Tanzania at the time which offered special Education degrees at both undergraduate and postgraduate levels and thus was likely to attract more concern from this community of learners with visual impairments. Dar es salaam University College of Education–DUCE was incorporated as though recently established, equally accommodates a reasonable number of students with visual impairments. Finally but not least, University of Dodoma -UDOM attracted the researcher to include it in the study due to the fact that though established recently, yet it was the largest University in Tanzania at the time and was likely to have a significant number of these scholars with visual impairments.

3.4 Population of the Study

Population, according to Fraenkel & Wallen (2000), is an arrangement of people or things that a researcher has in mind from which one can obtain information and draw conclusions. In this research, the focus population involved all responsible

officials from the academic and administrative staff, information and computer technology [ICT] offices/departments of the respective Universities or campuses. Also officials and students with visual impairments from the special education units of the same Universities/campuses constituted the population. Being the main focus in this study, the estimated population of students with visual impairments within the respective institutions was presented in Table 3.2

Table 3.2: Number of Students with Visual Impairments in Universities under the Study for the Academic Year 2012/2013

INSTITUTIONS	Braille users	Large font users	**Grant total**
SEKOMU	11	2	13
UDOM	3	2	5
DUCE	4	3	7
UDSM	13	5	18
TOTAL	31	12	**43**

Source: Field research data (2013)

3.4.1 Sample and Sample Size.

A sample is a smaller group of subjects drawn from the population in which a researcher is interested in gaining information and drawing conclusions (ibid). For the sake of this study, the sample comprised of thirty seven (37) members as the Table 3.2 indicates.

Table 3.3: Composition Of The Sample And Sample Size

Category of respondents	**Number**
Officials from Administrative / Academic staff for all institutions in the sample	4
Special Education Unit management for all institutions in the sample	3
Students with visual impairment for all institutions in the sample	30
Total	**37**

Source: Field research data (2013)

3.4.2 Sampling Techniques.

Cohen, Manion, & Morris, (2000) argues that sampling is the procedure used to select some elements of a population in such a way that it represents the actual characteristics of the total population. This study adopted purposive, and random sampling procedures to select respondents.

Purposive sampling was used to select officials from all sections. Officials from Administration department for example, were purposively selected so that they might be able to provide information on management issues related to students with visual impairments. Purposive sampling was also employed to the special education staff who would provide their experiences related to support services provisions and challenges they faced during the process of service provision to students with visual impairments. Advantage of purposive sampling is that it ensures balance of group sizes when multiple groups are to be selected. One disadvantage of this procedure is

that, samples are not easily defensible as being representative of populations due to subjectivity of researcher (Black, 1999:118).

Random sampling was employed in selecting students with visual impairments. These students provided information regarding their study experiences and in particular on nature and level of support services they receive from their respective institutions.

3.5 Data Collection Methods

Multiple methods of data collection were employed in this study. Cohen et al, (2000), see the use of more than one methods helps to improve accuracy of data collected. Data capture instruments to be used in this study included; Checklist, interview and focus group discussion.

3.5.1 Checklist for Service Providers

This data capture instrument was used for service providers**.** This instrument involves getting information through documents. According to Yin, (2009), documents can provide more insights into the program being studied by cross-validating and augmenting evidence obtained from other sources. This tool is less expensive as compared to collecting data on your own. One disadvantage of this tool is that obtaining and analyzing necessary documents can be a time consuming process.This instrument was used to collect the following information from the special Education departments/units of the respective Universities/campuses: Availability and quality of human resources for students with visual impairments,

types and sufficiency of technical resources for students with visual impairments and level of utilization of available technical and human resources. The researcher provided data capture guides to the respective offices in order to gather various information. The appropriate data capture guides were presented in the (Appendices II-VI).

3.5.2 Interview Scheme for Service Administrators

Interview refers to an exchange of views between two or more people on topics of mutual interest, see the centrality of human interaction for knowledge production, and emphasize on social situation of research data (Seidman, 1991). This study employed a semi-structured interview in gathering information from almost all respondents and service administrators in particular (Cohen et al, 2000). A semi-structured interview is a qualitative method of inquiry that combines a pre-determined set of open questions with the opportunity for the interviewer to explore particular themes or responses further (Evaluation Toolbox, (2010). One advantage of this tool is that use of pre-determined questions provides uniformity in data collection. On the other hand however, its disadvantage relies on time consumption during data collection and analysis.

3.5.3 Focused Group Discussion for Students with Visual Impairments

Focused group is a small group of six to ten people led through an open discussion by a skilled moderator;the group needs to be large enough to generate rich discussion but not so large that some participants are left out (Eliot & Associates, 2005). One advantage of this instrument is that due to dynamic environment the

moderator can modify the topics which are prepared before the session to make the topic more suitable for the purpose. One disadvantage of this instrument is that if the moderator is not well competent, the session may be influenced by one or two dominant people in the group thus making the output very biased. Focus group in this study was employed in fetching information on feelings of students with visual impairments about different provisions they receive from respective universities.

The researcher organized FGD involving seven students with visual impairments in each of the two institutions where conditions for conducting a FGD were met. A discussion was conducted at institution SEKOMU and UDSM in one of rooms they usually use for reading purposes. Before the discussion began, the researcher introduced the purpose of the study to familiarize the participants. The researcher posed questions before allowing the participants to discuss them. The researcher was keen to record the responses manually on the FGD guide. There were three questions designed for discussion in the focus group (see Appendix VII).

3.6 Ethical Issues Considerations of oThe Study

Phrasisombath, (2009:18) asserts that, people who are asked to participate in a study have a right to know what it fully involves, what implications there are for them or others close to them and how it could affect them negatively or positively. On grounds of these professional ethics, the current study took consideration on the following issues: The consent of the respondents themselves in engaging and providing information without any forceful mechanism from the researcher was taken care of. Secondly, the researcher observed the right of the respondents to privacy and confidentiality of the information they provided. Moreover, the

researcher was more empathetic and considerate to student respondents during the data collection (Omary, 2011). Lastly, but not least, the researcher ensured that, unless permission was sought from a respondent, neither the names nor personal identities would be associated with the information given by the respondents. Also a letter of permission was sought from the University authorities.

CHAPTER FOUR

4.0 ANALYSIS AND PRESENTING RESULTS

This chapter analyzes and presents the findings as related to the four main objectives of the study. In the first instance, the chapter provides the data analysis plan, validation and administration of the instruments. It then analyzes and presents the results for availability of human resources as per the first objective. Secondly, it analyzes and presents results for availability and sufficiency of technical resources as per the second objective. Thirdly, analysis and presentation of results is directed to utilization and sufficiency of available human and technical resources for students with visual impairments in target higher learning institutions. Lastly, analysis and presentation of results is directed to the fourth objective which is quality of human and technical resources as well as quality of support services for students with visual impairments.

4.1 Data Analysis Plan

Qualitative data was collected through semi structured interviews schedule focused group discussions and check lists. In analyzing qualitative data, content analysis was employed in order to extract relevant information. Quantitative data was categorized and presented in tabular form and frequencies such that percentages were calculated.

4.2 Validation and Administration of the Instruments

A pilot study was carried out first in the identified areas before the main study was started. A semi structured interview was carried onto the group of four students and one administrative official at one of the target institutions. Likewise checklists were

used to collect data for technical and human resources from the special education unit officials. Later on, the data collected were processed and analyzed in relation to the study. The results from the pilot study helped the researcher to identify and clear out the ambiguities and make corrections in order to improve the interview schedules. Research clearance letter was sought from the Open University of Tanzania management. A brief introductory remark was given to all study participants before starting the task.

4.3 Availability of Human Resource

This study collected data from the four Universities; SEKOMU, UDOM, DUCE and UDSM. The categories of human resource whose availability was sought in those institutions included; Braille Transcriber, Orientation and Mobility specialist, Assistive technology specialist, Volunteer, Counsellor, Librarian for accessible library, Academic advisor and any other dedicated staff. The results indicated that, out of these eight categories of human resources, there were a total of four categories available in all institutions under the study. These categories included; the Transcriber, the volunteers, the academic advisors and other dedicated staff. The rest categories were not available in any of the four institutions. Refer Table 4.1 for detailed information.

Table 4.4: Availability of Human Resources (HR) for Students with Visual Impairment in Institutions of Higher Learning under this Study

Category of human resource	Available #	Required #	Availability %	Average human resource /institution
Transcriber [TRB]	5	9	55.55	1.25
Orient. & Mob. specialist [O&M]	0	4	0	0
Assistive technology specialist [ATS]	0	4	0	0
Volunteer [VLT]	45	45	100*	11.25
Librarian for accessible library [LAL]	0	4	0	0
Counsellor [CNL]	0	4	0	0
Academic advisor	5	4	125	1.25
Other dedicated staff [ODS]	1	unlimited	-	-
Total	55	74	74.32	13.75
Overall availability % of human resource (ODS omitted in computation for convenience)				

Source Field Data, 2013

Data collected from the four institutions as depicted in Table 4.4 indicate that technical human resource comprises of five Transcribers out of the requirement of nine such technical staff. Each institution has got at least one academic advisor the exact data of these personnel being five. Data indicate also that, there are a total number of 45 live readers for students with visual impairments in these four

institutions, unevenly distributed. As a matter of coincidence, the required number of these volunteers is supposed to be 45, assumed that each student with visual impairment would be legible for being assigned at least one live reader so as to minimize his/her academic challenges emanated by disability.

Data also was collected from interviews held with the administrative officials to examine more about availability of human resources for students with visual impairments. Issues of inclusive education and outsourcing some of the support services emerged as part of the means to combat the challenge of shortage of human resources. Failure to employ substantial number of specialized human resources for example, was reported by one administrative respondent at SEKOMU during interview that, it was due to adoption of inclusive education in that institution. The respondent was quoted as saying;

> "…This University emphasizes inclusive set up of support services provision to students with visual impairments. Students are provided with a minimal institutional facilitation and are left themselves to interact with theirpeers and the society in general so as to get rid of their day to day academic and social challenges..." (Personal communication,14 November,2013).

Outsourcing some of the support services either was reported by some interviewee as one of the strategies adopted to combat the problem of limited human resources. Preparation of accessible tests and examinations for students with visual impairments at UDOM for example, was outsourced so that the task was done by

experts from Buigiri primary school.

Finally, in response to the question which required the respondent to site challenges which he/she faced at his/her capacity, low resourcefulness within some members of departments and units was reported as one key challenge. It was elaborated that, such members seem not to be innovative as, while they were principally regarded as human capital, capable of initiating productive ideas for the betterment of their respective units/departments, they didn't do so, but waited for the higher university authorities to solve their own challenges.

The researcher either was interested in assessing the availability of strategies in five past years to empower technical human resource only to note that, none of the four institutions had any such strategies. Data collected also indicate that, none of the institutions under the study provided any incentive package specifically to technical staff of student with visual impairment.

Moreover, data through focused group discussion was collected in order to fetch more information from students' respondents about their feeling on support services they receive from the respective institutions. The discussion was about analyzing bad and good practices done by the institution in favor of or against students with visual impairments. Among other issues which arose during the discussion, presence of a live reader of the blind was cited by the majority as one good practice. Lack or insufficiency of technical staff on the other side, was cited as one of the bad practices. Details of the focused group discussion schedule is presented in

(Appendix, VII.)

4.4 Availability and Sufficiency of Technical Resources

There were 15 types of technical resources to be surveyed by this study. They included; zoom text magnification system, closed circuit television, personal digital assistants, low vision magnifiers, Optical character recognition systems and Braille Embossers. Others included; the screen readers, electronic note takers, electronic talking dictionaries, perkins braille machines, computers with JAWS software, thermoforming machines and typewriters. Of these technical resources, the braille displays and screen readers were not available at any institution. It means only 13 varieties were at least available at one or more institutions. Table 4.5 presents details of this information. The frequencies of availability indicated in the Table, show the item was available at how many institutions. The figures do not signify 'quantity' of the items in question, but how many times the items exist. Data for quantities of items was presented separately under the sufficiency of technical resources section.

Table 4.5: Availability of Technical Resources Across Institutions nder The Study

Type of Assistive technology	Availability V = available, X = not available	Frequency of availability	Required frequency
Zoom Text screen Magnification system [ZTM]	V	1	4
Closed circuit Television [CCTV]	V	1	4
PDA's for the blind; [PDA]	V	1	4
Low vision magnifiers [LVM]	V	1	4
Optical character recognition systems [OCR]	V	1	4
Braille Embosser; [BRE]	V	3	4
Voice recognition system [VRS]	V	1	4
Braille displays [BRD]	X	0	4
Screen readers e.g. dolphin pen [SCR]	X	0	4
Electronic note taker [PEN]	V	1	4
Electronic talking dictionaries [TLD]	V	1	4
Perkins Braille machines [PBM]	V	3	4
Computer with JAWS software [PCJ]	V	2	4
Thermoforming machine [THM]	V	1	4
Typewriter [TYP]	V	2	4
Total frequency		19	60
Overall percentage of availability of Technical resource		**31.67**	

Source : field data, 2013

Sufficiency of technical resources across all institutions under the study is determined by computing the average number of available technical resource and the average number of the required technical resource per institution. This data enables one to visualize the sufficiency in % of the technical resource in the

institution under the study. Table 4.6 depicts this picture under discussion.

Table 4.6: Sufficiency (%) of the Available Average Technical Resources per Institution

Description	Technical resource														
	ZTM	CCT	PDA	LVM	OCR	BRE	VRS	BRD	SCR	PEN	TLD	PBM	PCJ	THM	TYP
Availability: V = available X = not available	V	V	V	V	X	V	V	X	X	V	V	V	V	V	V
Quantity available-Total	2	2	10	25	0	5	10	0	0	19	17	54	10	1	26
Requirement-Total	12	12	31	12	12	8	43	31	31	31	43	31	31	4	31
Available -Average TR/ institution	0.5	0.5	2.5	6.25	0	1.25	2.25	0	0	4.75	4.25	13.5	0.32	0.25	0.84
Requirement - Average TR / institution	3	3	7.75	3	3	2	0.75	7.75	7.75	7.75	10.75	7.75	7.75	1	7.75
Sufficiency in %	16.7	16.7	32.3	208.3	0	62.5	20.9	0	0	61.3	39.5	174.2	4.1	25	10.8

TR: Technical resource
Source: Field Data, 2013

One of the objective two questions for student respondents required a respondent to indicate sufficiency of each one of the following items in the university; typing papers, Braille papers, compact cassettes and dry cell for recording.. Four options were put forward which included; ‘sufficient’, ‘insufficient’, ‘not available at all’

and ‘not applicable’.

A general perspective of data collected from all institutions under the study indicated that, typing and Braille papers were sufficiently provided to students with visual impairments. This can be justified by the significant percentage (51.9% and 59.3% respectively) of respondents who chose the ‘sufficient’ option. Compact cassettes and dry cells however, seemed not to be sufficiently supplied as 48.5% and 48.1% respectively claimed that the items were not available at all. Table 4.7 shows the observations in details.

Table 4.7: Sufficiency of Typing Papers, Braille Papers, Compact Cassettes and Dry Cells to Student Respondents.

Responses Out of:	Sufficient				Insufficient				Not available at all				Not applicable			
	T	B	C	D	T	B	C	D	T	B	C	D	T	B	C	D
Tot / 27	14	16	4	5	6	8	3	4	5	1	13	13	2	2	5	3
%	51.9	59.3	14.8	18.5	22.2	29.6	11.1	14.8	18.5	3.7	48.1	48.1	7.4	7.4	18.5	11.1

T = typing papers, B = braille papers, C = compact cassettes, D = dry cells
Source: Field Data, 2013

Data was also collected through interviews held with administrative officials in order to fetch more information about issues related to technical resources. Table 4.8 presents a summary of what the interviews came up with.

Table 4.8: Data From Interviews Conducted with Administrative Officials to Address Limited Technical Resources

Question 1: How does this university manage to solicit fund needed to address special requirements?			
Responses	# of options	Frequency	
Through the Government, University, Students, donations, departments	5	1	
Through the Government, University	2	2	
Question 3: What system of funds allocation to students with disabilities is adopted by this university?			
Responses	# of stages	Average # of stages	Frequency
Treasurer--College--Castings--Cost centers--material & chemicals--target student	6	5	2
Treasurer--Recurrent expenditure--General requirement--individual student requirement--Target student	5		
Source--College--General requirement expenditure--individual student requirement	4		1
Question 4:At your capacity, what type of challenges you face in dealing with issues of students with visual impairments?			
Responses		Frequency	
Limited resources to carter for the students' requirements (budget, space)		2	

Source: Field Data, 2013

4.5 Level of Utilization of the Resources for Students with Visual Impairments

Objective three intended to examine the level of utilization of both human resources and technical resources for students with visual impairments under the study. Data for this purpose was first collected from technical or appropriate staff of each institution and then from student respondents of the respective institution. Level of utilization of the resource in consideration was examined in terms of the magnitude of the service provided to the individual through that resource.

4.5.1 Level of Utilization of Human Resources

Level of utilization of human resources was examined in terms of the magnitude of the services provided to the students with visual impairments by involving the human resources available. It is thus important to put clear first, the availability of the services in consideration.

4.5.2 Availability of Services Requiring Human Resource.

The services considered here, are in accordance to the model of accessibility services provision for student with disabilities in higher education that was described in chapter one (pp 7-8). Table 4.9 shows the support services that closely involve human resource across the institutions under the study.

Table 4.9: Availability of Services which Require Human Resource Across All institutions under the Study

Type of service	Availability V = available, X = not available	Frequency of availability	Required frequency
Services provided through human resource			
Student's needs recording service (SNRS)	V	3	4
Ability evaluation service (AES)	X	0	4
Accessible material service (AEMS)	V	4	4
Psychological counselling service (PCS)	X	0	4
Volunteerism service (VS)	V	3	4
Building accessibility service (BAS)	X	0	4
Accessible library and labs service (AL&LS)	V*	2	4
Guideline service (GS)	V	1	4
Staff/ volunteer training service (SVTS)	X	0	4
Event service (ES)	V*	1	4
Know how service (KHDS)	X	0	4
Research service (RS)	X	0	4
Total frequency		14	48
Overall percentage of availability of services			**29.17**

* V = Service limited to specific aspects.

Source: Field Data, 2013

Close observation of data from Table 4.9 indicates that, more than fifty percent of the services listed are not provided at any institution under the study. This is because, only six out of twelve services are provided at least at one of the institutions. The only service which is provided in almost all institutions under the study is accessible material service. Student's needs recording service and volunteerism services are provided at three institutions. To a lesser extent, accessible library and labs are provided at one institution while event service is provided at only one institution. Below follows is the magnitude of the services.

4.5.3 Magnitude of Services Provided through Human Resource.

The magnitude of services provided in these institutions through human resource can be viewed in the following services; the students' needs recording service, volunteerism service, accessible materials service, accessible library and labs service, guideline service and event services. Indicators of magnitude of students' needs recording service is in terms of number of cases attended per total number of cases. Data from table 4.10 indicates that at the time of this study, 36 students with visual impairments were attended through this service. This figure however incorporates only three institutions as the fourth one had no such a service. This figure constitutes 100% of the total number of cases ought to be attended within those three institutions, ignoring the fourth institution where no students recording was practiced.

Table 4.10: Magnitude of Available Services

	Magnitude of service					
	Students' needs recording service	Accessible materials service.	Volunteerism. Service	Accessible lib & labs service	Guideline service	Event service
Available tot. value / tot. required value	36/36	205/300	17/24	3/43	1/5	1/annum
Average value per institution	36	51.25	5.67	0.75	1/5	NA
Adequacy %	100	68.3	62.25	7	20	NA

NA = Not applicable, no guideline service.

Source: Field Data, 2013

The magnitude of volunteerism service is examined in terms of the number of hours spent by volunteers to provide the live reading service per the number of official working hours of the institution in question. Data from Table 4.10 indicates that the average number of hours spent in a day by these volunteers throughout the institutions is 5.67 hours. This equals to 62.25% of required magnitude. Again, one institution is excluded in this consideration as there was no recognizable volunteerism service.

Accessible material service was provided at all institutions though at a varied extent. Indicator of magnitude for this service was number of braille papers provided to a braille user in a week. Data from Table 4.10 again shows that, a total

of 205 pcs of paper were provided to the student in a week throughout all institutions. This gives an average of 51.25 pcs of papers per student in each of the four institutions. The figure constitutes 68.33% of the requirement. Accessible library and labs service was provided to a minimal extent at one of the target institutions. In this case, training to use of assistive technologies in the computer lab is specifically considered. Data from Table 4.7 indicate that a total of three computers installed with JAWS software were used for training purpose for 43 technology users across target institutions according to Table 3.1 The three computers therefore, equals to an average of 0.75 computers per institution which gives approximately 7% of the requirement.

Each of the guideline service and event service according to data collected, were provided at one different institution. Indicator of the magnitude of guideline service was the number of guideline documents available per the minimum number of the main services provided at the respective institution. Data from table 4.6 indicates that, guideline service was provided at one institution and that, only one guideline document out of the five main services provided at the institution. This was the live reading service guideline. This constituted 20% of the required magnitude of service. On the other side, an indicator of the magnitude of event service was the number of social and informal events per the total number of such events prescribed by the guideline service in a year. Data collected indicates that, only one institution had an event service practiced annually. There was no guideline service, thus making it difficult to evaluate the magnitude of the event service provided at this institution.

Data was also collected for objective three from student respondents. Among the data collected from students with visual impairments, there were five particular academic considerations. These included; Considerations during test/exams, Considerations on setting of questions, Considerations in lecture room, Considerations on features of a accessible web pages and Consideration on features of accessible technical infrastructure. The last two considerations here will be discussed under the utilization of technical resources section.

On collecting data for considerations during tests/exams, the following aspects were observed; fist, Presence of a **T**echnical **S**taff in the test/exams room to attend technical issues of the examinee, allocation of additional time to examinee, preparation of **T**ests/**E**xams in accessible formats and accessing printed tests/exams in **D**ue **T**ime to easy their preparation in appropriate accessible format.There were four options from which a respondent had to opt upon. These included; ‘sufficient’, ‘insufficient’, ‘not available at all’ and ‘not applicable’. Table 4.8, depicts the detailed picture of these data.

Table 4.11: Considerations during Tests/Exams for Students with Visual Impairments at Institutions under the Study.

Total responses per total respondents	Responses															
	Sufficient				Insufficient				Not available at all				Not applicable			
	Presence of TS	Allocation of AT	Preparation of T/E	T/E	Presence of TS	Allocation of AT	Preparation of T/E	DT	Presence of TS	Allocation of AT	Preparation of T/E	DT	Presence of TS	Allocation of AT	Preparation of T/E	DT
Total / 30	22	26	10	9	2	2	12	18	2	-	-	-	1	1	1	1
Percentage	73.3	86.7	33.3	30	6.7	6.7	40	60	6.7	-	-	-	3.3	3.3	3.3	3.3

TS = technical staff, AT = additional time, TE = tests/exams, DT = in due time

Source: Field Data, 2013

Viewing the above considerations in a general perspective, it can be noticed that, the majority of students with visual impairments agreed beyond doubt in that, allocation of additional time to examinee and the presence of a technical staff in the test/exams room to attend technical issues of the examinee were sufficient. This remark is supported by the reasonable percentages (86.7 & 73.3) of respondents who opted on the respective aspects under 'sufficient' option. Again, it can be remarked that, the majority of respondents agreed in that, the practice of accessing printed test/exams in due time to easy their preparation in appropriate accessible formats and the practice of preparation of tests/exams in accessible formats were

insufficient. This also is supported by the relatively reasonable percentages (60 & 40) of respondents who opted on the respective aspects under 'insufficient' option.

As narrated earlier, the second academic consideration out of which data was collected from students with visual impairments was consideration on setting of questions. Under this, two aspects were observed, namely; Substitution of questions which require visual perception to be attempted by those which do not, and same number of options questions to both sighted students and students with visual impairments.

Like in the former consideration, there were four options upon which respondents had to opt. These included; 'sufficient', 'insufficient', 'not available at all' and 'not applicable'. Table 4.12 shows the whole picture of the data collected from the four institutions under the study.

Table 4.12: Considerations on Setting of Questions for Students with Visual Impairments at the Institutions under the Study.

Total responses per total respondents	**Responses**							
	Sufficient		Insufficient		Not available at all		Not applicable	
	Substitution of qns	Same number of optional qns	Substitution of qns	Same number of optional qns	Substitution of qns	Same number of optional qns	Substitution of qns	Same number of optional qns
Total / 30	17	18	9	11	1	-	1	2
Percentage	56.7	60	30	36.7	3.3	-	3.3	6.7

Source: Field Data, 2013

Considering the above data in a general perspective, it can be noted that the majority of respondents had the feeling that the two aspects in consideration were sufficiently taken care of by most of examiners. This remark can be supported by the relatively high evidencing percentages of the respondents who opted on 'sufficient' option. Table 4.9 illustrates this remark.

The third academic consideration out of which data was collected from students with visual impairments was considerations in the lecture room. Under this, five aspects were observed, namely; appropriate location of a recording device, front seats to be spared for students with visual impairments, lecturer's motion relative to the position of the recording device, use of elaborative oral speech whenever using a board/an overhead, and appropriate use of words when elaborating a diagram on a board. There were five options under which a respondent was required to opt upon. These were; 'sufficient', 'insufficient', 'not available' and 'not applicable'.

A general observation in analyzing these data leads one to conclude that, the majority of respondents had the feeling that, most of the lecturers in the lecture room provided 'insufficient' attention to the aspects of 'appropriate use of word' when using a board/overhead (60%), 'use of elaborative oral speech' ((53.3%), 'lecturer's motion' relative to the position of the recording device (46.7%) and 'appropriate location' of the recording device (44.8%). The data has shown however that, the majority of these lecturers paid reasonable attention to the 'position of these learners' seats' (44.8%). This remark is supported by the relatively high percentages of respondents who opted to the said aspects under

'insufficient' and under 'sufficient' options respectively. Details of the information presented are depicted in table 4.13.

Table 4.13: Considerations in the Lecture Room for Students with Visual Impairments

Total responses per total respondents	Responses																			
	Sufficient					Insufficient					Not available					Not applicable				
	ADL	FS	LM	EOS	AUW	ADL	FS	LM	EOS	AUW	ADL	FS	LM	EOS	AUW	ADL	FS	LM	EOS	AUW
Total / 30	11	13	6	8	5	13	9	14	16	18	3	7	5	5	6	5	2	4	1	1
%	36.7	44.8	20	26.7	16.7	44.8	30	46.7	53.3	60	10	23.3	16.7	16.7	20	16.7	6.7	13.3	3.3	3.3

ADL = appropriate device location, FS = front seats, LM = lecturer's motion, EOS = elaborative oral speech, AUW = appropriate use of words

Source: Field Data, 2014

4.5.4 Level of Utilization of Technical Resource

Objective three also examined the level of utilization of technical resources for students with visual impairments. Data for this purpose was first collected from technical staff respondents and then from student respondents of the respective institution. Level of utilization of the resource in consideration was examined in terms of the magnitude of the service provided to the individual through that resource. It is thus important to put clear first, the availability of the services in consideration.

4.5.5 Availability of Services Requiring Technical Resources

Support services that closely involve the technical resource across the institutions under the study are the assistive technology services and the web accessibility evaluation service. Data collected indicate that, assistive technology service was available at three institutions and no institution had web accessibility evaluation services. The magnitude of the available services provided through technical resources is discussed in details below.

4.5.6 Magnitude of Services Provided through Technical Resources.

The level of utilization of technical resources is examined in terms of magnitude of the service provided to the individual through that resource**.** The magnitude of services provided in this respect can be viewed in the following services; Assistive technology service and web accessibility evaluation services. An indicator for the magnitude of assistive technology service is in terms of a number of users of the technology in a week per the number of entitled users. Data from Table 4.11 indicates that, out of fifteen projected varieties of technical resources, eleven are utilized at a varied extent throughout all institutions under the study. Again, percentages of adequacy which accede 50% is manifested in only four varieties of the available technical resources, which include; Braille embossers, perkins braille machines, computers installed with JAWS software, and manual typewriters. These four items constitute only 36.36% of the 11 available varieties. Therefore, it can be established that, generally, the level of utilization of the technical resources is 36.36% of the requirement.

Table 4.14: Utilization of Technical Resources

	Number of users in a week / entitled users														
	ZTM	CCT	PDA	LVM	OCR	BRE	VRS	BRD	SCR	PEN	TLD	PBM	PCJ	TYP	THM
Total values in 4 institutions	2/15	2/15	5/30	1/15		7/8	6/45	-	-	2/30	5/45	27/30	17/30	19/30	-
Adequacy in %	13.3	13.3	16.7	1/15	-	87.5	13.3	-	-	6.7	11.1	90	56.7	63.3	-

Data was also collected from students with visual impairments to address objective three of this study. There were four objective three questions and two other academic considerations posed to the student respondent during data collection. The first question required the student respondent to indicate the adequacy on support services offered by the respective university

to students with visual impairments. There were four options out of which a student respondent had to choose one. These options included; ‘adequate’, ‘less adequate’, ‘not available at all’ and ‘not applicable’.

Generally, data for this question indicates that the majority (21) of respondents from all four institutions under the study opted on ‘less adequate’ which constituted seventy percent of all respondents. For all institutions under this study, there was nobody who opted on ‘not applicable’ option. The whole picture of these data is depicted in Table 4.15.

Table 4.15: **Perception by Students with Visual Impairment on Adequacy of support services offered across all institutions under the study**.

Total responses per total respondents	**Options**			
	Adequate	Less adequate	Not available at all	Not applicable
Value / 30 respondents	7	21	2	-
%	23.3	70	6.7	-

Question two of objective three required respondents to indicate how much accessible to the respondent for each of the following assistive technologies; closed circuit television, magnifying lenses, and laptop/Computer with magnifying software. There were five options from which one had to opt upon. These included; 'fully accessible', 'accessible on demand', 'accessible on conditions', 'not available' and 'not applicable'.

General consideration of this question across all institutions under the study leads one to generalize that, the question was not applicable to the majority of respondents. Close observation however indicates that, the majority of respondents in each institution were blind. This implies that the technology in consideration was not applicable to them as it is normally useful to those with low vision. Adding to, those few who opted on other option are likely to belong to the group of students with low vision. Table 4.16 depicts the whole picture of what has been discussed shortly.

Table 4.16: Accessibility of Closed Circuit Televisions, Magnifying Lenses and Laptop Computers to Students

Total responses per total respondents	**Responses**														
	Fully accessible			Accessible on Demand			Accessible on conditions			Not available			Not applicable		
	C	M	L	C	M	L	C	M	L	C	M	L	C	M	L
Total / 30	-	5	1	-	1	-	2	-	3	6	2	4	22	22	22
Percentage	-	16.7	3.3	-	3.3	-	6.7	-	10	20	6.7	13.3	73.3	73.3	73.3

C = closed circuit television, M = magnifying lenses, L = laptop computers.
Source: Field Data, 2014

The third objective three questions required the respondent to mention a specific aspect of service provision by the respective institution that most dissatisfy him/her. There were eleven options out of which one had to opt upon. These options included; 'physical infrastructure', 'mobility aid', 'accommodation arrangements', 'provision of assistive technology', and 'live reading service'. Other options included; 'lecture presentation style', 'training in assistive technology', 'exams arrangements', 'guideline service', 'accessible library service' and 'none'.

Consideration on this question in a general perspective, leads one to argue that the majority (20%) of respondents had the feeling that the 'physical infrastructure' and the 'provision of assistive technologies' within the target institutions were the most dissatisfying service provisions. Details of the picture under consideration are depicted in Table 4.17.

Table 4.17: Specific Aspect of Service Provision by the Respective institution under the study that most dissatisfy the student with visual impairment

Total responses per total respondents	Responses										
	Physical infrastructure	Mobility aid	Accommodation	Provision of	Reading service	style	Training in assistive	Exams arrangements	Guideline service	Accessible library	None
Total / 30	6	2	4	6	4	3	1	1	1	1	1
Percentage	20	6.7	13.3	20	13.3	10	3.3	3.3	3.3	3.3	3.3

Source: Field Data, 2014

The fourth objective three questions required the respondent to mention a specific aspect of service provision by the respective university which most satisfy him/her. The same eleven options used in the third objective three questions were adopted here.

Data from Table 4.15 indicates that, the majority of respondents in the four institutions had the feeling that 'accommodation arrangement' is the most satisfying service provision at this institution. This remark is supported by the reasonable percentage (44.8) of respondents throughout all institutions who opted on this choice. The second majority (31%) opted on 'provision of assistive technology as their most satisfying practice in these universities. Table 4.18 summarizes the above presentation and analysis of data for fourth objective three questions.

Table 4.18: Specific Aspect of Service Provision by the Respective institution under the study that most satisfy the student with visual impairment.

Total responses per total respondents	Responses										
	Physical infrastructure	Mobility aid	Accommodation	Provision of	Reading service	style	Training in assistive	Exams arrangements	Guideline service	Accessible library	None
Total / 30	-	-	13	9	2	2	-	1	-	-	2
%	-	-	44.8	31	6.9	6.9	-	3.4	-	-	6.9

Source: Field Data, 2014

One of the two academic considerations formerly mentioned, out of which data was collected from students with visual impairments was considerations in features of accessible web pages. There were three aspects under this consideration namely; text/images enlargeable in favor of poor sight users, links underlined/differentiated & colored in favor of color blind users and alternative text for images in favor of all users with different needs; e.g. who require speech, Braille and symbols.

There were five options on which respondents were required to opt upon. These options included ‘very useful’, ‘useful’, ‘somehow useful’, ‘not available’ and ‘not applicable’. Table 4.19 presents data in which one could assert that, the majority of respondents from the target institutions had the feeling that the web pages contained no useful features to them particularly the aspect of ‘alternative to text for images’.

This remark is justifiable due to the high percentage (96.7) of respondents who opted onto the aspect of 'alternative to text for images' under the 'not available' option. The second majority of these respondents opted onto the aspect of 'text/images enlargeable' and 'links underlined' under the 'not applicable' option, probably because the large number of respondents were blind and could hardly comprehend visually the web pages.

Table 4.19: Usefulness of Features of Available Accessible webpages to Students with Visual Impairments

per total respondents	Responses													
	Very useful			Useful			Somehow useful			Not available			Not applicable		
	Text/images	Links underlined	Alternative	Text/images	Links underlined	Alternative	Text/images	Links underlined	Alternative	Text/images	Links underlined	Alternative	Text/images	Links underlined	Alternative
Total / 30	-	-	-	-	2	-	6	6	-	3	1	29	21	21	1
%	-	-	-	-	6.7	-	20	20	-	10	3.3	96.7	70	70	3.3

Source: Field Data, 2013

The second and last academic consideration was on features of accessible technical infrastructures. Under this consideration, the following aspects were examined; talking lifts, hand rails along stairs and bridges, pavements within inter

building/common university localities, specific markers (e.g. systems called ‘react’ which inform a blind learner about his/her location across parts of the university site, and Braille documents on notice boards.

There were five options from which respondents were supposed to opt upon. These included; ‘very useful’, ‘useful’, ‘somehow useful’ ‘not available’ and ‘not applicable.

Considering the data to be discussed shortly in a general perspective, it can be deduced that, the majority of respondents from all institutions under the study had the feeling that the aspects of the ‘hand rails and the ‘pavements’ were useful to them. They had as well a feeling that, the aspects of ‘talking lifts’ and ‘specific markers’ were not available. This remark is grounded on the fact that the said aspects led respondents to opt on the said options in high percentages. 50% and 53.3% of respondents for example opted on the option of ‘useful’ for the aspects of ‘hand rails’ and ‘pavements’ respectively. On the other side, 90% and 100% of the respondents opted on the ‘not available’ for the aspects of ‘talking lifts’ and ‘Braille documents’ respectively. Details of the information discussed are depicted in Table 4.20.

Table 4.20: Usefulness of The Features of the Accessible Technical Infrastructure to Students with Visual Impairments.

Total responses per total respondents		Responses																					
		Very useful					Useful				Somehow useful					Not available						Not applicable
		TL	HL	PM	SM	BB	TL	HL	PM	SM	BB	TL	HL	PM	SM	BB	TL	HL	PM	SM	BB	BB
Total /	30	-	3	4	-	-	-	15	16	-	-	-	10	9	-	3	27	2	1	30	22	5
%		-	10	13..3	-	-	-	50	53..3	-	-	-	33..3	30	-	10	90	6.7	3.3	100	73..3	16.7

TL = talking lifts, HL = hand rails, PM = pavements, SM = specific markers, BB = Braille on notice boards

4.6 Quality of Resources and Services

The data collected across target institutions on quality of resources and services was in terms of qualifications at different levels of education and training for the case of human resources, how timely the common used assistive technologies enabled the student with visual impairments to perform his/her routine academic work and how timely the special requirements were availed to the target student at the beginning of the academic year.

4.6.1 Quality of Human Resources

A general picture of data collected from all four institutions under the study indicate that, all the available service providers for students with visual impairments have at least Advanced level of education and the majority have under gone beyond this level. All available Transcribers for example, are first degree holders. All academic advisors available have undergone postgraduate studies at least to the second degree level. The majority of Volunteers, that is, the live readers for students with visual impairments have undergone advanced level education and few of them are first degree graduates. Table 4.21 shows a details of qualities of different human resources available in all institutions under the study.

Table 4.210: Quality of the Available Human Resources [HR] for Students with Visual Impairment in Institutions of Higher learning under this Study.

Categories of human resource in the four institutions under the study	Education, (#)		Training (#)	
	Ordinary	Advanced	Diploma / degree	Higher degree
Transcriber	-	-	5	-
Volunteer	-	43	3	-
Academic advisor	-	-	-	4
Other dedicated staff	-	-	-	1
Total	-	43	8	5
Average # of HR / institution	-	10.75	2	1.25

HR = Human resource

Source: Field Data, 2014

The average human resource per institution having advanced level education, diploma/first degree and higher degrees are 10.75, 2 and 1.25 respectively.

When asked to specify the additional training(s) required if any, one respondent transcriber claimed that further training in special needs education at degree level would be necessary for her. Another respondent transcriber from a different institution established that, training in adaptive or assistive technologies would be necessary to them. Other respondents did not show concern on this question on ground that they were uncertain of which appropriate course was important to them, or were simply satisfied with what they had.

4.6.2 Quality of Technical Resources for Student with Visual Impairments

For the sake of assessing the quality technical resources of students with visual impairments, two questions related to quality of these resources were addressed to student respondents. The first question related to quality of technical resources required the student respondent to estimate the time used to access the learning materials in braille format from one recorded lecture session. Here, there were four options namely; 1-30 minutes, 31-60 minutes, 61-120 minutes and not applicable. Data collected from all four institutions under the study indicate that, the majority of student respondent had the feeling that they required 61-120 minutes to prepare one hour recorded lecture materials into accessible format. This is evidenced by a reasonable large percentage (48.3) of those who opted on this range of time. Table 4.22 depicts the details of this information.

Table 4.22: Estimate the Time (Minutes) used to Access the Learning Materials in Braille Format from one Recorded Lecture Session

Total responses per total Respondent	**Time in minutes**			
	1-30	31-60	61-120	Not applicable
Total / 29	1	7	14	5
Percentage	3.4	24.1	48..3	34.5

Source: Field Data, 2013

The second question required the respondent to estimate the time wasted during the lecture recording process due to jams and cassette exchanges of a voice recording device. There were five options namely; 1-5minutes, 6-10 minutes, 11-15 minutes, not applicable and not applicable. Data from Table 4.23. Indicate that, relatively the majority respondents had a feeling that the question was not applicable to them as 33.3% opted onto 'not applicable' option. The second majority opted on 1-5 minutes option.

Table 4.11: Estimation of the time wasted during the lecture recording process due to jams and cassette exchanges of a voice recorder device.

Total responses per total Respondent	**Options (minutes)**				
	1-5	6-10	11-15	Not applicable	Not available
Total / 27	7	5	4	9	2
%	25.9	18.5	14.8	33.3	7.4

Source: Field Data, 2013

4.6.3 Quality of Support Services for Students with Visual Impairments

One aspect in provision of support services to students with visual impairments which indicate quality of these services is the extent by which these services are timely accomplished. Data collected for this sake was focused on how timely students with visual impairments in target institutions access their special requirement at the beginning of each academic year. There were three options namely; less than a week, 2 to 4 weeks and more than a month. General observation from data depicted in Table 4.24 indicates that, the majority of respondents had the experience of two to four weeks before their special requirements were availed to them. This comment is evidenced by the large percentage of 65.4 of those who had the said experience.

Table 4.12: Time used before students' requirement is procured at the beginning of academic year

Total responses per total Respondent	Options		
	Less than a week	2 to 4 weeks	More than a month
value / 26	6	17	3
Percentage	23.1	65.4	11.5

Source: Field Data, 2013

CHAPTER FIVE

5.0 DISCUSSIONS OF FINDINGS

In this chapter, discussion of the findings will be presented in the similar approach as in the previous chapter that is, abiding to specific objectives of the study. Discussion will thus start by discussing findings of objective one; availability of human resources. Next, discussion will focus on findings for objective two; availability and sufficiency of technical resources. Discussion of findings for objective three will follow, that is; level of utilization of human and technical resources. Finally, discussion will focus on findings of objective four; quality of human and technical resources as well as of support services.

5.1 Objective One Finding: Availability Of Human Resources

Data fromTable 4.1 reveals that, there is a big scarcity of human resource in these institutions as among the projected eight varieties of these human resources, only four varieties are at least available. There is totally no Orientation and Mobility specialist, no Assistive technology specialist, no Counsellor or Librarian for accessible library. Again, within the available human resource, no variety ever meets the requirement. Considering the Braille transcribers for example, there are five such professionals in all four institutions out of the required number of 9. This finding conforms to the findings of Ferrel, (2007:6) as cited in the literature where he asserts that, out of the requirement of 10,000 new educational personnel in visual disabilities every year, United States produces only about 250.

Examining more closely in the above cited example, if the five Transcribers were distributed equally throughout all four institutions under the study, it means that each institution would be awarded an average of 1.25 Transcribers. If the same consideration was applied to other human resources, the scarcity of human resource in this context would be clearer.

One thing to note here is that, as a matter of coincidence, the total number of volunteers in these four target institutions equals to the required number of such personnel. In reality, this does not signify that each individual institution has the required number of volunteers as at one institution for example, there lacked even a single such personnel out of the requirement of 5. Contrary to this, another institution has one volunteer out of 13 requirements. The situation arises due to lack of common guideline governing recruitment of these volunteers among the target institutions. Whereas in some institutions no volunteers are recruited at all, in other institutions the ratio of volunteer (live reader of the blind in particular) to the students with visual impairment is 1:1 or even 2:1. This implies that facilitation in studies benefits more a certain group of students with visual impairment than the other within the same education system.

In attempt to fetch more information through interviews held with administrative officials regarding shortages of human resource, emerging themes as inclusive education and outsourcing arose. The point raised was that, there was no need to employ specific technical human expertise like Transcribers or support personnel (volunteers) as the system adopted inclusive education. Inclusive education concept means to broaden educational opportunities for children with disabilities and

marginalized groups so as to realize their full potential (UNESCO, 2007). Inclusive education advocates adjustment of the system so as to accommodate special education needs by doing five basic things; re-organization of regular schools and classrooms in order to cater for a greater diversity of children's needs in the community, all children attending their local schools in regular classrooms and appropriate support, all schools restructure their curriculum/pedagogy/assessment and group arrangement to ensure access and successfor all children, involvement of parents and finally community support (UNESCO, 2007:11). These are pre conditions favorable for introduction of inclusive education system anywhere worldwide (Florian, 2007:11-12).

One would wish to ask herself about the current movement as to whether the said pre conditions have currently been achieved in the Tanzanian context and in particular at higher learning institutions to allow our students with visual impairments to access satisfactorily and equally to what their peer sighted students access within what the regular institutional curriculum intends to achieve? The current study is not there to challenge the existing movement of introducing inclusive education in Tanzania, rather it is there to examine the extent to which the student with visual impairments benefit out of the available technical and human resources, whether provided under inclusive education settings or otherwise.

In line with the inclusivity requirement of education provision which adopts the social model, the findings of this study generally have revealed that, the system in the target institutions has not been adapted adequately to accommodate special education needs. The service providers were less equipped with the appropriate

skills required to appropriately handle students with visual impairments in different academic settings. This is evidenced through student responses as depicted in different preceded Tables of results regarding the status of human resource, leave away the status of other facilities like inaccessible libraries text books, institutional websites, web pages and unfriendly campus technical infrastructures to mention a few. These features are not adequately equipped to accommodate these students.

On the other hand, the theme of outsourcing emerged. 'Outsourcing is a business strategy that moves some of an organization's functions, processes, activities and decision responsibility from within an organization to outside providers' (Patricia, 2014). The component of 'decision responsibility' here reflects the involvement of an external human resource. This practice took place at one University under the study whereby the responsibility of preparing accessible examinations scripts was outsourced. This practice has both advantages and disadvantages. Patricia, (2014) identifies five general advantages for an organization to outsource a service. These include; Cost serving, focus on core business, improved quality, customer satisfaction and operational efficiency. From this point of view, for sure, the target institution may save running costs, focus on core business of teaching and administering various institutional issues. The question of improved quality, customer satisfaction and operational efficiency however is debatable due to other factors which may influence those parameters. Patricia, (2014) also identifies eight disadvantages associated with outsourcing. These include; quality risk, quality service, language barrier, employee/public opinion and organization knowledge. Others are labor issues, legal compliance and employee layoff.

As a result of outsourcing, for example, there is a risk of getting unexpected results associated with say, quality of a service. If any technical faulty occurs during preparation of the accessible scripts for example, and this technical faulty was not discovered by the outsourced service provider, a service recipient will be a looser in the examination room if no technical expertise in the field of visual impairment is available for intervention. Satisfaction of service provision is measured through perceptions of the service recipients. Findings from this study for example have revealed that, preparations of accessible examinations were insufficient. This is evidenced through student responses as depicted in Table 4.8 in the result's chapter. Either the findings also have revealed that, generally, accessing in due time in the examination room of these accessible examinations was insufficient. With these few examples in mind, it implies that, not necessarily outsourcing of service provision may bring positive effects to the service recipient as it is the case with the current study findings.

Further findings on this study objective were on availability of human resources other than technical staff, volunteers and academic staff who operate on virtue of their technical expertise and/or their positions. It was revealed that, no other member of staff who seriously indulge themselves in serving students with visual impairments in these target institutions. This statement is justified due to the fact that, from data presented in Table 4.1, there was only one tutorial assistant at one of the universities under the study who was assigned to attend issues of students with visual impairments. She was however occupied with other regular teaching load, making it difficult for her to efficiently execute her duties to students with visual impairments.

In the model of Accessibility Services Provision for Students with Disabilities in Higher Education of which this study refers to, permanent employee in the organization structure encompasses besides technical staff, other resourceful staff not directly related to issues of disability like the electrical, Civil and Medical Engineers as well as drivers and Secretaries (Kouroupetroglou, et al., 201:7). A detail of this remark is presented in (Appendix VIII). Lack of participation of other members of staff in the support service provision to students with visual impairments has a negative implication in that, there will be delays or lack of crucial services like building or other technical accessibilities to these target scholars. Not all technical issues can be accomplished by technical staff in the accessibility unit. A team work approach is thus necessary to make support services to students with visual impairment adequate.

5.2 Objective Two Findings: Type And Sufficiency Of Technical Resources

Findings for this objective have revealed that, there are relatively limited varieties of technical resources within the target institutions ranging from totally absence to at least few of them. The list of technical resources projected included: Zoom text magnification system (ztm), Closed circuit Television (cct), Personal digital assistant (pda) low vision magnification (lvm), Optical character recognition system, (ocr), Braille embossers (bre) and Voice recognition systems (vrs). Others were: Braille displays (brd), Screen readers (scr), Pacmate electronic notetaker (pen), Talking dictionaries (tld), Braille perkins machines (bpm), Personal computer with JAWS software (pcj), Thermoforming machine (thm) and Typwriters (typ). These items totaled 15 varieties. Out of these varieties, a total of 13 varieties were

available within the target institutions but at a varying distribution.

Close observation of the available varieties of technical resources through Table 4.2 indicates that, there is no uniform distribution of these resources within the target institutions. Two items for example, that are, braille embossers and perkins braille machinesexist at three institutions. Braille displays and screen readers do not exist at any of the institutions under the study. Computers and typewriters exist at two institutions while the rest do not exist at any of the target institutions. Based on Table 4.2, comparing the total frequency of availability of technical resources across all target institutions to the required frequency gives the overall percentage of availability of the technical resource. The findings revealed that, the overall % of availability of technical resources across all target institutions is 31.7%. Literature acknowledges these findings when UNESCO, (2006:21) contends that: 'despite the progress, special education provision in Tanzania faces the following problems: lack of specialized equipment and teaching/learning materials…'. This small percentage is an alarming indicator that something have to done in order to alleviate the situation bearing in mind that, at the level of higher institution learning, technical resources like the listed ones are very essential to the individual with visual challenges.

Back to sufficiency of the available technical resources,findings revealed that technical resources within all target institutions are not sufficient. Analysis of the findings through Table 4.3 makes it clear that, sufficiency of availability for 11 out of 15 listed technical resources is below 40% of the requirement. Only four items are above 40% of the requirement. These include: low vision magnification systems

(LVM), Braille embossers (BRE), Pac mate electronic note taker (PEN) and Perkins braille machines (PBM).

Findings on this research question were further strengthened by students' responses when interviewed about the sufficiency of typing papers, braille papers, compact cassettes and dry cells. About half of the respondents alleged that the compact cassettes and dry cells, which are purely components of technical resources were either insufficient or not available at all. However, relatively the majority of respondents agreed generally that supplies such as typing paper and braille papers were sufficient. This comment is evidenced by the reasonable percentages (51.9%-59.3%) of respondents who opted on sufficiency option for these supplies as indicated in Table 4.4. The study carried out by Booker, Obert, & Arthur, (n.d), in Zimbabwe higher learning institutions revealed that, the majority of the lecturers (80%) were of the idea that provision of learning materials was not enough for student with disabilities.

Similarly, in attempt to fetch more information related to this issue of shortages of technical resources, the researcher carried on an interview with administrative officials across target institutions, trying to investigate whether shortages were related to system of funds acquisition adopted by the respective institutions. The findings from this interview revealed generally that, the major sources of funds needed by these institutions were the government and universities themselves. Other sources were also noted by some institutions which include; donations from good wishers, student's personal funding and departmental/unit initiatives.

The fund's resource allocation system was another researcher's concern as he needed to trace the stages involved prior to funds reachingthe beneficiaries. By definition, 'The resource allocation system (RAS) is the set of policies and procedures that the Fund uses to channel the resources it receives from various sources to projects or programmes to meet the strategic objectives of the Fund' (Muller, 2013). In this case, the findings through these interviews revealed that, principally almost all institutions had funds allocation systems bearing an average number of 5 stages. The majority of these interviewee either, had a common feeling in that, limited resources (budget and space in particular) to carter for the students' requirements was one major challenge to their capacities.

With the above findings from the said interview in mind, it is clear that most institutions depend only on the government and on institution own initiatives to solicit funds needed to address special requirements for target students. That is a good move, but there is a need to improve policies and strategic plans within target institutions so as to enhance morediversifications of fundsolicitation for the target learners. This is due to the fact that, special requirements for these learners are relatively more costly than for the rest scholars(Hanushek, et al.1998:30).

The system of funds allocation either, needs to be reviewed so as to shorten the bureaucracy and thus let the special requirement be availed in due time to students with visual impairments.Navigar Consulting, (September 2009:4) in her article entitled, Efficient Grant Allocation and Control: A Navigar Consulting white Paper, contends that, 'One organization surveyed spent 4 days on average to process a

grant change. When one considers that an organization processes thousands of these grant changes, the time required multiplies exponentially'. Business rules are necessary to ensure that the funding is spent as it was directed to and proper reporting is provided back, but special consideration and intervention for sensitive issues of learners with visual challenges is equally important to ensure that they access their special requirements in due time and thereof cope well with their studies.

5.3 Objective Three Findings: Level of Utilization of Human ond Technical Resources

Level of utilization of the specified resource is examined in term of the magnitude of service provided through that resource. Level of utilization of human resource therefore is examined via the magnitude of services provided through human resource.

5.3.1 Findings for the Level of Utilization of Human Resource.

Generally, the findings through this study have revealed that, more than 50% of the listed services are not provided at the respective institutions (Table 4.6:56). These include; Ability evaluation service (AES), Psychological counseling (PCS), Building accessibility service (BAS), Staff and Volunteerism training service (SVTS), Know how dissemination service (KHDS) and Research service (RS) to a very lesser extent however, user training for assistive technologies (PAT) took place at some institutions. The findings through Table 4.6 dictate that, among the services provided, the students' needs recording service, volunteerism service, accessible educational materials service, accessible library and labs service, guideline service

and event services are considered as their execution is through human resource. According to these findings as depicted in Table 4.7, the magnitude of students needs recording service is 100%. Volunteerism service operated at 62.25% of the requirement level, accessible materials services at 68.33%, accessible library and labs service operated at 7% while guideline service at 20%. The magnitude of the event service was not clear as no prescribed guideline service was available to give the criterion to compute the percentage. Tables 4.6 and 4.7 have displayed a short form of this presentation.

The picture portrayed by these findings is inadequate as, out of the six highlighted available services, only three met expectations of the service recipients. This again constituted 50% of the provided services. In addition to that, there were other factors which needed to be examined in connection to the services provided. These factors included; number of institutions involved in computing the percentage, ratio of service provider to service recipient and consistence in service provision within the scheduled time frame. Only three institutions were involved in this exercise as at one of the target universities, no highlighted services were provided. The ratio of Volunteer to Student at another university was very insufficient as it was 1:11 which means that, though a live reader was there, but the load was heavyand unmanageable to him. Literature in this respect gives a different experience when it assert; 'Volunteers are also used extensively at some universities. The University of Alberta, Canada for example, uses 300 volunteers to help 200 students with disabilities. York University in Canada has a similar volunteer program' (Aune, 1993 as cited by Perkins, 2001). The event service which was only conducted

annually at SEKOMU was not under taken consistently. One respondent, a dedicated member of staff at that university during interview was quoted as saying:

> "Ok, to my memory, a disability day was conducted twice ever since I joined this University. The first time was in 2009 when I was pursuing my undergraduate studies and the second time was in 2011 when I was already member of staff". (Personal communication, 15 November,2013).

The above findings with the subsequent examination of other factors suggest that the observed findings may not have any significant impact to the learning process of an individual student with visual impairments.

Data for study objective three were also collected from student respondents. When interviewed on their perceptions on sufficiency of different academic considerations by the respective institutions, most student respondents had the following in mind;

> First, the presence of a technical staff in the examination room and allocation of additional time is normally sufficient.
>
> Second, preparation of accessible examination and accessing it in due time is insufficient
>
> Third, appropriately setting of examination questions is sufficient.
>
> Fourth, appropriate location of a recording device in relation to position or motion of the lecturer during presentation is insufficient.
>
> Fifth, elaboration of what is written on a board and appropriate use of elaborative word is insufficient.

Seventh, prioritization of front seats for students with visual challenges is sufficient

These observations are supported by the relatively high percentages of respondents who opted on either ‘sufficient’ or ‘insufficient’ option. Tables 4.8, 4.9 and 4.10 presented details of data discussed here.

Finally, data was collected from the student respondents to seek their general perception on adequacy of support services offered across all institutions under the study, only to learn that the majority had the feeling that, support services offered are less adequate. This was supported by the large percentage (70) of those who opted on the option of ‘less adequate’. Table 4.12 shows details of this information. Again, when required to cite one the specific service provision by the respective institution that the respondent feels to berelatively most satisfying and one which is most dissatisfying, the majority had the feeling that; the physical infrastructure and assistive technology provisions together are equally most dissatisfying. The residential accommodation on the other side was cited by the majority as the most satisfying service provision. Tables 4.14 and 4.15 have the details of the information presented here.

5.3.2 Findings For The Level Of Utilization Of Technicalresources

The findings through this research question dictated that, assistive technology service and Web accessibility service are considered as their execution is through technical resources. General observation of these findings through Table 4.11 indicates that, out of the 15 items listed, 11 are utilized throughout the target institutions under the study but at a varied extent. This constitutes 73% of the listed

items. The level of utilization of these technical resources in a week per entitled user however, varied ranging from 6.7% (PEN) to 90% (PBM). The items whose utilization percentage accedes 50 in this list are only four, that is, the BRE (87.5%), PBM (90%), PCJ (56.7%) and TYP (63.7). Percentagewise, these four items constituted 36.4% of the 11 utilized ones. This implies that, only 36.4% of the available technical resources in the listwere adequately utilized throughout all institutions under the study.

The discussion to this point has covered only the listed items under Table 4.11. Considering utilization of the technical infrastructures, it was noticed instantly that, usefulness of the available institutional technical infrastructures such as: accessible web pages, talking lifts, handrails, pavements and specific markers were also examined through student respondents. Findings from these features indicated that; in all institutions there were lack of accessible web pages, lack of talking lifts and lack of specific markers at all. The big percentages of those who opted on either 'not available' (in alternative text for image 96.7%, talking lifts 90% and specific markers 100%) or 'not applicable option' (in text image enlargeable and links underlined both 70%) justify this assertion. About 50% of these respondents however, acknowledged that handrails and pavements existing in these institutions were useful to them. Literature also has supported this observation when Jameel (2008) argues that; 'One of the three components of the Higher Education for Persons with Special Needs (Persons with disability) (HEPSN) 1999- 2000 was to; improve the accessibility of these institutions by making their infrastructure and architecture more disabled-friendly'. This implies that, the technical infrastructures

were insufficiently established and thus needed improvement.

Finally, there was one more objective three question which required a student respondent to indicate how much accessible to the respondent for each of the following assistive technologies; closed circuit television, magnifying lenses, and laptop computer with magnifying software. Findings from this question revealed that, the majority students had the feeling that the technical resources were not applicable to them. This assertion is supported by the relatively large percentage (73.3%) of those who opted on 'not applicable' option. This finding however, might have been attributed by the fact that, the majority of respondents were braille users while the technical resources in question were mainly useful to large font users (students with low vision). Demographic information presented earlier (Table 3.2) has shown that the total number of braille users who participated in this study were 22 while the rest were large font users.

5.4 Objective Four Findings: Quality of Human and Technical Resources and Support Services

Objective four findings were tied up into three parts namely: findings for quality of human resources, quality of technical resources and quality of support services.

5.4.1 Finding for Quality of Human Resources

Findings through Table 4.18 revealed that, at least all the human resources available within the target institutions had a minimum level of Advanced Education. The rest had undergone further trainings at different higher levels and in different programs. Most of the volunteers were found only in human resources section who exercised

their responsibilities within this level of education. The average number per institution of these volunteers was 10.75. This is a reasonable number for this category of human resource bearing in mind that, this study dealt with a total number of 30 students with visual impairments throughout the four institutions under the study. If this figure of service recipients is distributed equally across the four institutions, the 10.75 volunteers would thus serve an average of 7.5 students with visual impairments. By this, the volunteer to student ratio was at 1.43:1 (Table 4.18:72).

Appropriate level of education however, is one among many factors which renders one to efficiently perform her/his duties. Case loads, Incentive packages, appropriate working environment, availability of appropriate technical resources to mention a few, are among crucial elements to make one perform his/her duties in more an effective way. Findings too revealed that there was uneven distribution of the human resources among the target institutions. Either, no incentive packages to technical staff were provided to any of the target institutions. These factors together with others to be discussed shortly suggested that, the findings drawn on this research question alone could not adequately address the problem under the study.

Another aspect examined for quality of human resources was the level of trainings. Findings revealed that, each institution has an average of approximately one Braille Transcriber and one Volunteer who had a diploma or first degree. The findings also revealed that each institution had an average of one academic advisor who hada postgraduate degree. The requirement for these human resources according to literature however, is such that for the Braille Transcriber, a condition was

certification by the National Library Service for the Blind and Physically Handicapped' (SEFI, 2014). The national Examination Council of Tanzania – NECTA, is responsible for awarding a similar certificate to Braille Transcribers and Volunteers while the respective institution of higher learning does the same for Academic advisors.

Maybe one thing of interest regarding quality of these professionals is that, presence of a correct human resource with the correct qualification is one thing. Adequacy of these human resources and sustainability of these qualities is something different but very vital. Ferrel, (2007:6) contends that, 'when so few new teachers are produced; teacher quality becomes less of an issue than quantity'. The theme of this study is availability and adequacy, and on this context, adequacy has been referred to as the presence in due time, of appropriate and sufficient resources (Princeton University, 2012). The words 'appropriate and sufficient' here have respectively a sense of 'quality and quantity of a resource' in it. These are two interdependent variables. One can hardly talk of quality alone to reflect sufficiency without considering quantity and vice versa. Appropriate quality alone of human resources in the situation of insufficient human resources therefore, won't reflect adequacy of the resource in question.

5.4.2 Findings for Quality of Technical Resources

Tables 4.19 and 4.20 presented data for quality of technical resources. The first question related to quality of technical resources required the student respondent to estimate the time used to access the learning materials in braille format from one recorded lecture session. Findings on this objective, revealed that the majority of

respondents cited that they required 61-120 minutes to prepare one hour recorded lecture materials into accessible format. This assertion is justified by the large percentage (48.3) of those who opted on this range of time.

Similar results from a focused group discussion occurred when members of the discussion agreed that they normally spent approximately two hours in organizing recorded lecture notes from a single lecture session.

If two hours are required to organize recorded lecture notes from a single, one hour lecture session, how about if the learner has managed to attend at least three lecture sessions a day and recorded them all? He/she will definitely require a total of six hours to organize these recorded lecture notes in accessible format. It means that, this student with visual impairment will spend a total of six hours a day dealing with only one subject matter. During this time, his/her colleague, that is a sighted student who equally attended the three lecture sessions will have ample time to digest the summary notes which he/she simultaneously organized during the lecture sessions. This wasted time is a disadvantage to the student with visual impairment which definitely is attributed by the low quality of the recording device. Use of low quality voice recorders which require tapes at the present digitalized world is improper. There are many more advanced technologies which can save valuable time of the student with visual impairment. For example, Coard, (2002); Philips, (2007) as cited byHussin, 2013:17) contend that ‘As advances in technology improved, these developed into electronic books (e-books) and digital talking textbooks’. Nowadays there are also electronic note takers, e.g. pac mate omni,

which an individual with visual impairment can use in lecture session to electronically organize her/his notes directly in braille format and thus save time.

Student respondents were also required to estimate the time wasted during the lecture recording process due to jams and tapes exchanges of a voice recorder device. Findings have revealed that relatively, the majority of these respondents were of the feeling that, the question was not applicable to them. This assertion is grounded on the fact that a relatively large percentage (33.3) of those who had the feeling of ‘not applicable’. The second majority (25.9%) however felt that, they wasted 1-5 minutes due to jams and other interruptions during the recording process.

Close observation from the data indicates that there is in fact no significant majority in any of the options. Explanation for this is twofold. Firstly, the situation might be attributed by the fact that, student respondents had different past experience in use of a recording device. To some respondents for example, it might havebeen their first time to use the device as they had not used it at lower levels of education. Some might have used it since when they were at lower levels and thus have more experience. Some might have applied guesswork as they had no any experience on the device at all. Secondly, some respondents reported that they did use digital recording devices, not analog ones which require tapes to record. With these dispersed data bearing insignificant majority, one can hardly make reasonable inferences on the quality of technical resources across target institutions.

5.4.3 Findings for Quality of Support Services

Major features of a quality support service according to Guideline and Standards, (2014:47) and Waterfield, & West, (2005) include; existence of a thoroughly identification by service providers of learners with special learning needs and their special needs, involvement of qualified professionals, participatory approach in service provision, a well-coordinated approach in service provision and provision of appropriate support services.

Findings from this study have revealed that, the quality of support services is low. This comment is grounded on the fact that across all institution under the study, there were no guideline service or policy document to direct specifically what to be done even in universities where technical staff like Transcribers existed. There was no participatory approach so that professionals in the special unit were regarded in some cases as responsible for everything pertaining students with visual impairments. 'Most importantly, support services to students with disabilities, where they do exist, tend to operate separately from or have limited collaboration with broader teaching and learning support initiatives at the institutions' (DMS, pp. 24-25).Provision is more or less an ad-hoc response to the needs raised by the students rather than being a systematic and pro-active in approach (Hadjikakou, and Hartas, 2007).

Quality of support services was also examined in terms of how timely the provisions where they exist are accomplished across all institutions under the study. When interviewed to seek their perceptions on how long it took for the procurement

of their special equipment and supplies to be accomplished at the beginning of academic year, the majority student respondents cited that, two to four weeks were used. The relatively large percentage (65.4) of those who opted on that range of time evidences the assertion. Table 4.21 depicts the detailed information of this observation. This is an alarming situation, since at that time, studies are supposed to have already started; however, students with visual impairments persisted waiting tirelessly for writing equipment, recording device and supplies! Perkins, (2001:9) quotes one university student when asked; 'Were these services provided in a timely manner?' as saying; 'No. I have had to constantly annoy people and complain to countless others in order to get many things accomplished'.

CHAPTER SIX

6.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In the preceding chapter discussion of the findings of the study has been reported. Chapter six consists of a summary of the findings, conclusions based on the findings and recommendations of the study.

6.1 Summary of the Findings

The purpose of this study was to analyze the availability and adequacy of support services including technologies to students with visual impairments in Tanzania institutions of higher learning. Presentation of the summary will adopt the same style as that adopted in the preceding chapter.

6.1.1 Objective One Findings: Availability of Human Resources

The findings on the availability of human resources revealed that, there is a big scarcity of human resources dedicated for students with visual impairments across all target institutions. Among the projected eight varieties of these human resources, only four are at least available. These include; Braille transcribers, Volunteers, academic advisors and other dedicated staff. Either, no variety of the available human resource ever meets the requirement and that; the available human resource is unevenly distributed across target institutions. Emerging issues of inclusivity of education and outsourcing were manifested in some institutions as an alternative way of combating the problem of shortage of human resources in those institutions. Finally, the findings revealed that, the service providers were less equipped with the

appropriate skills required to handle students with visual impairments in different academic settings.

6.1.2 Objective two Findings: Types and Sufficiency of Technical Resources

The major findings on the types and sufficiency of technical resources have revealed that, there are relatively limited varieties of technical resources within the target institutions, ranging from totally absence to at least few of them as, out of the 15 projected varieties, there were a total of 13 varieties available within the target institutions but at a varying distribution.

The overall % of availability of technical resources across all target institutions is 31.7 (Table 4.2:51). This % reflects availability of varieties, not quantity of the items themselves. The overall sufficiency across all target institutions is 40% (Table 4.3:52). Compact cassettes and dry cells, which are purely components of technical resources, were either insufficient or not available at all. Major sources of funds needed by these institutions to carter for students' special requirements were the government and universities themselves. All institutions had funds allocation systems bearing an average number of 5 stages prior to funds reaching the beneficiaries.

6.1.3 Objective Three Findings: Level of Utilization of Human and Technical Resources

For the level of utilization of human resources, the findings revealed that, more than 50% of the listed services are not provided at the respective institutions. The level of utilization of human resources across all institutions also was50%(Tables 4.6 &

4.7:56-57). Provisions of services in some institutions were influenced by other factors such as unmanageable caseloads, and inconsistence of service provisions within those institutions. According to service recipients' perception;

First, the presence of a technical staff in the examination room and allocation of additional time was normally sufficient.

Second, preparation of accessible examination and accessing it in due time was insufficient

Third, appropriately setting of examination questions was sufficient.

Fourth, appropriate location of a recording device in relation to position or motion of the lecturer during presentation was insufficient.

Fifth, elaboration of what is written on a board and appropriate use of elaborative word was insufficient.

Six, prioritization of front seats for students with visual challenges was sufficient

Seven, generally, the support services offered by the respective institutions were 'less adequate'.

For the level of utilization of technical resources, the findings revealed that, 73% of the listed technical resources were utilized throughout the target institutions but at a varied extent (Table 4.11:64).The level of utilization of the available technical resources across all target institutions was 36.4% (discussion section 5.3.2). The technical infrastructures such as; accessible web pages, talking lifts and specific markers were not available across all target institutions. The handrails and pavements which existed were useful to student respondents.

6.1.4 Objective Four Findings: Quality of Human and Technical Resources Support Services

For the quality of human resources, the major findings revealed that, at least all the human resources available within the target institutions have a minimum level of advanced education. Most of these human resources have undergone further training at different higher levels and in different programs. There was uneven distribution of the available human resources across target institutions. Each institution has an average of approximately one braille transcriber and one volunteer who has undergone training at the level of diploma or first degree, and that each institution has one academic advisor who has undergone training at the level of postgraduate degree.

For the quality of technical resources, the major findings revealed that, the respondents required 61-120 minutes to prepare a one hour recorded lecture materials into accessible format. This consumed them much of their valuable study time because they used low quality devices for lecture recording.

For the quality of support services, the major findings revealed that, the quality of support services was low as across all target institutions, the criteria for quality support services were not met; no guideline document / policy, no participatory approach, unclear coordination to mention a few. The support services were not timely provided as the respondents' special requirement and supplies were availed to them at the beginning of the academic year after 2-4 weeks.

6.2 Conclusions Based on the Findings

In view of the current study on the Analysis of the availability and adequacy of support services to students with visual impairments in Tanzania institutions of higher learning, the following issues emerged;

First, there is a great scarcity of human and technical resources within the higher learning institutions that accommodate students with visual impairments in Tanzania.

Second, the human and technical resources available in the target institutions are unevenly distributed, so that in some, there are substantially adequate such resources while in others there is none.

Third, the support services are inadequately and unevenly available across all target institutions

Fourth, the level of utilization of human resources across all target institutions was 50%

Fifth, the level of utilization of the available technical resources is 36.4%. as illustrated in Table 4.11 and discussed in section 5.3.2

Six, there is no unifying guideline document across target institutions which could specifically give direction on how to provide support services to learners with visual impairments at higher learning institutions.

Seven, parallel to lack of a guideline document mentioned earlier, some institutions seem to implement inclusive education although the preconditions for the approach do not warrant the inclusivity.

Eight, the service providers were less equipped with the appropriate skills required to handle students with visual impairments in different academic

settings

Nine, at least all the human resources available within the target institutions have a minimum level of advanced education.

Tenth, each institution has an average of approximately one braille transcriber and one volunteer who has undergone training at the level of diploma or first degree, and that each institution has one academic advisor who has undergone training at the level of postgraduate degree.

Eleventh, the quality of support services was low as across all target institutions, the criteria for quality support services were not met; no guideline document /policy, no participatory approach, unclear coordination to mention a few.

Twelfth, in reflection to the statement of the problem under this research and the findings thereof, students with visual impairments across all institutions under the study have a general feeling that, the support services they receive are inadequate. They however acknowledge that, the following specific provisions were provided satisfactorily. These include; residential accommodation arrangements, appropriate setting of examination questions, prioritization of front seats in lecture room, presence of handrails and pavements within the institutions.

6.3 Recommendations of the Study

In the light of the study findings, conclusion and the limitations of the study, the following recommendations are made for administrative action and for further research.

6.3.1 Recommendations for Administrative Actions

The findings of this study have significant implications to administrators and policy makers both at national and institutional levels. The following are recommendations to administrators and policy makers at national and institutional levels.

Establishment of a standard guiding document to address specific disability issues. Findings from this study have revealed that, there is no unified way of handling issues of students with visual impairments across all institutions under the study. It is recommended that a standard guiding document be established which will address specific disability issues pertaining student with visual impairments in higher learning institutions. This guideline document will address among other things the following key issues which emerged from the current study findings;

First, allocation of adequate resources that will carter for provision of support services to students with visual impairments.

Second, introduction of public awareness programs associated with special learning needs of students with visual impairments in all universities.

Third, improvement of campus infrastructures to enhance accessibility to buildings, libraries, websites and Web Pages.

Fourth, proactive as contrary to reactive approach in settling of issues well known in advance, like procurements of special requirements for learners with visual impairments.

Fifth, diversification of the system of funds solicitation to carter for special learning needs of students with visual impairments in higher learning institutions in order to address the deficit of resources.

Six, encouragement of participatory approach in support services provision within and across target institutions to enable both technical and non-technical staff to be involved in support services provision.

6.3.2 Recommendations for Lecturers

The findings from this study have shown that, there is limited awareness among Lecturers on how to appropriately accommodate learners with visual impairments in the different academic settings, e.g. lecture room or in the assessment procedures. It is thus recommended that,a Lecturer should;

Take initiative to know the presence of a student with visual impairments. A lecturer should take initiative to know the presence in her/his lecture room of any student with special needs (visual impairments in this study context) and the nature of a special need the student has.

Be prepared to address the student's special needs. A Lecturer should be prepared to address the student's special need as much as possible and where the lecturer

fails to acknowledge how the special need can be addressed, he/she may take initiative at convenience to share the matter with the expertise in the special unit.

6.3.3 Recommendations for System Administrators

The findings have reveals that there was no any accessible websites or web pages in any of the surveyed institutions. It is recommended that the system administrators have to consider including accessible infrastructures whenever designing websites and webpages. It is quite possible to do this as a number of helpful links are available on line. For more details about how a system administrator can go along in designing websites and webpages, refer appendix VIII.

6.3.4 Suggestions for Further Research

The purpose of this study was to investigate the availability and adequacy of support services including technologies to students with visual impairments in Tanzania higher learning institutions. Many significant findings resulted from the examination of the data collected. The findings, although significant, had some limitations. One limitation was lack of adequate information required by a researcher. Another limitation was the scope of the study. The study was limited to analysis of availability and adequacy of appropriate resources. The researcher could not determine the influence of these variables to the student's achievement. Either the, research could not go into details of the emerging themes, inclusivity in particular, in order to examine the rationale of its adoption in the Tanzania current educational system.

In the first instance, basing on the above limitations, objective four of this study addressed quality of a human resource as a component of adequacy (p.10). It was noted that, besides education, there are other factors such as caseloads, incentives and working conditions which influence performance of an individual. Further research could be on the impact of motivation to performance of the service provider of students with visual impairments in higher learning institutions or impact of quality to performance of the service provider of student with visual impairments in higher learning institutions.

Second, further researches related to objective two may be the influence of fund raising systems to adequacy of technical resources of University students with visual impairments. Future research also could be on the relationship between students satisfaction in a specific service provision to academic performance. Finally, empirical research could be done in connection to whether inclusive education has brought any significant impact to academic achievement of students with visual impairments to date since when it was established in Tanzania.

REFERENCES

Access Media Group, (2014). The eye chart and 20/20 vision, all about vision. [http://www.allaboutvision.com/eye-test/] site visited on 10/8/ 2014.

American Foundation for the Blind [AFB], (2000). Survey on the Training and Availability of Braille Transcribers. Expanding Possibilities for People with Vision Loss. Louisville, Kentucky. 11 October, 2000. 26pp.

American Foundation for the Blind. (2006).*Assistive Technology*. NY:American Foundation for the Blind,

American Foundation for the Blind [AFB], (2011).“Educating Students With Visual Impairments for Inclusion in Society” A paper on the inclusion of Students withVisualimpairments.[http://www.afb.org/info/programs-and-Services/professional-development/teachers/inclusive-education/1235] site visited on 26/9/2003.

Answers Corporation, (2012).“Technical staff-definition”, http://wiki.answers.com /Q/What_is_the_definition_of_technical_staff site visited on 10/1/2013.

Black, T. R. (1999). “Doing quantitative research in the social sciences: An integrated approach to research design, measurement, and statistics”. Thousand Oaks: CA: SAGE Publications, Inc.

Blankenship K. E., (2004).*Looking for success: Transition planning for students with visual impairments in the state of Iowa.*Unpublished Dissertation Submitted to the Faculty of the Graduate School of Vanderbilt University in partial fulfillment of the requirement for the degree of PhDin Special Education. Nashville: Tennessee. 226pp.

Booker M., Obert M., and Arthur M., (n.d).“A survey of Challenges, opportunities and threats faced by students with disabilities in the post-independent era

in Zimbabwe, University of Zimbabwe Resource Centre". 42pp. [http://www.kubatana.net /docs/edutra/sstchallengesstudentsdisabilities110214.pdf]site visited on 15/10/2011

Burton, M., Knipe, C., Midtdal, V., Rathwell, D. & Wong, F., (2010). *Reading strategies for Students with Visual Impairments: A Classroom Teacher'sguide.* British Columbia: Special Education Technology-British Columbia.

Candidate Number: 490196, (2009). Magnitude and causes of childhood blindness and severe visual impairment in sekoru district of Jimma zone, south west Ethiopia. London: School of Hygiene &Tropical Medicine. 70pp.

Cohen, L; Manion, L.M; and Morris, K. (2000).*Research Methods in Education*(6th Edition). London: Routledge farmers. 657pp.

Colenbrander, A., (1999).*Guide for the Evaluation of Visual Impairment*, Published though the Pacific Vision Foundation, San Francisco for presentation at the International Low Vision Conference VISION-99: International Society for Low vision Research and Rehabilitation.

Colenbrander, A., (April, 2002).*Visual Standads: Aspects and Ranges of Vision loss with Emphasis onPopulation SurveysReport*.Sydney: International Council of Ophthalmology.

Corn A.L. and Spungin A.J. (2003).*Free and Appropriate Public Education and the Personnel Crisis for Students With Visual Impairments and Blindness*,(COPSSE Document No. IB-10). Gainesveille, FL:University of Florida, Center on Personnel Studies in Special Education.29pp.

Correspondent, (2011, March14). Assistive technologies widen participation of students with visual impairment in education. The Guardian, IPPmediacom. [http://www.ippmedia.com/frontend/index.php?l=27017] site visited on 9/2/2012

Cheifetz, C. & Haenga, T. (n. d.) An educators guide to visual disabilities and technology use. http://education.illinois.edu/wp/netfiles.uiuc.edu/tpearl2 /www/visual%20 disabilitieshtm?uniq=scvjye] site visited on 12/7/2014.

Department of Education, (2009).“Support Services For Students With Disabilities At South African Higher Education Institutions”. Republic of South Africa. Author. [http://web.uct.ac.za/depts/disability] site visited on 3/7/2014.

Department of Social Development/Department of Women, Children and People with Disabilities/UNICEF. (2012). *Children with disabilities in South Africa: A situation analysis: 2001-2011. Executive summary.* Pretoria: Author.

Disability management Services[DMS], (2011).“*Disability in higher education” : Project Report for Foundation for Tertiary Institutions of the Northern Metropolis- FOTIM.*(conducted 2009-2011). Retrieved from the university of Cape Town website: https://www.uct.ac.za/usr/disability/reports/annual_ report_10_11.pdf.

Eliot Associates, (2005).“Guidelines for conducting a focus group”. [http://assessment.aas.duke.edu/documents/How_to_Conduct_a_Focus_Gr oup.pdf] site visited on 2/7/2013.

Evaluation Toolbox, (2010).“Semistructured interview, community sustainability Engagement”.[http://evaluationtoolbox.net.au/index.php?option=com content&view=article&id=31&Itemid=137]site visited on 6/2/2013.

Evans, J.M., (2006*). Standards for Visual acuity: A report prepared for Elena Messina intelligent systems division national institute for standards and technology*(in support of ASTM international task group E54.08.01). On performance measures for robots for urban search and rescue. Newtown, CT: KT Consulting.

Ferrell K., (2007), *Issues in the field of Blindness and Low-Vision,*North Carolina. National center on severe and sensory disabilities.

Fraenkel, J. and Wallen, N. (2000). *How to design and evaluate research in education.* London: Routledge, Von Hoffmann press.

Hadjikakou, K. and Hartas, D. (2007).*Higher Education provision for students with disabilities in Cyprus.* Cyprus:University of Warwick.

Hanushek E. A., Kain J. F., & Rivkin S. G., (1998). *Does special education raise academic achievement for students with disabilities?*:(NBER Working Paper 6690). Cambridge, MA 2138: National Bureau of economic research.

Harrison, M. etal, (2009).*Evaluation of Provision and Support for Disabled Students in Higher Education:*a Report to HEFCE and HEFCW by the Centre for Disability Studies and School of Sociology and Social Policy at the University of Leeds.

Houghton Mifflin (Eds.), (2009). *The American Heritage Dictionary of English language*.Boston: Houghton Mifflin company.

Hricko, M. (2000, September). Designing accessible Web-based courses. *Indian Journal of Open Learning, 9* (3):393-401.

Humplick, F., Paterson, W.D.O.,& The world Bank, (1994). Framework of performance indicators for managing road infrastructure and pavements:*3rd*

international Conference on Managing pavements (pp. 123-133). Retrieved from; http://pavementmanagement.org/ICMPfiles/1994005.pdf.

Hussin A., (2013).*Experiences of students with visual impairments in adoption of digital talking books: an interpretive phenomenological analysis (Unpublished Doctoral dissertation).* Colorado State University. Fort Collins, Colorado.

International Society for Low vision Research and Rehabilitation [ISLVRR], (1999).*Guide for the Evaluation of Visual Impairment.* San Francisco: Pacific Vision

Jameel, S. S. (2008).*Disability in the context of higher education: Issues and concerns in India, financial assistance.* New Delhi: India 110016, National University of Educational Planning and Administration.

Koganuramath, M. M. & Choukimath, P.A., (2009*).Learning Resource Centre for the Visually Impaired Students in the Universities to Foster Inclusive Education*. Mumbai India. ICAL-2009 Library services. pp. 619-625.

Kouroupetroglou G., Pino A. and Kacorri H., (2011).*A Model of Accessibility services Provision for students with Disabilities in Higher Education*. (International Conference BRNO 8-11). Athens: Kapodistrian University of Athens.

Lusekelo, M. (2009). *The impact of teachers shortage on the internal efficiency of primary schools in the remote areas of Ileje and Mbeya rural districts in Tanzania (Unpublished masters Dissertation).* Dar es salaam, University of Dar es salaam 136pp.

Maguire, D. & Matejka, M. (1999).*On-line delivery: A model for successful implementation.* A paper presented to AARE-NZARE Conference 1999Melbourne, Australia. 16pp.

Maswanya, L.M., (2007, May). "Disabled people and MDGs in Tanzania": Paper presented atthe Workshop held in Bratislava 15-17 May 2007.

Merriam-Webster, Incorporated[MWI], (2014).*Anencyclopaedia:* Britain: Britinnica Company.

Ministry of Education [ME], (2008). Reading Strategies for Students with Visual *Impairments: A Classroom Teacher's Guide,* Special education Technology British Columbia. Author.

Mnyanyi, C.B.F., Bakari, J. and Mbwete, T.S.A., (n.d).*Implementing e-learning i n higher open and distance learning institutions in developing countries: The experience of the open University of Tanzania.* Dar es salaam: The Open University of Tanzania.

Mole, H. (n.d.).*Services of disabled students in US higher education: implementing a social model approach*. The Department of Sociology and Social Policy, Leeds: The University of Leeds.

Msuyablogspot, (2009, April 2). Special Education in Tanzania: present situation on special education in Tanzania. Retrieved from; [http://msuyablogspot.blogspot.com/] site visited on 26 September 2013.

Muller, B., (4 October 2013). "On resource allocation systems: Comments in response"to GCF/B.05/05 (30 September 2013), London: The Oxford institute for Energy Studies.

Naidoo, P. (2005).*"A study of the academic needs of students with visual impairments at the University of Kwazulu-natal, Westville campus:support*

services ineducation and training in South Africa.(Unpublished master's thesis). Kwazulu Natal: University of Kwazulu-Natal.200pp.

Navigar Consulting, LLC, (September 2009).*Efficient Grant Allocation and Control: A navigar Consulting White Paper*. Retrieved from Navigar consulting website:[www.navigarconsulting.com]. site visited on 20 July 2014.

Ndume V. Tilya, F.N. & Twaakyondo, H. (2008). Challenges of adaptive elearning at higher learning institutions: A case study in Tanzania. *International Journal of Computing and ICT Research, 2*, (1): 47 - 59.

Omari, I.M. (2011).*Concepts and methods in educational research: "a practical guide based on experience"*. Dar es salaam. Oxford University Press (T) ltd.

Opie, C. (Ed.). (2007).*Doing educational research.*, London**:** Sage Publications.

Patricia, (2014). Smart church Management: Advantages and disadvantages of Outsourcing[http://smartchurchmanagement.com/advantages-and-disadvantages-

of-outsourcing/] site visited on 5/8/2014.

Perkins, R. (2 April 2001). Provision of services for students with visual impairments: A case study. *Information Technology and Disabilities Journal*,*vii*(2)1-12.

Phrasisombath, K. (2009). *Basics of writing a research proposal: Geneva foundation for* medical *education and research training course* [Power point slides].Vientiane, Laos: University of Health Sciences, Faculty of Postgraduate studies and Research.

Princeton University, (2012). Farlex clipart collection. [http://www.thefreedictionary.com/nontechnical] site visited on 10/1/2013.

Rukundo, E. (2010). Availing More with the Opportunity to access University Education. People Living With Disabilities sponsorship scheme. Weinformers: Platform for Uganda news and information, to inform & engage. [http://www.weinformers.net/2010/03/26/availing-more-with-the-opportunity-to-access-university-education/] site visited on 9/9/2014.

Sandelowski, M. (20002).*Combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-method studies*, Chapel Hill: University of North Carolina.

Scheuren, F. (2004).*What is a survey*[Power point slides].Alexandria, VA 22314-1943: American statistical Association.

Seidman, I.E. (1991).*Interviewing as qualitative research:* A guide for researches in education and social sciences. New York: Teachers College Press.

Shipp, A.E., (2008). Disability documentation criteria for students with learning disabilities in higher education. A dissertation for award of the degree of doctor of education. Auburn, Alabama. 148pp.

Stufflebeam, D.L.,& Mckee, B. (10/03/2003).An update, a review of the model's development and a checklist to guide implementation In *the CIPP model for evaluation*: Presented at the 2003 Annual Conference of the Oregon Program Evaluators Network (OPEN).Portland, Oregon: Western Michigan university. 68pp.

Tahir, T. (2010, April 6). Funding delays hit disabled students, *The Guardian* [http://www.guardian.co.uk/education/2010/apr/06/disabled-students-allowance delays#history-link-box] site visited on 14/10/2011.

TCU, (2009 October). *Rolling Strategic Plan 2009/10- 2013/14.* Dar es salaam:URT.

Teaching strategies for students that are blind, (n.d.). "Teaching Strategies for Students That are Blind and Low Vision: To Unlock the Door of Learning all you Need is a key" [Handout]. Valencia, Spain: Office for students with Disabilities[http://valenciacollege.edu/osd/documents/BlindnessDraft.pdf] site visited on 8/7/2014.

Texas Education Agency (January 2014). Educating students with visual impairments in Texas: Guidelines and standards. Texas: Texas Education Agency, 2014. 57pp [www.tsbvi.edu] site visited on 10/7/2014.

UNDP, (2000).*Tanzania Human Development Report: The state of Progress in Human Resource Development 1999.* Dar es salaam: Author.

Shodor Education Foundation [SEF], (2014).*BRL: Braille through remote Learning. Braille transcriber course*[Handout]. Retrieved from Braille through Remote Learning website: http://www.brl.org/ transcribers/session01/ pro.html.

UNESCO, (1995).*Review of the present situation in special needs education.* NY: UNESCO.

UNESCO, (2007).*IBE-UNESCO Preparatory report for the 48th ICE on Inclusive education.23-27 July, 2007*. Nairobi, Kenya: IBE-UNESCO.

UNESCO, (2009).*Teaching Children with Disabilities in Inclusive Settings.* Bangkok 10110, Author.

URT, (2006).*National Policy on Disability*. Dar es Salaam: Ministry of Labour, Youth Development And Sports. 34pp.

URT, (2006 September) "World data on education, 6th ed. compiled by UNESCO-IBE".[(http:/www.ibe.unesco.org/] site visited on 13/2/2012.

Yin, R.K., (2009). *Case study research, design and methods*(4thEdition). London: SAGE Publications Inc. 240pp.

Webfinance, (2013). 'Support services' definition. [http://www.businessdictionary.com/definition/support- service.html]site visited on20/5/2013.

World Health Organization-[WHO], (June, 2008).*Service Delivery: Toolkit on monitoring health systems strengthening service delivery.* [http://www.who.int/healthinfo/ statistics/toolkit_hss / EN_PDF_ Toolkit_HSS_ServiceDelivery.pdf. site visited on 26/9/2013.

Zabala, J. S., (2004).Development and evaluation of quality indicators for assistive technology services. A dissertation for award of the degree of Doctor of Education at the University of Kentucky. Lexington, Kentucky.363pp.

APPENDICES

Appendix 1: Indicators of Adequacy of Support Services.

DIMENSION	ASPECT TO BE EXAMINED	INDICATOR OF ADEQUACY
Availability of human Resources	Braille Transcribers O & M specialists AT specialists Live readers of the blind	Staff : Student ratio # of staff with recommended qualification/tot. # of dedicated staff
Availability of technical resources	Perkins Braille Machines Voice recorder Typewriter White cane Low vision magnifiers CCTVs Mini guide obstacle detector Electronic talking dictionaries Electronic note taker Embosser	Item to user ratio available % of the required # of items # of items/Single student with VI
	Accessible Computer lab	# of accessible computers/# of students with visual imp.
	Accessible Library	# of varieties of Braille books available/# of recommended varieties text books available Braille books available : blind student ratio
	Technical infrastructure Accessible web pages Handrails, pavements and specific markers	Accessible links % of the available # of useful links Presence of features at least in key premises Like; libraries, lecture rooms and admin blocks.
Utilization	Accessible materials	# of papers/entitled # of pprs-

of Human resource (Services)	production	student-week
	Live reading	Av. # of pages/day # of hrs spent/day(hrs)
	Tutoring on use of AT	# of qualified/# of trainee-yr # of trainee/# of VI students # of trainings/wk
	Public awareness initiatives Fliers/brochures Seminars, Workshops etc. Mass media outputs	# of seminars, workshops etc./# prescribed -academic yr.
	Teaching learning strategies Sitting arrangement Use of T/L. aids Lesson presentation style Qn. Formulation Tests/exams arrangements Electronic note taking	comment of a service recipient on adequacy of a service
Utilization of Technical resources (Services)	Voice recording	Comments on adequacy-users' perspective Average time consumed to access recorded lecture materials into braille format from a single lecture session
	Use of low vision devices	# of users in a year/total # of entitled users
	Usefulness of technical infrastructures	Comment on usefulness- user's perspective
	Reading & organizing the files Embossing saved notes	# of users in a week/tot # of entitled users Comments on adequacy - student's perspective

APPENDI 2: APPENDIX II: CHECKLIST FOR OBJECTIVE 1:

INSTITUTION: _____RESPONDENT: TECHNICAL STAFF: (1st, 2nd…)

_____

DISIGNATION: _____EMPLOYED IN THIS INSTITUTION IN (YEAR)

_____

OBJECTIVE: 1; AVAILABILITY AND QUALITY OF HUMAN RESOURCE

…..PAGE 1:

AVAILABILITY OF STRATEGIES IN 5 PAST YEARS TO EMPOWER HUMAN RESOURCE	**DURATION OF TRAINING/STUDY TOUR (IN WEEKS) TICK (✓) WHERE APPLICABLE**				
	None	**1- 4**	**5 - 12**	**13 - 24**	**Above 24**
Training in Transcriber profession					
Training in Orientation and Mobility Profession [O&M].					
Training in assistive technology [AT]					
Training in accessible library and labs					
Training in Guidance and Counseling for learners with disability (visual impairment in particular)					
Training in volunteerism (in live reading for the blind)					
Study tours to specific localities – worldwide					
Incentive packages (if any) allocated by this University to technical staff of students with visual impairments.	…… …… ……				

APPENDI 3: APPENDIX III: CHECK LIST FOR OBJECTIVE 2:

RESPONDENT: TECHNICAL STAFF: _____DISIGNATION _____

EMPLOYED IN THIS INSTITUTION IN (YEAR) _____

OBJECTIVE 2: TYPES AND SUFFICIENCY OF THE AVAILABLE TECHNICAL RESOURCES.

S/No	Nature of Technical resource (Assistive Technology)	Availability Tick (✓)	Quantity (# / requirement)
1	Zoom Text screen Magnification system		
2	Closed circuit Television [CCTV]		
3	PDA's for the blind; e.g. Bookworm		
4	Low vision magnifiers		
5	Optical character recognition systems; e.g. Cicero text reader		
6	Braille Embosser; e.g. index basic D.		
7	Voice recognition system		
8	Braille displays; e.g. a braille wave		
9	Screen readers e.g. dolphin pen		
10	Electronic note taker e.g. Pac mate Omni		
11	Electronic talking dictionaries		
12	Perkins Braille Machines		
13			
14			
In the space provided below, List down any other useful technical resources (if available but not listed above). Fill in the respective columns accordingly.			
15			
16			

APPENDI 4: APPENDIX IV: CHECK LIST FOR OBJECTIVE 3:

RESPONDENT: TECHNICAL STAFF: (1st, 2nd etc.) _____ DISIGNATION _____EMPLOYED IN THIS INSTITUTION IN (YEAR) _____

Services to be offered to students with visual impairments	**Availability Tick (V)**	**Magnitude of service**		**Utilization of:**
		(Indicator parameter)	**# / $\#_{t,m}$**	
Students' needs recording service [SNRS]		# of cases attended / total $\#_t$ of cases		HR
Evaluation of current student abilities service [AES]		# of cases assessed / total $\#_t$ of entitled cases		HR
Personal Assistive technologies Service [PATS]		1. # of users in a wk / total $\#_t$ of entitled users 2. # of trainee in a wk / $\#_t$ of entitled trainees	Refer next pg.	1. TR 2. HR
Accessible educational material service [AEMS]		Av # of transcribed Braille papers / student - week		TR
Psychological Counseling service [PCS]		# of cases attended/wk		HR
Volunteerism service[VS]		# of hrs spent / total $\#_t$ of official hrs		HR
Building accessibility service [BAS]		User's comment on the usefulness of the facility	Refer next pg.	TR
Accessible libraries and Labs service [AL & LS}		Av # of AL & LS users / wk-hrs		TR
Guidelines service [GS]		# of guideline documents available / $\#_m$ of main services provided		HR

Staff and Volunteers training service [SVTS]		1. # of trainees / total $\#_t$ of dedicated staff-yr 2. # of trainees / total $\#_t$ of volunteers-yr	1. ___ 2. ___	HR
Web Accessibilitm4y Evaluation service [WAES]		Av # of days accessed accessible pages / wk		TR
Events service [SES]		# of social and informal events / $\#_t$ of such events prescribed by GS section- year		HR
Know how Dissemination service [KHDS]		# of workshops, seminars and conferences in the domain of accessibility / year		HR
Research service [RS]		# of ongoing educational research projects on visual impairment issues within past three years		HR

OBJECTIVE 3: LEVEL OF UTILIZATION OF STANDARD TECHNICAL (TR) AND HUMAN RESOURCES (HR).

PG1

NOTE: 1 $\#_t$ = Total number $\#_m$ = Minimum

NOTE: 2 This chart provides support services as per the disability unit of the University of Athens taken to be a standard service provision model for this study.

OBJECTIVE 3. (Continuation – Technical staff respondent) … PAGE 2

SPECIFICATION	**VALUE**			
OBJECTIVE 2: TYPES AND SUFFICIENCY OF THE AVAILABLE TECHNICAL RESOURCES				
Time used before students' requirement is Procured at the beginning of academic year	Less than a week	2 -4 weeks	More than a month	
		V		
Tick /rewrite where applicable for each of the following supplies: Typing paper ……... Braille paper …… Compact cassettes …….. Dry cells for recording …….	Very Sufficient	Sufficient	Not available at all	Not applicable
OBJECTIVE 3: LEVEL O F UTILIZATION OF TECHNICAL (TR) AND HUMAN RESOURCES (HR)				
Tick /rewrite where applicable to indicate adequacy on support services offered by this University to students with visual impairments:	Adequate	Less adequate	Not available at all.	Not applicable
Indicate how much accessible to you for each of the following Assistive technologies; Closed circuit Television (CCTV) Magnifying lenses Laptop /Computer with magnifying software	Fully accessible (FA)	Accessible on demand (AD)	Accessible on conditions (AC)	Not applicable
Mention specific aspect of service				

provision by this university that most dissatisfy you	
Mention specific aspect of service provision by this university that most satisfy you	

APPENDIX 5: APPENDIX V: CHECK LIST FOR OBJECTIVE 2-3 (FOR STUDENT RESPONDENTS)

PROGRAM _____ YEAR OF STUDY (1ST, 2ND etc.) _____

Nature of Technical resource (Assistive Technology)	**# of users in a week**	**# of trainee in a week**	**Total # of entitled users/trainee**
Zoom Text screen Magnification system			
Closed circuit Television [CCTV]			
PDA's for the blind; e.g. Bookworm			
Low vision magnifiers			
Optical character recognition systems; e.g. Cicero text reader			
Braille Embosser; e.g. index basic D.			
Voice recognition system			
Braille displays; e.g. a Braille wave			
Screen readers e.g. dolphin pen			
Electronic note taker e.g. Pac mate Omni			
Electronic talking dictionaries			
Perkins Braille Machines			
In the space provided below, List down any other useful technical resources (if available but not listed above). Fill in the respective columns accordingly.			

OBJECTIVE 3. RESPONDENT: STUDENT (1st, 2nd, …) ___ PAGE 2

CONSIDERATIONS DURING TEST/EXAMS	**SUFFICIENCY TICK ( )√WHERE APPLICABLE**			
	Sufficient	Insufficient	Not available	Not applicable
Presence of a technical staff in the test/exams room to attend technical issues of the examinee				
Allocation of additional time to examinee				
Preparation of tests/exams in accessible formats				
Accessing printed tests/exams in due time to easy their preparation in appropriate accessible format				
CONSIDERATION ON SETTING OF QUESTIONS	Sufficient	Insufficient	Not available	Not applicable
Substitution of questions which require visual perception to be attempted by those which do not				
Same number of optional question to both sighted students and students with visual impairments				
CONSIDERATIONS IN THE LECTURE ROOM	Sufficient	Insufficient	Not available	Not applicable
Appropriate location of the recording device for the learner with visual impairment				
Front seats to be prioritized for students with visual impairments				
A lecturer not to move too far from the recording device of the learner with visual impairment during presentation				
Use of elaborative oral speech to every bit of information put on a board/overhead during presentation				
Appropriate use of words when elaborating a diagram on a board to avoid gaps in the mind of a blind learner				

OBJECTIVE 3. RESPONDENT: STUDENT (1st, 2nd …) ___ PAGE 3

FEATURES OF ACCESSIBLE WEBPAGES (IF AVAILABLE)	**USEFULNESS TICK (V) WHERE APPLICABLE**				
	Very useful	**Useful**	**Some how useful**	**Not available**	**Not applicable**
Text/images enlargeable in favor of poor sight users					
Links underlined/differentiated & coloreds in favor of color blind users					
*Alternative text for images in favor of all users with different needs; e.g. who require speech, Braille, symbol, etc.					
FEATURES OF ACCESSIBLE TECHNICAL INFRASTRUCTURE	**Very useful**	**Useful**	**Some how useful**	**Not available**	**Not applicable**
Talking lifts					
Hand rails along stairs and bridges					
Pavements within inter buildings/common university localities					
Specific markers (e.g. systems called ‘react’ which inform a blind learner about his/her location across parts of the university site.					
Braille documents on notice boards					

APPENDIX 6:: CHECK LIST FOR STUDENT'S NECESSARY PERSONAL PARTICULARS

Student's S/NO.	PROGRAM OF STUDY	YEAR OF STUDY	CATEGORY OF VISION PROBLEM (tick where applicable)			TRAINING(S) IN ASSISTIVE TECHNOLOGY EVER UNDERGONE
			Low vision	Blindness	Multi – disability (specify)	
1						
2						
3						
Etc.						

NAME OF INSTITUTION UNDER THIS RESEARCH: _____

DATE _____

APPENDIX 7: APPENDIX VII: FOCUSED GROUP DISCUSSIONS CONDUCTED FOR STUDENT RESPONDENTS: GUIDING

Questions and Summary of General results

The major topic of discussion was 'Availability and Adequacy of support services'.

The discussion was guided by the following questions:

1. (a) What are the good practices done by this University which you think indicate that it cares for your special learning needs?

   (b) How do you rank the suggested practices in (a) above?

2. (a) What practices done by this University which you think to be bad and thus need to be reviewed so as to address your special learning needs?

   (b) How do you rank the suggested practices in (a) above?

3. In terms of time consumption, how useful you think is your recording device in the learning process at this Institution?

APPENDIX 8: **VIII: A PORTION OF THE ACCESSIBILITY SERVICES' MODEL FOR STUDENTS WITH**

Disabilities in Higher Education

LEARNING DESIGN

INTERNATIONAL CONFERENCE | BRNO 8–11 FEBRUARY 2011

A Model of Accessibility Services Provision for Students with Disabilities in Higher Education

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Keywords: Design for All, Individual Accommodation, Accessibility Service, Universal Learning Design, Tertiary Education, Assistive Technologies, Accessibility, Educational Facilities

2 Accessibility Services' Model

The basic requirements of the students with disabilities include:

- access to interpersonal communication with the members of the academic community,
- access to the structured environment of the university,
- access to the printed or electronic educational material,
- access to the board and the presentations in the classrooms,
- access to the exams/tests, and
- access to the information and the WWW content.

The proposed accessibility services provision model follows a student-oriented approach. It is based on the requirements' analysis of the students with disabilities during their studies. Moreover, this model influences their academic environment and the accessibility policy inside and outside the educational institution. The main pillar of this model is the "Accessibility Unit" which provides a number of supportive services, arranged in a three-tier architecture according to their "proximity" to the student: (i) accessibility services addressed directly to the student, (ii) accessibility services applied to the student's environment, and (iii) accessibility promoting services. Figure 1 presents a general overview of these logical layers (tiers) of the model, along with their services that are described in the next sections.

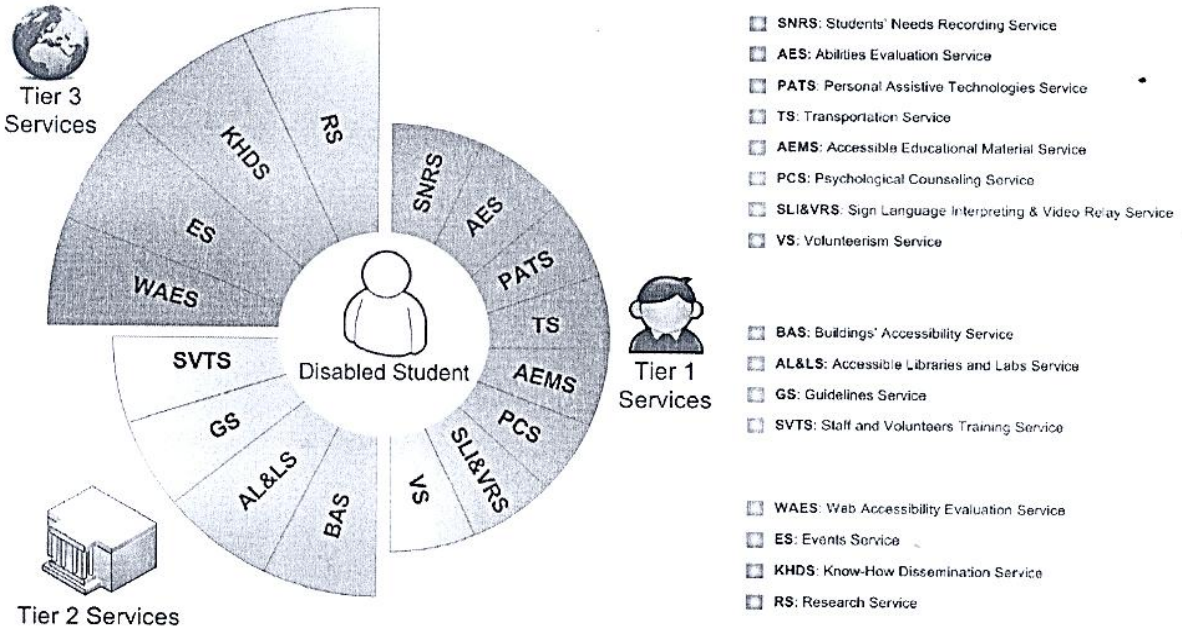

Figure 1. Accessibility services provision model architecture for students with disabilities.

3 Implementation

The proposed model was applied on the Accessibility Unit of the University of Athens in Hellas. The University of Athens has 98.675 undergraduate students, 2.128 professors, 2.536 employees, and 34 faculties. The Accessibility Unit was officially founded in 2006.

3.1 Organization

The University of Athens Accessibility Unit includes four departments, namely, a) Electronic Accessibility (e-access), b) Structured Environment Accessibility, c) Transportation, and d) Psychological Counseling. We mostly focus on the e-access department for three reasons: firstly, we believe that access to computers and electronic information sources like the World Wide Web and digital books is the most important tool for successfully and efficiently study in a higher education institution nowadays, secondly because ICT and AT are the strongest means of overcoming one's disability especially in the educational environment, and thirdly because we head towards computerizing most of the services the Accessibility Unit provides. By "computerizing" we mean the use of innovative service-supportive information systems and computer applications, which we develop in order to facilitate, monitor, speed up, and optimize each service.

Figure 3 presents the "Accessibility Unit" section, the organization described above, and the services as they are distributed to its departments. The permanent personnel that is currently employed in our Accessibility Unit (totally 12 persons) includes: in the e-access department one Electrical Engineer with an MSc in IT and one Computer scientist, both specialized in accessibility, one Digital Document Technician, one Sign Language Interpreter, and one Sociologist for supporting the VS; in the Structured Environment Accessibility department one Civil Engineer and one Mechanical Engineer, both boarded in the University's Technical Services offices for practical reasons; in Transportation department we have 3 drivers (and 2 specially modified Vans) and one secretary; finally, one Clinical Psychologist works in the Psychological Counseling department of the Unit.

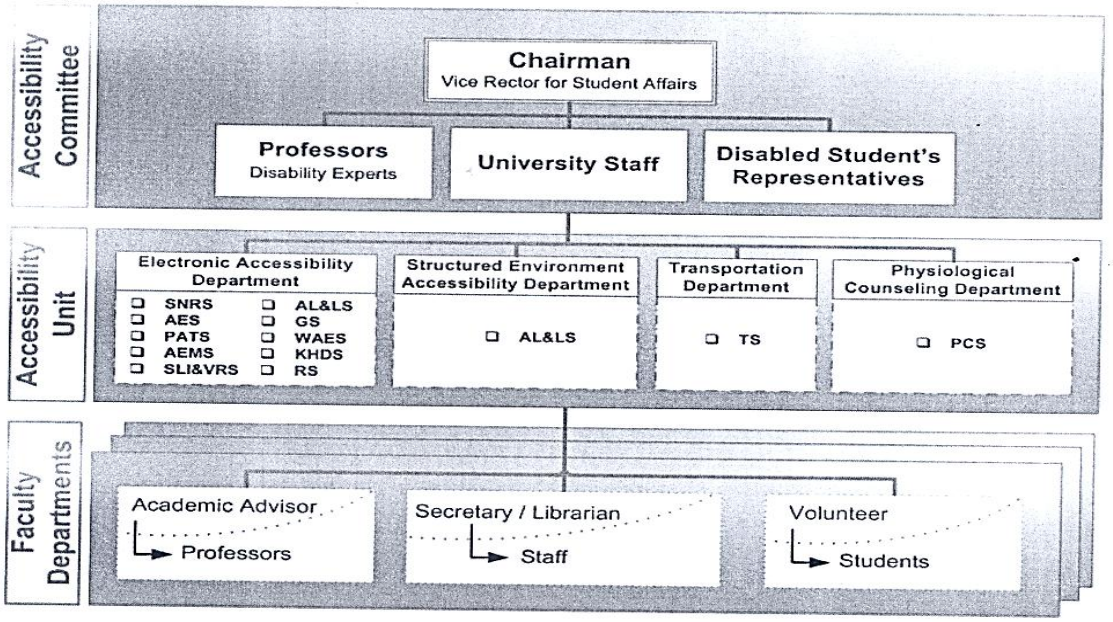

Figure 3. Organization and Management of the University of Athens' Accessibility Unit.

3.2 Management

The Accessibility Unit was founded after a formal decision of the Academic Senate and was introduced in the University's organization chart as an autonomous entity which comes directly under the Vice Rector for Student Affairs. There is also a supervisory Committee for Students with Disabilities, with 10 members, which comprises besides the Vice-Rector, three professors with expertise on Accessible Computing, Special Education, and Psychology respectively, the head of the Students' Club, a representative of the Technical Services of the University and three delegate students appointed by their National Associations of the Disabled, namely one visually impaired, one motion impaired and one hearing impaired student.

APPENDIX 9: USEFUL LINKS AS GUIDELINES IN PREPARATION OF ACCESSIBLE TECHNICAL

Infrastructures

http://en.wikipedia.org/wiki/Web_accessibility

http://www.w3.org/standards/webdesign/accessibility

http://trace.wisc.edu/docs/adaag_only/adaag.htm

APPENDIX 10 : GUIDELINE SERVICE DOCUMENT FOR LIVE READERS FOR THE BLIND AT UDSM

UNIVERSITY OF DAR ES SALAAM

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY AND CURRICULUM STUDIES

THE SPECIAL EDUCATION UNIT

GUIDELINES FOR READERS /NOTE TAKERS

After extended reflection on the problems experienced in coordination of activities of Readers for the blind, the Unit staff and the coordinator for the special unit services from the Department of Educational Psychology met and agreed on the following guidelines;

1. *A Reader/Note taker will be confirmed by the special Unit only if he/she fulfilled conditions for recruitment which involve; being nominated in writing by the student concerned and applying in writing for the post.

2. Once a student is allocated Readers/Note takers, he/she will arrange reading/note taking time ensuring that he/she does not exceed the 7 hours per day allocated to her/him.

3. Once a student is allocated Readers/Note takers, he/she will be allowed to get a service for the whole semester without changing the service provider.

4. Any disputes or differences not settled by the two parties will be communicated to the special unit Management for more mediation measures.

5. The office will keep records **as reported by a blind student only on attendance and performance of Readers.** This record will be used by the office to check accurateness of Readers' claims at the end of the month.

6. Claims for payment will be addressed to the Dean -School of Education under forward signatures of the Head Dept of Educational Psychology, Coordinator Special unit and the Head Special Unit.

7. The first day of a SEMESTER, will mark the first day of each month. This will be a guide to when a reader/note taker should prepare his/her monthly claims. Claims by a Reader/Note taker recruited at a later stage after commencement of a semester however, will be considered as from the date of his/her recruitment.

8. For the sake of this semester, all Claims must reach the special unit and the coordinator's office not later than _____ of each month.

9. No payment claims will be processed if not checked by the Special Education Unit.

10. A Reader/Note taker is supposed to seek for job description from the special unit before he/she starts to provide the service to his/her client.

11. All readers must agree to the condition that if they are discovered to have frauds in their claims or deviate from the regulations stated above, they will be terminated without any other warning.

12. All readers must sign the agreement on the next page at the beginning of the Contract.

_____

Dr Mary Mboya

Coordinator, Special Education Unit